

# The Relationship between Video Games and Aggressive Behaviour

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## Abstract

There has been a spark for psychologists in the relationship between video games and aggressive behaviour. Several studies explore this issue, which this article aims to explore through the research question, “Does exposure to violent video games affect aggressive behaviour?” The research question will be investigated using the General Aggression Model (GAM). The article also discusses the biological and environmental factors contributing to aggressive behaviour.

Keywords: Video Games, GAM, Aggression, Cognition, Behaviour

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## 1. Introduction

Have you ever wondered why you get mad with a particular object or person? Have never considered why you act the way you do in some scenarios. Now, you may think, what is aggressive behaviour, and what influences such behaviour during adolescence? In this article, the extent of the influence of violent video games on aggressive behaviour will be explored. Aggression in social psychology is a behaviour that aims to harm any person, animal, or physical property. Several aggressive acts include physical violence, shouting, swearing, gossiping to hurt others, asserting dominance over another, or breaking an object (Juby, 2019). Aggressive acts can even lead to murder (reference). One of the possibilities of this behaviour emerging is due to violent video games that influence us daily (Anderson & Bushman, 2001). The challenge for the current generation is that many teenagers have access to and permission to buy and play video games. 90% of teenagers are unsupervised when playing video games (Walsh, 2000, mentioned in Anderson & Bushman, 2001). The authors have shown that the repeated practice of violent video games has taught teenagers aggressive attitudes and beliefs leading up to aggressive behaviours. In addition, the authors state that prosocial behaviour is decreased by such activity. This means that teenagers will be more likely to be less social, possibly leading to problems in their future lives, such as anxiety.

### 1.1 Definitions

A video game is “an electronic game in which players control images on a video screen” (Video Game Definition & Meaning, 2023). Video games were first introduced in 1970 as tennis games. Since then, over the years, video games have been constantly evolving. In 1990, the first few violent video games were introduced. These games were *Mortal Kombat*, *Street Fighter*, and *Wolfenstein 3D*. The objective of these games was to kill or hurt other players. The games included projections of blood and sounds such as screaming players. By the year 2000, violent video games were much more widespread and were still evolving. Buchman & Funk (1996, referenced in Anderson & Bushman, 2001) found that 59% of fourth-grade girls and 73% of boys considered violent video games to be their favorite type of game. The addiction to video games in Japan has increased over time. Hasegawa (2022, referenced in Japan Times) displayed that 17% of young Japanese kids from ages 6 - 12 play at least four hours of video games weekly. This has been a 9% jump compared to the base year 2017. Even for people of older age, video game addiction may be a severe problem. For instance, Takahisa Masuda, a 46-year-old individual, stated, “I had thought about killing myself, but I wanted to finish

Dragon Quest". In Japan, there has been a debate for law enforcement; however, it has not come true yet as a way to potentially reduce the problem of addictions.

It is understood that human behaviour has multiple origins. For example, there is an ongoing debate about nature vs. nurture. This dichotomy describes the characteristics of an individual gained either from nature, which are the biological factors (genetics), or nurture, which refers to the environmental factors, including how and who the individual grew up with (Nature Vs. Nurture: Understanding Aggression | Psychology Paper Example, 2022). In terms of genetics, each individual has specific genes in the brain, such as MAOA, DAT1, and DRS2, which can affect neurotransmitter levels, influencing functions such as mood, memory, and intelligence (Garcia, 2015). Neurotransmitters are chemical messengers sent throughout the body to regulate bodily functions from heart rate to appetite (Han, n.d.). This can change how people react to certain scenarios, for example, aggression. In addition, aggression can be altered from person to person depending on hormone levels, such as testosterone, which influence the function of the amygdala. The amygdala is a part of the brain and is known as the emotional center located on each side of the temporal lobe and is a part of the limbic system. High testosterone levels will lead to a higher stress response in the amygdala, causing a higher release of adrenaline and cortisol, increasing an individual's motivation to deal with a threat and potentially leading to higher aggressive and violent acts. Thus, testosterone levels correlate with aggression levels. Other than the biological factors, there are social factors such as traumatic experiences, parental teachings, and media. These factors are measured in studies using devices such as magnetic resonance imaging (MRI) or functional magnetic resonance imaging (fMRI). These two technologies can map the brain, where the MRI can scan the structure and size of the brain, while the fMRI can project which part of the brain is active when conducting something on a screen. With all these possibilities, it could be suggested that video games are an environmental factor influencing aggression.

## 2. Discussion

Many aspects of aggressive behaviour can be explained by the General Aggression Model (GAM), which was initially proposed by Anderson & Bushman in a meta-analysis in 2001. Aggression levels are determined by both "situation" and "difference" factors, including an individual's traits and attitudes. Factors like access to violent video games or guns are situational variables. GAM suggests that these variables influence aggressive behaviour through three routes: "cognition," "affect," and "arousal." "Cognition" involves increased aggressive thoughts and scripts, "affect" relates to emotional responses, and "arousal" refers to changes in physiology. When these routes are altered, one's behaviour

can change accordingly (Anderson & Bushman 2001, referenced in Science Direct & Benjamin Jr, 2023). These variables can be altered by such input variables as playing violent video games (situational) and hostility traits (difference). The GAM in Figure 1 explains the process of nature and nurture that affects one's aggressive behaviour, and Figure 2 explains the process of the GAM with violent video games and aggression.

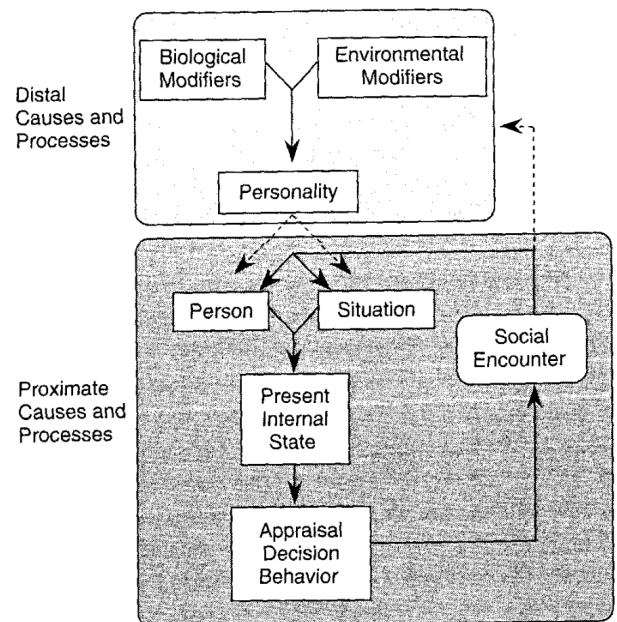


Figure 1: The General Aggression Model: Single-Cycle and Distal Processes (Anderson et al., 2004)

### 2.1 Anderson & Bushman, 2001

Anderson and Bushman's meta-analysis in 2001 aimed to understand how playing violent video games affects aggressive behaviour, aggressive cognition, aggressive emotion, physiological arousal, and prosocial behaviour. A meta-analysis is a process of combining several studies to present a conclusion and more consistent results. Four thousand two hundred sixty-two participants were included in the study as the researchers gathered 35 research reports, each including 54 independent participant samples. In total, 54% of the participants in this meta-analysis were over 18, while 46% were under 18. The researchers in their research chose the studies conducted using criteria. The main criteria for the studies had to examine the influence of playing violent video games on aggressive cognition, aggressive affect, aggressive behaviour, physiological arousal, or prosocial behaviour.

Furthermore, the studies with other participants watching others play the video game were excluded as a result would be collapsed due to “watch manipulation” as they could not estimate the effect of “playing” participants. The researchers used a correlation coefficient to determine the relationship between aggressive behaviour and violent video games after gathering the data. The correlation between violent video games and aggressive behaviour, prosocial behaviour, aggressive cognition, aggressive affect, and arousal was shown in this study using bar graphs and whisker plots. Figure 3 puts each finding into the 25th, 50th, and 70th percentiles. From the study's graph and findings, aggressive behaviour, aggressive cognition, aggressive affect, and arousal are usually positively correlated with playing violent video games. The study also reveals a negative correlation between playing violent video games and being helpful (prosocial behaviour).

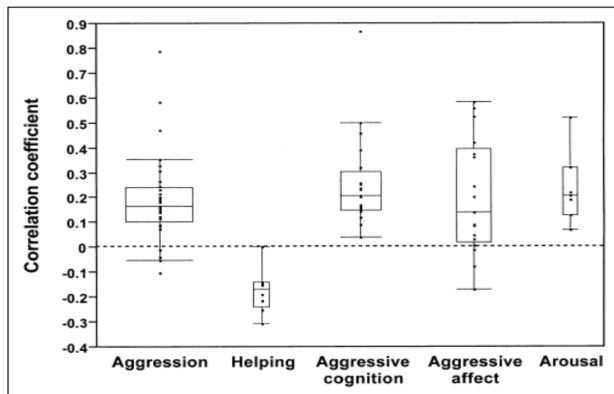


Figure 2: Results of Anderson & Bushman 2001: Box Plots of Correlation Coefficient on Violent Video Games and Five Dependent Variables

Thus, through the meta-analysis conducted by Anderson & Bushman in 2001, it can be concluded that there is a positive correlation between violent video games and aggression and further expresses other aggressive traits such as cognition, affect, and arousal. The GAM can also be seen where the situational variable, in this case, the violent video game, is used against the participants, and the three routes are altered, resulting in the influence of increased aggressive traits. One limitation of this study is that it is a meta-analysis. This means there may be researcher bias, meaning the researchers could have used studies that support their hypothesis and idea, leading to insufficient and skewed data.

## 2.2 Gentile et al., 2004

Moving on, Gentile et al. conducted a study in 2004 aimed to investigate the influence of violent video games on aggressive behaviour in adolescents. The research also used the GAM as a framework for the analysis. The researchers gathered the participants of 7th graders, 8th graders (496 participants), and 9th graders (111 participants). The students that were gathered were all from Mid-Western schools, including one Urban school (67 participants), one rural public school (196 participants), and two suburban schools (350 participants), making a total of 607 participants. In the study conducted by Gentile et al. 2004, 52% of the 607 participants were men and 48% were women. The research was conducted from April 4 to May 2 2020. To collect descriptive data, the study instructed the participants to complete an anonymous survey about their attitudes, habits, video game knowledge, academic performance, and a trait hostility measure (Gentile et, al 2004). Apart from being required to name three video games, participants were also asked how frequently they play each game and how violent it is on a 7 / 10-point Likert scale (1 = rarely/not violent, 7 / 10 = often/violent). Another 5-point Likert scale was utilized to ask the participants whether their parents limit their gaming time or seek to see the game's reviews before buying it. Another 5-point Likert scale was utilized to ask the participants whether their parents limit their gaming time or seek to see the game's reviews before buying it. In addition, a 4-point Likert scale was used to ask participants how often they argued with teachers. Participants were also asked if they had ever been in a fight at school the previous year and were only allowed to respond with a "yes" or "no." The results showed that 94% of the participants play video games, and 59% reported playing at least once a week, with the average amount of students spending 9 hours per week playing video games (Gentile et al. 2004, referenced in Science Direct). The average score on the Likert scale was used to evaluate how violent the students' video games were. The results of playing violent video games presented a mean of 5.4, and there were differences between the preferences of the two sexes for playing violent video games, with the boys scoring an average of 6.7. In contrast, the girls scored an average of 3.8 on the Likert scale. It presented that 22% of girls and 68% of boys opted for violent video games. Furthermore, 16% of girls and 1% of boys said they disliked violent video games. According to the findings, playing violent video games positively

correlates with aggressive behaviour, especially trait hostility during adolescence (Gentile et al. 2004, referenced in Science Direct). In addition, in Gentile et al.'s study, they discovered a negative correlation between the amount of violent video games played and school grades, which can also be seen in Figure 4 (Gentile et al. 2004, referenced in Science Direct). Thus, violent video games negatively influence academic performance and, most importantly, increase aggressive behaviour.

**Conclusion**

Although other significant studies explore the opposite where there is no relationship between violent video games and aggression. In this article, the relationship between violent video games and aggression was explored through the use of two studies, Anderson & Bushman 2001 and Gentile et al., 2004.

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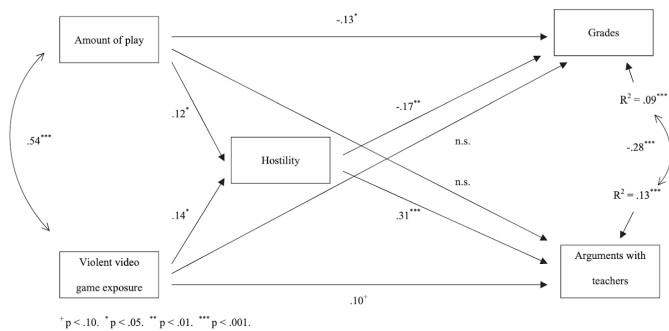


Figure 3: Path analysis (model) - Predicting Grades and Arguments with Teachers (Gentile et al. 2004)

Gentile et al.'s study supported the GAM as it observed that playing violent video games may increase aggressive behaviour and emotions. Additionally, as the GAM states, playing violent video games can result in negative feelings that interfere with cognitive processing and increase impulsive behaviour. This can be seen where the students have a decrease in academic performance when having more playtime on the games. The limitations to this study can be seen as the participants are asked to fill out a questionnaire, which could skew the results as it may not be accurate and since the participants may believe that the researchers have a set of expected results leading to changes in their answers on the form. Furthermore, the study was a longitudinal design where they collected data multiple times at specific times. However, the data was from April to May, lasting for one month, meaning the time is insufficient to gather the long-term effects of violent video games on aggressive behaviour. Another critical factor is that the researchers did not consider other variables such as family environment, personal traits, and other factors that could have influenced the behaviour of aggression.

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