

Merit

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Introduction

Violent media and video games are becoming more and more prevalent in today's society and the impact on an individual's aggressiveness is being questioned. The biological and behavioural approaches and how they interact have been continually explored to understand what exactly is responsible for aggressive behaviour and how violent media may impact this.

Biological Approach

The biological approach towards aggression is based upon the physiological cause for an individual's actions. This involves the regions of the brain (neurochemical), genes and hormones, all physical and biological aspects of an individual. This approach is a reductionist approach and explores only the natural, built-in tendencies of an individual. An advantage of the biological approach to psychological implications is that it can be physically studied i.e. the brain can literally be cut open to study which parts affect emotion and aggression or the hormonal levels within a person can be tested to see how it impacts their behaviour. Many biological explanations for aggressive behaviour is due to the influence of violent media and video games that influence the brain and how it reacts and responds with aggressive behaviour.

A biological explanation shows that the use of violent video games has the potential to impact the real life behaviour of an individual due to enhanced neural factors. This neurochemical approach towards aggressive behaviour (from exposure to violent media) is implicated by different regions of the brain, such as the amygdala. The amygdala is a collection of cells within the temporal lobe, part of the limbic system, and responsible for controlling the emotion and behaviour¹ within an individual. It has been studied that, when stimulated, the amygdala is responsible for very powerful emotions, such as anger and fear. Theories state that the more exposure an individual has to violent media or playing violent video games, the more desensitized they become to violence with the amygdala less responsive and the individual displays more aggressive behaviour. A method that supports this theory was Downer (1961), a study in which the amygdala within a monkey was surgically removed from one side of the brain. When presented with the visual stimulus of human presence with the eye on the side of the brain that had the amygdala present, the monkey displayed the usual somewhat hostile and aggressive behaviour. However, when the monkey witnessed human presence through the eye of the side of the brain that had the amygdala removed, it showed far more placid and relaxed behaviour.² This clearly displays that the amygdala is significantly responsible for the levels of aggressiveness in an individual's behaviour. Another study to support this theory was the study by Raine (1997)³ that found significant neurological differences between murderers and non-murderers. The difference in the function of the amygdala displayed the difference between the individual's emotional responses and failure of learning from one's actions or experiences. This shows that if the amygdala is damaged or failing to perform, the individual becomes desensitised to violence and aggressive behaviour and shows increased suppression of fear. The more that

an individual sees violent actions on TV or in movies, or plays violent video games, the less responsive the amygdala becomes to violence and the more desensitised the individual becomes to violence in real life - this then promotes more aggressive behaviour from the individual.

Another biological approach towards the effect of violent media on an individual's aggression is the impact of hormones. Hormones are chemical messengers that circulate the body and inform different organs and parts of the body to perform certain functions. Different hormones are released as a result of different experiences or actions. The particular hormone, testosterone, is a predominantly male hormone that is generally associated with negative, aggressive tendencies. There are multiple theories that there is an increase in an individuals' levels of aggression and dominance when they have a higher level of testosterone. A study in 1998 by Kalat⁴ displayed that 15–25-year-old men with the highest levels of testosterone also displayed the highest aggression, according to their crime statistics.⁵ Another study that backs up this theory was Edwards, 1969⁶, where female rats were injected with testosterone and showed higher levels of aggression, based on their fighting frequency. This proves that the more testosterone in an individual means that they are more likely to show aggressive behaviour, regardless of the gender. In violent video games, this can encourage the individual to express their dominance, behaviour which can then translate to real life and be enhanced by the testosterone's effect of competitiveness and dominance.

Behavioral Approach

The behavioural approach towards aggression is defined by the behaviour an individual learns from their surrounding environment. This is a psychological, social approach towards aggressive behaviour. Important components that contribute to learned aggression include observation and vicarious reinforcement, implicate behaviour to be copied by the individual and desensitizing them from the aggressive behaviour. Media, specifically aggressive TV and/or video games is largely influential on an individual's behaviour and levels of aggression.

The behavioural approach is highly influenced by what the individual sees in their surroundings by watching the behaviour of other people and copying depending on the positive or negative consequence that it results in. In the theory by Albert Bandura, called the Social Cognitive Learning Theory, theorises that an individual will learn their behaviour by observing that of others. Rather than receiving our own positive reinforcement, we can observe the consequence of the behaviour of others to evaluate whether this is a good behaviour to imitate or not.

Observational learning takes place more often in the younger years of life as children tend to rely a lot on learning off authority figures such as parents and teachers. This is also significant in how children learn to respond to and socialise with others. Observing the consequences of others to make our own decisions about the behaviour is referred to as vicarious learning.

Bandura explained that in order for the Social Cognitive Learning Theory to be applied, it requires attention, retention, motivation and potential. Attention is required to pay attention to the actions of the model; retention to retain the actions of what has been observed; motivation is required by understanding the 'outcome expectancies' as the result of the

action; potential is required by the individual to be physically and/or mentally able to carry out the action. The main method that explored Bandura's idea was the Bobo doll experiment. In this experiment, a group of children were selected to individually observe an adult acting violently towards a bobo doll toy, hitting and punching it, then leaving the children alone in the room with the same toys. The results of this experiment displayed that many of the children then replicated the same behaviour as that of the adult, conducting the same hitting motions that they had earlier observed. This behaviour from the children supports Bandura's theory that by observing another individual's behaviour they retain the actions then mimic the behaviour, including aggressive behaviour. Regardless of whether a child is intending to learn or aware that learning is taking place, they are shown to be more likely to replicate the behaviour being observed if it is being carried out by a model that they had similarities to, such as a person of the same gender, or someone they respected, such as a parent, sibling or role model. The actions of others that younger people observe can be applied to that of video games as well. By observing the aggressive behaviour in characters of violent video games, children can imitate these actions into their real life behaviour. Their characters on these games tend to somehow relate to the individual, whether it's characterised gender, age or visual presentation. The SLT can be applied to violent media and video games as they are more often than not, targeting young minds. The violent media allows them to observe how their realistic looking problems on video games can be solved through violent behaviour, which they then apply to real life situations as they have learnt to believe that aggression is the solution to their problems. They are not bothered or disturbed by the violence of their actions or the pain they may be causing others because their constant observation and learning of violent behaviour causes them to become desensitized and used to seeing violence.

The behavioural approach also explores how an individual's behaviour is influenced by operant conditioning. Operant conditioning is when an individual bases their behaviour by observing the consequences of others behaviour. When the behaviour is positively reinforced with reward, it is more likely to be repeated by the observer, whereas if the behaviour is negatively reinforced with that of pain as an example, it is less likely to be repeated by the observer. B. F. Skinner theorised that the likeliness of the repetition of a behaviour is dependent on the positive or negative outcome. To back up his theory, Skinner carried out an experiment on rats, using the process of operant conditioning. In the experiment, these rats would accidentally knock a lever creating an accidental response which released food. The rats soon learned, from positive reinforcement as reward, that if they repeated the behaviour and pushed the lever, they would receive more food. This then becomes a deliberate response as they want to repeat the action to earn the food. This can be applied to that of video games as the player completes a task or action and is rewarded with something beneficial such as coins or levelling up, giving a positive result of the individual's actions, therefore making them want to repeat the behaviour for the reward. This is a form of vicarious reinforcement that applies to the same of aggressive behaviours, rewarded then repeated. Violent video games also follow the same structure that rewards particular actions, ranging from hitting to killing other virtual players for points and higher rankings. Games like this, such as Fortnite or Call of Duty with improving realistic graphics, positively reinforce aggressive behaviours with virtual rewards that can then be carried into real life. Cognitive priming is also incorporated in the design of video games as they display the violent behaviour of the virtual character which then primes thoughts of violence and aggressive thoughts that could potentially lead to harming others.⁷ In the case of Adam Lanza, he spent many hours playing violent shooting games and being rewarded through rankings and high scores, one of the games called School Shooting⁸ (Pilkington, 2013), in which the character would enter schools and shoot students. The rewards of these games

positively reinforced his violence online, which he then carried into real life behaviour in the Sandy-Hook elementary school shooting. This shows that violent media such as video games, can perform operant conditioning on its target audience, which tends to be children and young adults and positively reinforce aggressive behaviour. The behavioural approach uses the social learning theory and operant conditioning to apply the effects of violent media/video games to the cause of aggressive behaviour within an individual.

Interactions Reductionist:

Both the behavioural and biological approaches are classified to be reductionist approaches, meaning each approach is their own separate and individual explanation for the cause of aggression in a person and how it is impacted by exposure to violent media and video games. The biological approach consists of the neurological, hormonal and genetic explanation as to why a person is aggressive and how this is influenced by the aggressive media. This reductionist approach singles down the cause of aggressive behaviour into basic reasons for aggression, such a high level of testosterone or damage to one's amygdala. This does not take into account any environmental influences that may be part of the behavioural response.

Biological implications towards aggressive behaviour can quite literally be seen under an MRI scan, autopsy etc. to identify the physical mistakes that may have led to such violent behaviour. For example, in the case of Phineas Gage, it was clear that there was a physical, biological cause for his change in emotion and personality that was responsible for his irreverent behaviour and profane language. In the case of the Downer method which explored the impact of the amygdala on behaviour, the results are promising in showing how the visual stimulus connects with the amygdala. This clearly displays how the amygdala is responsible for a monkey's emotions and when removed, the more passive the behaviour. However, this cannot be proven to work the same in humans - while monkeys are very closely related to a human, they are not the exact same, nor as developed as humans and therefore do not show an exact representation of the impact of the amygdala on human aggression. It is entirely focused on the physical approach and does not interrelate with the behavioral approach.

The behavioural approach, however, is purely psychological and focuses solely on how the environment is responsible for the aggression of an individual and how the others around them act. It ignores any possible biological influences on aggressive behaviour, such as genetics or injuries to the regions of the brain responsible for emotion. This is largely just based on theories; however they can be backed up by experiments or real life cases. The Social Learning Theory is widely used as an explanation for learned behaviour that influences an individual's aggressive tendencies and a reductionist approach can focus on this as a singular cause of aggression. A method that explores this approach was Bandura's. This method was used to back up his theory, however it does display its own strengths and weaknesses. The benefit of this experiment is that it shows the children are easily influenced by observing the behaviour of an authoritative figure. It is limited however, as it was only based on one experiment with the same children. As these kids may have already been pre exposed to violent behaviour, possibly from their household or school, public etc., this could affect their reaction to watching the adult. This experiment would be more reliable if the children had been raised with no earlier exposure to violence and therefore would be a 'clean slate'. However, the only way to ensure they are not exposed to violence would be to shut them off from the outside world so everything they see can be controlled. This would likely impact their social behaviours and alter the experiment in a different way, as well as being ethically wrong. Another downfall of this experiment is that it may have impacted the

children in the long run - although it may have been seen as a harmless experiment, it would actually impact their levels of aggression in the future and how they deal with situations. This approach focuses strongly on how violent media causes disinhibition, desensitisation and cognitive priming which then becomes relevant to the application that violent media influences on an individual.

Interactionist Approach:

The holistic approach between the biological and behavioural approaches show the interrelationship of the two and how they impact each other. This explains how one approach cannot work without the other but must involve an aspect of each to complete a proper understanding of how aggressive behaviour occurs within an individual. The combination of so-called 'nature and nurture' brings together the biological and behavioural factors to give reason to an individual's aggression, implicating how both impact and support each other. This could mean exploring one's inherited traits that make them who they are and how the social factors can influence their natural personality which may affect their behaviour and how they respond to violence. For example, an individual may be born with a particularly high level of the aggression-related hormone testosterone - the biological factor. This means that they have a natural tendency towards a higher level of aggressive behaviour. If this individual is regularly exposed to violent media, their built-in tendency towards aggression will enhance the influence of surrounding violence applied through the behavioural approach. The implications of the behavioural impacts may include the Social Learning Theory in which the individual observes the violent behaviour of others and becomes desensitised to violent behaviour, causing them to become more likely to carry out the same behaviour. This observational behaviour, combined with a naturally high testosterone level, can cause the individual to carry out aggressive behaviour on a regular basis and possibly to a dangerous extent. Violent media then enhances the effect of both of these approaches on a person, displaying violent behaviour of others or characters to which the individual becomes disinhibited, carrying out the same or similar actions as it becomes more acceptable in their mind.

General Aggression Model:

The General Aggression Model (GAM) is an interactional approach that combines the likes of the biological and behavioural approaches. This model considers multiple aspects that could be the reason for aggressive behaviour, specifically social, cognitive, personality (such as goals and beliefs), developmental and biological factors, and how they all contribute to an individual's actions and responses in response and regard to violence. This model is specific for aggressiveness.

GAM was developed in 2004 by Anderson and considers how social learning and development is impacted through learning processes and how an individual responds, interprets and perceives the surrounding environment. It states that the repeated use of violent video games will reinforce aggressive behaviour as a normality and a desensitization to violence. Each time the individual witnesses or experiences the violence in the media/video games, they are more considerate to aggressive behaviours and that aggressive behaviour is generally the solution to real life problems and conflict. An example of how the GAM model may be applied could be Adam Lanza. Lanza grew up displaying very introverted behaviour, socially isolating himself in school and in group activities. He was very sheltered, mainly only socialising with his mother and spending the rest of his time in his room. This shows that he has not observed and learnt very much 'normal' behaviour from

other kids his age. He then spent a large amount of his childhood playing violent video games, observing the aggressive behaviour of the characters in which he participated as - this causes desensitization and disinhibition, contributing towards his violent act. His violent tendencies then developed even more as he became obsessed with past mass murders, those of whom had killed the most people, noting down the number of fatalities and who had the most. This then became his goal to kill the most people and become the best in terms of mass murders. The combination of these factors can be applied to the multiple aspects of the GAM model, all contributing to the result of his shooting at Sandy Hook elementary school.

Catalyst Model:

The Catalyst Model, like that of biology, speeds up the result of an action. Developed by Ferguson, 2008, the Catalyst model assumes that an individual who is already biologically aggressive are influenced by (friends and family etc.), leading to an outburst of violent behaviour. Although it is not the environment itself that causes the violent tendency, an environmental factor causing strain on the individual (such as financial issues or relationship troubles), can act as a catalyst to their predisposition to aggressive behaviour, speeding up their tendency to act on it. This implies that more naturally aggressive individuals are more likely to look for violent material and act on it, that individuals that are less naturally aggressive as they do not have the same desire for aggressive activity. This links to aggressive behaviour caused by the media in the way that the media can be an environmental factor that acts as a catalyst to speed up the individual acting on their aggressive behaviour. Adam Lanza as an example, may have already had an innate, biological aggression, however, his constant interaction with violent video games and obsessive researching of mass murderers catalysed (sped up) the result of him acting on it, leading to his action on the Sandy Hook elementary school shooting.

Societal Link:

The regular exposure of violent media and video games to an individual impacts their own aggressive behaviour. The debate of whether this is due to biological or behavioural factors, or an interaction of both, still remains undecided. It is, however, supported that the violence in video games does have a rather large effect on a person's aggressive behaviour. In order to try to prevent aggressive acts in the future, solutions to deal with exposure to violent media must be implicated in global society. The media is so easily accessed by anyone with Wi-Fi and a device these days, including young children. As children and young teenagers are the most easily influenced due to their developing brain and learning behaviour. The most obvious solutions to restricting violent media from younger children would be age restrictions and implicating small costs. While there are already age restrictions to video games, they are incredibly easy to bypass as they are minimally enforced. Online, it's as easy as just clicking a button to say you are 18 without any age proof or consequences for lying. To solve this, an increase in security on age restrictions should be applied - this could be as simple as uploading a picture of ID for proof of age. While they could use someone else's ID, this still creates another layer of protection. An alternative to this could be to charge a tiny fee to download a game. This could literally just be \$0.01 because then the person would have to have ownership of a debit card in order to make the payment which, in the case of NZ, is 15 years old. While this isn't 18 years of age, it would still be a drastic improvement. Other solutions to preventing violence could be to test at birth for the MAOA genes and restricting violent media from those who carry it. The ethical issues however, could be that it is not up to the individual whether or not they carry the gene so how is it fair for them to not be allowed to play video games like other kids their age. Another large part of

violent behaviour is the use of guns. As many violent video games recreate shootings, the learned behaviour from these are often applied to real life shootings as displays of aggressive behaviour. In America in particular, stricter gun laws would largely decrease the number of shootings and prevent people from easily accessing guns to carry out this violent behaviour. There are many contributors to violent behaviour that an individual may carry out, but preventing it before it happens, or identifying where it most likely will happen, is vital in decreasing the amount of violence in our society. Stricter education on teaching younger children how to stay calm in stressful situations instead of resorting to violence could make a big difference in how people react with or without aggressive behaviour in the future.

[The student also provided citations and a reference list, which has been removed for brevity]