

DO PIXELS KILL?

- A Study into Video Game Violence



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Introduction

What do the three towns Paducah (Kentucky), Jonesbro (Arkansas), and Littleton (Colorado) have in common? They were all scenes of multiple school shootings. The shooters were students who regularly played computer games. Like Eric Harris and Dylan Klebold from Columbine high-school who murdered 13 people in Littleton, and enjoyed playing the violent video game Doom. In fact, they made a customized version of Doom where they had unlimited ammo and where the victims could not fight back.



(A screenshot of Doom III, 2004)

Such incidents have triggered hefty debates in the media and at top political levels about the effect of violent video games on people. People have become aware of the increasing amount of violence in video games as seen in Doom, Quake, Carmageddon and Grand Theft Auto. These games have been accused of glorifying violence and ignoring the repercussions such actions would have in real life.

Considering the violent content of video games, it is thought provoking if not problematic that they have become both more widespread and popular.

Surveys show that there has been a ten percent increase in the ownership of gaming console between the years of 2000 and 2002, so that more than half the households in Denmark now own a gaming console. (Medierådet's

Report). Furthermore, the weekly amount of time spent on video games by 4th grade children was 7.5 hours in 1996 (Buchman and Funk, 1996).

But not all the video games are violent; some of them are designed to teach. Some people focus on video games' ability to teach, primarily through the highly interactive game play while others blame the games for stimulating violent behaviour.

Questions of whether or not playing violent video games increase the likelihood of committing acts of violence must be answered in order to prevent potential violent consequences for society. In light of the still more violent and realistic graphics (Doom III, 2004), we cannot simply lean back and hope that it will do no harm. We have little knowledge of the long term effects of playing, only speculations and extrapolations. This is not enough. With the number of kids, adolescents and adults playing today, we have a responsibility to know.

Problem Definition

Research question:

Does playing violent video games increase aggressive behaviour?

Secondary questions:

- Is it possible that some real life violence is carried out by people *copying* video game violence?
- Can violent video games decrease real life violence?
- Can violent video games lead to a desensitization of the user?
- Do rewards and punishments alter the (potentially violent) reaction of the players?
- Does aggressive behaviour lead to violent behaviour?

Delimitations

- Our initial idea was to focus on violent video games' effect on children. After reading several studies, we realised that the focus within the field is spread out to incorporate students, adolescents and children of differing ages. Hence, the relevant focus group for the research and conclusions of this project is set to include school children and students.
- We will focus on violent video games in our project; more specifically violent games in which the participant inflicts damage on humanoid objects. These objects will be defined as anything within the game recognised by the player as 'human' or resembling human. With this specific focus we will be able to exclude games in which there is no identification of the adversary as a 'sentient' being. We have chosen this delimitation as we want to focus on games which allow for the most profound emotional impact on the player. We take for granted here that the ability to recognise the adversary as 'human' will increase the emotional response to that adversary. Pacman (a game from 1980, in which a small, round creature who eats dots and wanders around in a crude maze while avoiding simplistic, ghostlike creatures) will not be regarded as a violent video game by our definition, despite the fact that the player must take hostile actions against the ghostlike adversaries.
- We will not look into the significance or the effect of the sexual content of a game, despite the fact that some studies have shown a connection between a heightened state of arousal and the increase of subsequent violent behaviour. We do realise that there are problems with delimiting the factor of sex, because often violence and sex are displayed in the same situation. But we do not want to focus on this

kind of violence, as we feel that they are different types of violence.

- We will not examine the neuro-psychological changes which may possibly occur as a consequence of playing video games, as we do not have the opportunity to observe this within the framework of our project. While it would be interesting to examine whether for example aggressive behaviour within a video game triggers the same neuro-transmitters as similar actions carried out in real life, and would perhaps enable us to prove or disprove the theory of catharsis, we neither have the time nor the required knowledge to evaluate such results. Also a comparison with real life violence or aggression is highly questionable on an ethical level.
- We are aware of the fact that other factors than video games influence people, and that video games might not be the only causal factor leading up to an action. Social and personal factors such as divorced parents, school trouble, loneliness, and so on may contribute, cause oracerbate the actions contributed to video game violence. Other media too may play a role. This is one of the problems of the studies which have been conducted as they often view video games as the only influential factor. They fail to consider the fact that TV and real life experiences might have influenced a specific violent act more than the video games blamed. While we are aware of the multiple, often interlinked factors, which may in the end build a causality chain leading to acts of violence, we have chosen for the purpose of our project to disregard factors other than video games. While this delimitation will hold for the main part of our project, we may, in the course of our analysis and discussion chapter include other factors, to give a broader view of the problematic of this project, and in deference to real life which can rarely be explained by a single causal factor.

Definitions

In order to write a project which focuses on whether acts of violence and aggression displayed in video games leads to aggressive behaviour in real life situations a definition of the terms aggression and violence as they apply both to the games and real life is necessary.

We define real life aggression in the same way as "... behaviour intended to harm another individual who is motivated to avoid that harm. It is not an affect, emotion or aggressive thought, plan or wish. This definition excludes accidental acts that lead to harm, such as loosing control of an auto an accidentally killing a pedestrian, but includes behaviours intended to harm even if their intent fails, such as when a bullet fired from a gun misses its human target." (Anderson and Bushman, 2001, p. 354)

Our definition of aggression does not necessarily include violence, yet a definition of the term is useful as we will state a difference between aggressive and violent behaviour.

"Violence refers to extreme forms of aggression, such as physical assault and murder. All violence is aggression, but not all aggression is violence." (Anderson and Bushman, 2001, p. 354) Violence thus necessitates injury or harm caused on others. Yet, as it is an expression of aggression, it carries the condition that the one harmed is "...motivated to avoid that harm." (Anderson and Bushman, 2001, p. 354).

Our initial definition of real life aggression and violence do clearly not function when discussing video games. Even though violent multi-player games may satisfy the specification of harming others (if others are defined as humans) most games are played against computer generated enemies. Even then, intent to harm is questionable at least in so far that winning against another player in a multi-player game is hardly causing the loser harm, albeit he may be very motivated to avoid it.

Another definition of violence must clearly be applied when dealing with video games that take into account the rules of the media. In other words, we cannot use specifics such as intent to harm, nor the consequences of a player's actions on another person, since we are dealing in characters rather than people.

To define video game violence we must start by defining the 'others', which will be the subject of the violence. First then can we define 'violence' as it concerns video games. We will define others as characters in a video game. In our project we chose to define characters as objects which are humanoid in appearance and/or reasonably perceived by the player as sentient. While some researchers refer to Space Invaders (released 1978) as violent, our definition excludes the game, since it displays small triangular shapes – ships – which one must shoot down. There are no humanoid/sentient characters in the game although their presence may be inferred as unseen pilots of the space ships.

Video game violence will be defined as any action which leads to a realistic depiction of injury or death, and/or a realistic emotional response to violence/injury, such as showing fear, pain or screaming. This definition of violence excludes for instance Mario Brothers (1984) where countless adversaries are killed, only to turn into coins, disappear into thin air, or fall beneath the screen. Further, none of these adversaries attempt to avoid being killed, instead they simply stay in their paths, following predetermined patterns of movement.

Method

In this project we will do a comparative analysis of four main theories and apply them to the subject of violent video games. We will use various studies to back up or refute the four theories, and attempt to clarify which

one gives the clearest picture of the consequences of playing violent video games. These theories have been chosen in an attempt to answer our secondary questions, which will in turn give us the tools to answer our main research question.

The first theory, modelling, is built upon the idea that everything perceived can potentially be incorporated into one's behaviour, after passing through a system of selective choices. Besides information being transmitted and incorporated, modelling also explains how we structure this incorporated information cognitively. And how and what we structure can in the end determine how our behaviour is. So the theory more or less supplements all of the theories as the other chosen theories are not explaining how we process everything that we obtain through our senses. We have also incorporated the different explanations of what modelling is, as some claim it to be mere imitation. We have incorporated modelling in our project because it provides us with a tool that can explain through what processes video games might affect our behaviour.

Furthermore we have chosen to use Freud's theory of catharsis in our project. As most of the theories we have found when studying for this project, advocate that video games do indeed cause aggression, we wished to balance our sources, and add a theory which claims the opposite position. The theory of catharsis claims that observing, and becoming absorbed in negative emotions, for instance in the form of a tragedy, cleanses the viewer of such effects. "...observation of aggressive behavior exhibited by others tends to reduce the probability of aggression on the part of the observer" (Rosenbaum & deCharms, 1960, as quoted in Bandura, Ross and Ross, 1961). The theory may be used to defend video games and provides a useful counterpoint to the other theories in our project.

Desensitization is one of the approaches which stem from behaviourism, and as a tool (systematic desensitization) it is primarily used to cure people of fears or phobias, by desensitising them to the object of the phobia. The theory of desensitization claims that repeated exposure to an input interpreted as negative can lead to an increased tolerance to the input.

We will use this theory to explain whether players may become indifferent to real life violence and suffering as a result of playing violent video games.

Desensitization is not a theory which, strictly speaking, deals with violence as a possible result of for instance playing violent video games. We have nevertheless chosen this theory because it shows a potential consequence of playing violent video games; a consequence which is not necessarily violent but may have just as destructive implications on a desensitised society as violence. Also, we believe that desensitization may in the end result in aggression, despite the fact that the theory does not initially make this claim.

Furthermore, we have chosen to use Anderson and Bushman's General Aggression Model because it combines many of the dominant theories within the field. Another reason is Anderson's prominent and senior position in the discussion of video games and his place as an advocate of the belief that violent video games cause aggression. Furthermore the theory is especially useful as it can explain the long term effects of exposure to violent video games.

Also we have chosen to use studies from research on TV aggression, when we feel that the conclusions reached are applicable to video games and our project. We choose to incorporate TV research to a small degree because the field is older, and thus more studies have been conducted. Even though

video games as a media are different from TV because of its interactive nature, many theorists (e.g. Anderson) agree that some results from TV research can be translated into video game research.

To provide a counterpoint to our main theories, which mostly favour laboratory experiments or tests, we will perform a methodological investigation of the various research methods. To back that up, we will also look into Carsten Jessen's (2001) ideas about participant observation and see whether he offers a viable alternative to laboratory tests and experiments.

All the theories we have chosen are important theories in psychology and they represent different aspects of the field. We believe that they can cover the psychological research relevant to our project. We will examine how the different theories understand the relationship between playing violent video games and aggressive behaviour. We will look into different studies, and see if their results support the arguments put forth by the theories. Using both the theories and studies we hope to reach an answer to the question of whether playing violent video games increases aggressive behaviour or not.

Theories and Studies

Nowadays, games are an integral part of teaching in many areas of society. (Medierådet's report) They are being used as teaching tools right from the start of elementary school until university, to when you are in job training and even for military purposes.

"...[video games] successfully get people's attention (Krendl & Lieberman, 1988), they teach attitudes necessary for successful behaviours (Anderson & Dill, 2000), they enable people to feel competent about performing a task (Krendl & Lieberman, 1988; Kozma, 1991), they are motivating (Krendl & Lieberman, 1988), they allow people to actively participate instead of passively watch [as opposed to TV media] (Krendl & Lieberman, 1988), they show all the steps necessary to perform a behaviour or series of behaviours (Gentile & Anderson, 2003), and they allow repetitive practicing (Kozma, 1991)". (Buckley and Anderson, in press, p. 9)

The problem is that if video games are such a good tool for teaching, then it is perfectly reasonable to suggest that violent video games can teach people to be either aggressive, violent or both. Still, the discussion is ongoing as different psychologists and researchers make opposing claims, and many of the tests carried out are subject of intense scrutiny and criticism by the gaming industry and other academics.

We will in the following pages review some of the most important theories and studies, in order to get an overview of the most relevant claims and points within the field.

We will use several theories in an attempt to understand the consequences of playing violent video games: the theory of modelling will enable us to understand some of the likely reasons for why video games may potentially affect us to a large degree.

Desensitization will give us another point of access into the problematic, and can give us an insight into other negative effects of video games, even though these might not initially be violent or aggressive. As we want to give a balanced account of the potential consequences of playing, we have included catharsis as a theory, because it provides us with a counterpoint, and presents the possibility that violent video games might not be harmful, but instead decrease violent affect in the players. The last theory we have chosen to use in this project is the General Aggression Model by Anderson and Bushman. It is interesting because it incorporates a lot of the theories in the field. Furthermore Anderson is one of the most prominent voices in the research of violent video games.

The first theory we will introduce, is modelling.

Modelling by Albert Bandura

Most human behaviour is learned by observation through modelling. When observing others, one encodes the information so that it can be a guide of action for future occasions. Thus one can obtain knowledge and skills by observing how others behave (in words or images) and what consequences their actions yield.

Modelling is "...one of the most powerful means for transmitting values, attitudes and patterns of thought and behavior" (Bandura, 1986, p. 47).

The process of modelling has many names including "imitation"; Bandura believes that there is a process of cognitive selection at work, when modelling others behaviour, while according to Bandura, other theorists believe it to be merely a question of imitation. Their studies are conducted to match the ideal of modelling as an exact reproduction of what is perceived. Whereas modelling provides "...conceptions and rules for generating variant forms of behavior to suit different purposes and circumstances". (Bandura, 1986, p. 48)

Personality theorists and developmentalists interpret modelling as identification. Yet how they define identification varies a lot with the different theorists.

However, two things are assumed with the two terms; I) imitation produces identification and II) Identification produces imitation. According to Bandura these two theses have not been supported by empirical evidence. Both "identification" and "imitation" influence observational learning of behaviour. All modelled information must be symbolically represented if it is to be a guide for future actions. (Bandura, 1986, p. 48)

Modelling is important in context to videogames in many aspects, as modelling explains for example how we structure the information received through our senses. Although it does not explain what is incorporated and what is not incorporated into memory, it defines what structures we follow when modelling behaviour. This lack of insight into the cognitive processes of the mind is a legacy of the behaviouristic idea of the black box. The reason why the theory of modelling is unable to account for what information is cognitively incorporated into memory and what is left out is that the process which governs the incorporation is internal. Meaning that science cannot measure it. It is however able to measure the level of arousal and then link it to the different situations a person experiences. In connection to aggression and violence, modelling claims that even though one can "...acquire, retain, and possess the capabilities for skilful execution of the modelled behaviour, it does not equal a performance". That is if the observed behaviour is "...negatively sanctioned or otherwise unfavourable received by the observer". (Bandura, 1973, p.71-72)

People are generally taught by social institutions that violence is negatively sanctioned. It follows that video game violence, being perceived as violence would thus be rejected; meaning that the behaviour witnessed will not be

modelled. If this is the case blaming video games for their violent content is illogical in this context.

Modelling 1)

Observational learning effects: By observing, one can learn new behavioural patterns, judgmental standards, cognitive competencies, and generic rules for creating behaviour. Observational learning functions best when the observer does not possess the behaviour that he or she is observing. Modelling can also teach people to organise already existing components into new organisations, and it could be questionable whether or not it is a new learning experience as the observer already possesses the components. But just because we know the words or the meanings it does not make us aware of all the different forms or actions that the word can take. (Bandura, 1986, p.49) Video games clearly provide us with a media from which, often violent, behaviour can be modelled. They are also often composed of parts which are recognisable from real life, such as running or driving cars. Yet these recognisable parts are often arranged in such a way so that the entirety of the games becomes unrecognisable in the context of everyday life. Carmageddon (1997) for instance is a car race game in which the player (or driver) is expected to run over pedestrians to gain extra points.

Inhibitory and disinhibitory effects: Another function of modelling is to strengthen or weaken already possessed knowledge. There are three factors that play a major part when trying to clarify what the effect of modelling is.

- a) The observer's judgement of his ability to execute the modelled behaviour.
- b) Whether or not the action modelled yields rewarding or punishing consequences for the observed person.

c) And whether he would meet the same rewarding or punishing consequences if he were to engage the same actions.

Inhibitory effects are shown when observers reduce their performance of the behaviour being modelled or become more restrained in their action because he perceives the action to carry negative consequences. Disinhibitory effects are shown when increasing their performance of formerly inhibited behaviour after having seen somebody engage in threatening or prohibited activities without experiencing adverse effects. (Bandura, 1986, p.49)

Response facilitation effects: The actions of others can also serve as social prompts that can cause similar behaviour in the observers. Response facilitation effects are distinguished from observational learning and disinhibitory effects since no new responses are acquired to carry out the actions modelled. These actions have not previously been engaged in, not because of inhibitions, but simply because the incentive for performing the action has been too weak. (Bandura, 1973, p.68-69).

Environmental enhancement effects: When observing, an observer's attention can be drawn to particular objects or environmental settings that the people observed favoured, and as a consequence use the same objects to a certain extent, although not always in a similar manner. A specific experiment that confirms this thesis is the Bobo-doll experiment which we will return to later. However it depends on what characteristics the observer focuses her/his attention to (Bandura, 1986, p.50).

In video games terms, this could translate to a fascination with for instance guns, after playing violent games in which the characters used guns as their main weapons. However this fascination with guns would not necessarily mean that a player of violent games would go out and shoot people, in the

manner of the character played. Instead he might simply collect guns, study them, or do target practising.

Arousal effects: Social interaction involves display of emotions and observing somebody being emotional tends to heighten emotional arousal in observers. The observed emotion can determine the intensity and form of ongoing behaviour. This is clearly problematic in light of the advances in graphics and computing power. Games are able to display characters which look increasingly realistic; characters who exhibit realistic reactions to being killed or hurt; characters who is given a realistic personal history and a distinct personality. This could lead to emotional arousal on the part of the players, ensuring that modelled behaviour could impact the future behaviour of the players more strongly as the development in video games continue.

In sum modelling can function as instruction, inhibitors, disinhibitors, facilitators, stimulus enhancers and emotion arousers. These can function separately, but often function conjointly.

It is important to differentiate between the different modelling studies, as they generally have different focuses. The above mentioned form of modelling is devised to explain disinhibitory, social facilitation, or environmental enhancement effects. Whereas the following modelling study is designed to clarify what processes undergo changes.

Modelling 2)

There are four subsystems governing observational learning which are to be specified because they specify the conditions that must be obtained if the observed behaviour must have an enduring behavioural effect on the observer.

Attentional processes = "a person cannot learn much by observing if she/he does not attend to, or recognise the important features of the model's behaviour" (Bandura, 1973, p.69). It all depends on what they find characteristic of the modelled model's behaviour. And of course this also has something to do with our cognitive processes. We are not capable of remembering all the characteristics of a person or a situation and therefore we remember characteristics that fit into our already existing mental structures. Therefore an explanation for why we sometimes misinterpret situations has something to do with our mental limitation. Within any group certain members are more likely to be selected as sources of behaviour than others. These models are chosen because of results their actions typically elicit. Furthermore if a person is highly ranked within hierarchies of prestige, power and competence, that person is perceived as being able to gain better results than others, and therefore these "better" models get more attention. Observational learning however is not a passive receptive process, but rather a person chooses between several differing characteristics of several persons, and therefore incorporates a mixture of behavioural attributes. (Bandura, 1973, p.69-70)

Retention processes = a person cannot be influenced by a model's behaviour if she/he has no memory of it. Therefore the response patterns must be represented in a symbolic form, in order for it to be reproduced. These symbols are images or descriptive verbal symbols containing information. In addition to this symbolic coding, rehearsing also helps the encoding process, either through mental rehearsing or re-enactment (Bandura, 1973, pp.70-71). In context to video games, repeatedly performing an act of violence can eventually lead to a symbolic encoding of the information. This encoding however still depends on what we chose to focus on (attentional processes). Thus it varies from person to person, depending on their national, cultural,

social and personal background. This means that we encode information in a way which fits into already existing memories. In other words; how we encode information depends on what is already encoded, making it a very complex process.

Motor reproduction processes = "To achieve behavioural reproduction, a learner must put together a given set of responses according to the modelled patterns" (Bandura, 1973, p.71). And the amount of learning depends on whether or not the person has the required component skills. If present, the modelled behaviour is enacted more strongly than if the component skills are lacking. Even though symbolic representations are developed and retained, behavioural enactment is not possible if the person is psychically incapable of carrying out the activity that is observed (Bandura, 1973, p.71). Placing this in a video game context, certain games sport characters, which possess superhuman strength or powers. These games might evoke a desire in the player to model the behaviour of the characters. This is however impossible as the player does not possess the component skills necessary for such an act. He physically cannot fly or shoot rays from his eyes, etc. Still the behaviour exhibited by the characters is often composed of different parts. While a player might be unable to correctly imitate all details of the behaviour witnessed, he might still be able to model parts of it.

Reinforcement and motivational processes = even though a person can acquire, retain, and possess the capabilities for skilful execution of the modelled behaviour, it does not equal a performance. The reason for this is that the behaviour can be negatively sanctioned or otherwise unfavourably received by the observer. These reinforcements influence and regulate the

amount of attention people will pay to the various models they encounter (Bandura, 1973, p.71-72).

Bandura sums up: "For reasons given above, exposure to models, even prestigious ones, does not automatically produce matching performances. In any given instance absence of imitative behaviour may result from faulty observation, retention losses due to inadequate symbolic representation and rehearsal, motor deficiencies or simply unwillingness to perform the exemplified behaviour because of its unfavourable consequences." (Bandura, 1973, p.72)

- The Bobo Doll Experiment

Bandura's classic experiment with modelling shows how children model aggressive behaviour towards a Bobo doll¹. The experiment was recorded and we watched a small excerpt of it. On the video, Bandura also briefly explained the experiment, and defended his method, which we will come back to later.

The experiment was carried out with 72 subjects, divided into an equal amount of males and females, between the ages of three and five. The subjects were divided into three groups, one would watch an aggressive model, one would watch a non-aggressive model, and the last group would function as a control group, with no exposure to a model. Further there was a subdivision of the groups, so that some children had a same sex adult model, while others watched a model of the opposite sex. The children would observe while the model mistreated a Bobo doll, while ignoring the other toys in the room, except for when they functioned as weapons against

¹ An inflatable, conical, life size doll, which automatically snaps back into its vertical position when pushed over. Further details of this experiment will be given below.

the doll. Some of the ways of abuse were novel, such as lifting up the life size doll and slamming it into the ground vertically. The non-aggressive group would watch a model play quietly with other toys also present in the room. All three groups of children were then individually placed in a room which had several play items including the doll. The ones seeing the violent model emulated the behaviour viewed as well as adding other types of abuse. The control group also hit the doll, but did not imitate novel ways of abusing the doll (like lifting it up and slamming it down). The non-aggressive group too aggressed against the doll. However there was a marked difference between the three groups in that the violent group instigated a larger amount of aggression. (Bandura, Ross and Ross, 1961).

While this clearly links the behaviour of the subjects with the one modelled, it does not prove that violent models create violence.

“To the extent that observation of adult models displaying aggression communicates permissiveness for aggressive behavior, such exposure may serve to weaken inhibitory responses and thereby to increase the probability of aggressive reactions to subsequent frustrations. The fact, however, that subjects expressed their aggression in ways that clearly resembled the novel patterns exhibited by models provides striking evidence for the occurrence of learning by imitation.” (Bandura, Ross and Ross, 1961, p.580).

While the experiment shows a clear pattern of imitation, it is unable to conclude whether the actions of the (aggressive) model also created aggression in the subjects, or whether his or her behaviour simply permitted the release of already present aggression or frustration.

In fact, after the subjects had watched the aggressive or non-aggressive model (or, in the case of the control group, before they entered the play room, in which they would be observed for aggressive behaviour) the subjects were subjected to a "...mild aggression arousal..." (Bandura, Ross and Ross, 1961) to make sure they would exhibit aggressive behaviour. This was done both to test the non-aggressive subjects, and their ability to withstand the aggressive arousal, and because the subjects in the aggressive group would be less likely to instigate aggression on their own account. (Rosenbaum and deCharms, 1960, as quoted in Bandura, Ross and Ross, 1961).

"Consequently, subjects in the aggressive condition, in relation both to the nonaggressive and control groups, would [be] under weaker instigation following exposure to the models. Second, if subjects in the nonaggressive condition expressed little aggression in the face of appropriate instigation, the presence of an inhibitory process would seem to be indicated." (Bandura, Ross and Ross, 1961, p.577).

It might not be that the model itself inspired the aggressive mood: Perhaps he or she functioned instead as an implicit agreement to the behaviour, thereby showing the children that it was permitted to behave violently towards the doll. The children may have simply started hitting the doll because it was fun, and then perhaps increased the punishment of the doll as frustrations were vented. These frustrations may have nothing to do with the experiment or the model. The fact that they modelled the behaviour watched does not implicitly mean that it was the model which caused the actual underlying aggression. It simply caused some of the specific movements and actions chosen in acting out that aggression.

While the children in the control group, and the non-aggressive group would also have the same kinds of underlying frustrations, they would not, unlike the first group, have received an implied acceptance of violent behaviour. Thus they would conceivably be less aggressive, governed by external and subsequently internalised rules.

To claim that the experiment shows a flawless causal line between watching a model and increased aggressive behaviour is problematic to say the least. As mentioned above, we also watched a video which documented Bandura's experiment, in which he also defended the experiment. In response to the critique that laboratory experiments do not emulate real life, Bandura said that bombardiers also did not practice on real targets, and they still learned what they needed to know in a real life situation. (Yet bombardiers do not suffer from PTSD² after practising, they may however do so after shooting and killing real people.) Bandura does not really counter the argument: the laboratory setting is scientifically problematic. Bandura only explains the ethical reasons for why another approach, such as testing modelling of aggressive behaviour on human subjects, which is with a human target instead of a doll, is not used. While there is a marked correlation between the actions of the subjects and the model they were subjected to, it is still a laboratory experiment, and it is thus problematic to try to generalise the findings to real life. Whether or not the children would have aggressed against a human target is left unanswered.

The Theory of Catharsis

The original idea of catharsis stems from Aristotle (384-322BC), dating more than 2000 years back. He used it to describe the sense of cleansing that occurred when one had watched a tragic play. Through watching, the audience would live with the characters, feel what they felt, and thus be

² Post Traumatic Stress Disorder

purged of any negative emotions. While many theorists believe that playing video games will increase aggressive behaviour, others believe that playing video games is an act of catharsis, which will release aggressive affects, and balance out the mind (Carlson, Martin and Buskist, 2004). Freud accepted and further developed the idea of catharsis.

Freud discovered what he labelled 'psychic energy' through the case of Anna O. and the evidence gathered from his own clinical practice. He concluded that human behaviour is motivated by instinctual drives which are supplied by this 'psychic energy'. Thus the instinctual energy causes all action and behaviour. Furthermore the aim of all behaviour is to release built up instinctual energy as an attempt of the nervous system to keep equilibrium. If the energy cannot be released it will cause psychological disturbances. This is the basic tenet of the catharsis theory.

Freud believed that the instinctual energy stems from one or several traumatic events in a person's life. These traumatic events and unpleasant experiences make people anxious, and as a result they are pushed into the subconscious part of the mind as an attempt to forget them (Carlson, Martin and Buskist, 2004).

The theory of catharsis builds on the structure of the mind as it was perceived by Freud, that is, the idea of the mind as divided into three parts: the subconscious, the preconscious and the conscious. It is within these parts that memory and the repression of traumatic events take place, and it is here that the psychic energy which fuels our actions is produced³ (Carlson, Martin and Buskist, 2004).

Furthermore Freud divided the mind into three structures: the id, which resides in the unconscious $\frac{1}{2}$ and obeys the laws of the pleasure principle; the ego, which is the conscious self, and acts as a negotiator between the id

³ For more details see Appendix C.

and the superego; and finally the superego, which is the internalisation of societal rules of behaviour⁴ (Carlson, Martin and Buskist, 2004).

Freud believed that the mind is full of struggle; that the different rules between the three structures – *driven by the two primary drives; the sexual instinctual drive and the aggressive instinctual drive* - are aroused, resulting in a conflict. The final result is the adjustment of the ego in the compromise formation.

Dreams are one of the results of compromise formation. Freud believed the manifest content is related with the latent content; when people are sleeping the conscious is weak and the ego control is also weak. The instinctual drive will enter the dream, but express the manifest content. This means it appears after it is created; it changes into another way of appearance.

The instinctual drive is an energy which tries to find a chance to enter the conscious part and control behaviour; to make the behaviour aid the needs of id. But the ego controls the behaviour and the consciousness. However, the instinctual drive continually accumulates energy, and the conflict between the ego and the needs of the id breaks the balance of the system. Eventually the energy grows strong enough to temporarily destroy the ability of the ego to maintain equilibrium; the system will be break and the instinctual drive will appear. After the instinctual energy has been released the system once more regains its balance (Carlson, Martin and Buskist, 2004).

From Freud's point of view aggression is simply the release of surplus instinctual energy towards others. When the quantity of instinctual energy accumulates enough it will appear in aggressive ways, but if we release the energy before it reaches critical quantity, the system will keep the balance and the aggression will disappear. This is known as catharsis.

⁴ For a more detailed explanation of the three structures see Appendix C.

The build-up of instinctual energy is a condition of human existence, and aggression is its natural consequence. According to the theory of catharsis, playing violent video games will release the instinctual energy, preventing aggressive behaviour. Thus violent video games, according to this theory, are not only safe to play, they actually decrease and/or prevent violence.

- *The Mallick and McCandless Study*

According to the catharsis theory playing aggressive games or engaging in other aggressive outlets will prevent potentially consequent aggressive behaviour. Therefore people who have issues with controlling their aggressive impulses will often be asked to express their aggression in therapy sessions, or find another target for their anger to prevent hurting others. Much research, (Mallick and McCandless, 1966, Geen, Stonner and Shope, 1975, Anderson, Carnagey and Eubanks, 2003) however, shows that catharsis does not help; on the contrary, aggressive practice instead increases aggressive behaviour.

“...in the classic test of the issue, Mallick and McCandless(1966) allowed third-grade children to shoot a toy gun after being frustrated by a peer who interfered with a task they were working on. Another group of children were allowed to work on arithmetic problems after the peer upset them. Then all the children were given a chance to express their aggression toward the peer who had upset them. The researchers used a rigged procedure in which children thought they were delivering a shock to the other child; in reality, of course, they were not delivering shocks to anyone. Whether the children, after being frustrated by the peer, had shot the toy gun or worked on math problems made little difference in their delivery of shocks.” (Helherington and Parke, 2003, p. 659)

This experiment clearly does not support the idea that the catharsis can reduce aggression. When we go back to Freud's theory which the catharsis point come from, we can see the catharsis's original function is that when the self- control system at the edge of control then reduce the energy and make the self-control system work again. After the catharsis people will feel better.

The research however shows several conflicting issues. For instance the different ways to collect evidence.

1, Researchers who subscribe to the idea of catharsis believe it reduces aggressive behaviour, yet their 'proof' comes from real life, and is difficult to measure. If a cathartic effect does exist in real life, it would not be subject to study as people would not report it, nor perhaps be aware of the process taking place. Studies to the opposite originate from experiments which are designed by the researcher. The artificial nature of the test means that it is difficult to draw conclusions which are valid in real life.

2, If a cathartic effect does exist it can be difficult to prove as the reduction in aggressive behaviour after a cathartic experience can be too small to measure, and would perhaps only be noticeable if one could check against a reality in which the cathartic experience had not taken place.

3, the aggression level achieved in the test may not be high enough, and thus the psychic energy may not have reached a level at which catharsis is useful. However, catharsis should occur with no regard to the intensity of aggression, as long as it is present. In the above test it does not occur.

From the above our assumption is that maybe when the aggressions range in the low level, catharsis can not show its function. At this stage behaviour

will follow social learning. Aggressive video games will increase the aggression, at this stage people move into a higher stage of aggression, which will trigger catharsis and reduce the aggression.

Desensitization

The theory of desensitization is inspired by the therapeutic tool of systematic desensitization. This is a method for curing for instance phobias by repeatedly exposing the patient to e.g. spiders, while teaching them to relax. The exposure to, in our example, the spider will increase in severity, so that it may in the beginning of the therapy be simply a picture, and by the end, the patient might be expected to hold a real spider in his or her hand. In the end the exposure to the spider, the relaxation techniques, and the realisation that nothing bad happens despite the proximity of the spider will replace the phobia with a feeling of relaxation.

This is clearly linked with behaviourism, and conditioned responses. What takes place in the example with the spider is as much desensitization as it is classical conditioning. Classical conditioning is when a specific stimulus will yield a specific result or response. This response can be changed by conditioning the stimulus, such as in the case of the spider, in which the object of the phobia was linked to a feeling of relaxation. Desensitization is thus a theory which believes in a mechanically determined human being.

Desensitization theory becomes relevant to our project when we begin to deal with desensitization to violence. The following anecdote is by Paul Wilson of Bond University: "Some of the Serbian fighters in Sarajevo said that killing had become so normal to them that they found it hard to imagine doing anything else. When asked whether they would pull the trigger if one of their former Muslim friends appeared in their sights they replied that they would not hesitate to do so." (Evil in the New Millenium - Professor Paul Wilson - A Public Lecture Presented by the Bond Humanities & Social

Sciences Students' Association and the Faculty of Humanities and Social Sciences, Bond University, March 30, 2000)

The connection to violent media is that a person for instance gradually becomes less emotionally influenced by violent scenes exposed to by the media. "...consuming a constant diet of media violence can undermine feelings of concern, empathy, or sympathy viewers (or readers) might have toward victims of actual violence". (Carter, Weaver, 2003. p.8-9)

The argument in this case is that players who are repeatedly exposed to video game violence will become immune to the horror of violence, which as a result makes them less sensitive to the pain and suffering of real human beings. Desensitization theorists also believe that with the proliferation of media depictions of violence, and their increased realism, has caused a significant rise in the degree of desensitization. (Carter, Weaver, 2003. p.9). Some early video games included characters which could not be identified as human, such as Pacman (1980), and crude, stylised violence. Yet video game characters have become increasingly realistic and also more resembling humans. Video game violence has become more detailed and bloody (see i.e. the games Manhunt (2003), Carmageddon II (1998), CS: Source (2004)).

(A screenshot of CS: Source)



While this is due, in large part, to the development of the media, and the ability to create realistic images, the increased details shown in violent scenes cannot be explained solely by the ability to create these details.

This indicates that there may be a circular effect taking place, with audiences demanding more violence because they have grown insensitive to it and need more to elicit the wanted emotional response, and video game developers putting out increasingly more violent games to satisfy the demand they themselves may have helped create. If we look at this evolution in the media, it is not difficult to understand why such a thing as desensitization occurs.

The research into desensitization is difficult to undertake as ethical rules forbid the exposure of direct real life violence to the participants of such studies. This means that experiments must be conducted either with the use of stuntmen, taped acts of violence (which in themselves are ethically suspect, as they would still constitute using real violence for research

objectives) and mock scenarios. While these tests may conclude that desensitization does occur in the viewer when repeatedly exposed to violence, it cannot be excluded that the subjects in such tests are aware that violence is staged. The participants might perceive it in the context of for instance 'entertainment' rather than as something which has real consequences for the 'victim' of the violence.

If the violent situation is recognised as being artificial, the parameters of judging whether or not the victim has been severely hurt may be changed. Just as parameters for the movie violence are different from the ones one uses to judge real life violence. A character in a video game may for instance be perfectly capable of walking around with a gun shot wound in his torso, may in fact be expected by the player to continue to function at near perfect capacity, while a real life gun shot wound in the torso would probably lethally injure the victim. So the problem explored by the desensitization theory only occurs if the player's desensitization to video game violence is translated into a desensitization of real life violence.

For example, television research has demonstrated that people with a heavy exposure to television violence are less likely to take action to help another person who is being victimised. (John P. Murray, "Media Violence and Youth," in Joy Osofsky, ed., *Children in a Violent Society* (Guilford, 1997, pp. 72-96).

The Developmental Psychology Student NetLetter gives the following theoretical explanation of the concept:

"Children can become desensitized to violence and the physical and emotional plight of others by observing television violence. The fight or flight nervous system, innately given to us in order for us to deal with situations of immanent danger, can become significantly suppressed when children are overexposed to violence on television" (Television Violence and It's Effects on Behavior, spring 1998)

- Desensitization Studies

One experiment attempting to prove the desensitization theory was the study by Cline et al.

One group of young boys watched TV four hours or less per week for the preceding 2 years. Another group averaged 25 or more hours per week. When exposed to filmed violence, the high exposure group were significantly less aroused, measured by their physiological response. (Cline, et al., 1973). This shows the effects of desensitization as higher exposure to media and thus to larger amounts of media violence, cause a decrease in arousal when exposed to violence.

A study by Craig Anderson in 2003 (radio show "Todd Mundt – NPR show 1/8/03") proposes a correlation between the use of violent video games and a decrease in prosocial behaviour. In the study he conducted one group was playing a non-violent video game, while another was playing a violent videogame. Afterwards, while filling out a questionnaire, a fight was staged by the researchers in the hallway, and one of the "fighters" pretends to be injured, and the other leaves. They then measured how long it took for the participants to decide to go out and help the "injured" person. The persons who had played the violent video games took longer to come to the aid of the injured person in the hallway than the non-violent game players.

This is by Anderson explained as a decrease in pro-social behaviour (or a desensitization towards the suffering of others), caused by the violent video game. It clearly shows that desensitization occurs as a result of exposure to violent video games, and that this desensitization translates into real life. Video game violence does not only desensitize the player to game violence but to real violence as well.

The General Aggression Model

In order to combine the different theories, we have chosen to implement the General Aggression Model (GAM).

Furthermore, the model is composed and supported by some of the leading researchers in the USA, within the violent video game effects research, Craig A. Anderson and Brad J. Bushman.

GAM can explain long-term and short-term effects of playing violent video games. It presupposes that violent video games teach people aggressive thought, affect, arousal and violent behaviour and goes further in trying to explain *why* this process take place.

GAM was created by Anderson and Bushman as a combination of several earlier aggression theories such as script theory, cue-arousal theory, and desensitization theory together with more recent theories on aggression such as social cognitive theory and social learning theory. Its purpose is to organize and understand the effects of video games.

Quick overview of the GAM

GAM describes an ongoing cycle of interaction between a person and the environment. As we shall see later, the cyclical model of GAM allows long-term effects of violent media to be explained.

Each cycle is composed of four stages with the outcome being either aggressive or non-aggressive behaviour:

- a. Inputs (person and situation)
- b. Routes or the present internal state of the individual (affect or feelings, arousal and cognition)
- c. Appraisal (e.g. interpretation and coping)
- d. Aggressive/non-aggressive behaviour

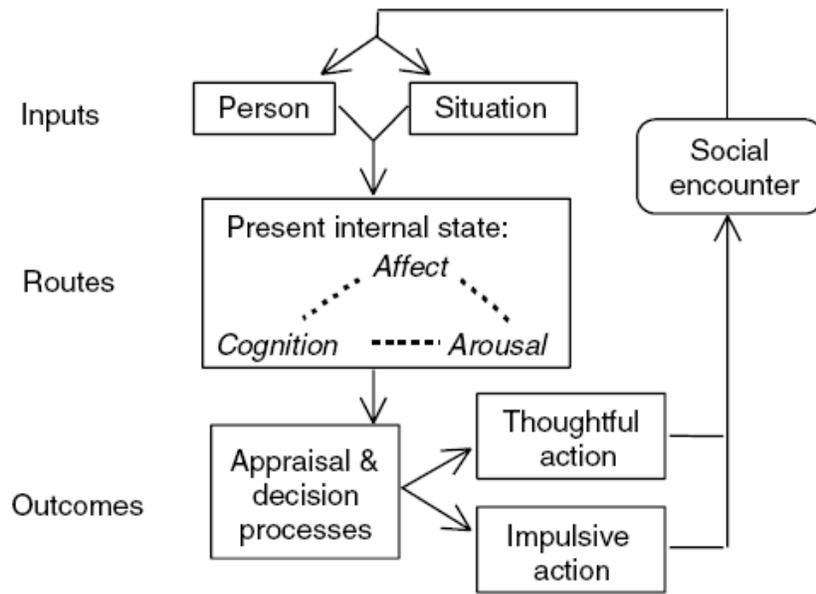


Figure 1 Single episode general aggression model.

Inputs

The input consists of two variables: The person and the situation. Personal variables include traits such as beliefs, attitudes, knowledge structures and more. Situational variables are made of the environment that surrounds the individual. Personal and situational variables provide the basis for a person's behaviour. The behaviour is the outcome of repeated use of knowledge structures such as scripts, beliefs, schemas and affective components (Anderson & Bushman, 2002; Anderson and Huesman, 2003).

More specifically in relation to video games, personal variables include: Sex, age, social problem-solving skills, emotions out of equilibrium, hostile personality etc. (Anderson & Bushman, 2002)

The situational variables make up the environment surrounding the person, and could be media, objects and people. When talking about video games,

situational variables include the game aspects such as: content of game (violent, non-violent), duration of game exposure, type of game (fantasy, simulation, action etc), aggressive cues (weapons and aggressive language), frustration and rewards (e.g. points) (Anderson & Bushman, 2002).

These personal and situational inputs determine the present internal state of the person.

Routes

The internal state is composed of three routes; Cognition, Affect and Arousal. It is via these routes that temporarily or lasting changes in knowledge structures, associations and so on, are made.

Cognition

GAM suggest, that a violent input like a violent game will affect the present internal state by making aggressive constructs easier to access. This process is called associative priming. By repeated exposure to a violent game, the threshold for recalling an aggressive structure will be lowered. Each time a construct has been accessed, the construct will be associated to new words, images and feelings etc. Thus, by seeing a person who solves a situation using a gun, the watcher will store this behaviour in his memory. This memory will be associated to a variety of different situation which could be solved with a gun. This means that a person, who has encountered numerous violent situations in video games to be solved with a gun, is more likely to respond to a similar situation in the real world by using a gun.

Situational variables may also activate aggressive scripts as explained in the script theory.

The script theory states that an ambiguous situation can activate aggressive constructs and thus bias the interpretation of a situation. Thus a person's

outlook on the world will become more hostile. Take for example a college student who is at a party and a guy bumps into him. While that incident might be accidental, the hostile expectation bias of the student will cause him to interpret the action as a hostile action - as if the bump was intentional. So the student's behaviour will be guided by his tendency to expect the worst motive from the other person. Thus, the hostile expectation bias will increase the likelihood of an aggressive behavioural response from the student. This type of aggressive response is otherwise usually only found in aggressive individuals. A study by Anderson and Bushman, which looks into the hostile expectation bias, has revealed that otherwise calm people, when exposed to a violent video game, react to ambiguous social situations with the same level of aggressive thoughts, aggressive behaviour and aggressive affect as aggressive individuals would react (See Appendix E for a description of this study).

Affect

Affect, or feelings, is another internal state that is influenced by the situational input factor. A theory called "mood-congruent memory" explains how cognitive structures of the individual are activated by the present state of affect. As explained by Nicolas L. Carnagey and Anderson; GAM suggests that both aggressive cognitive structures and aggressive feelings are activated by exposure to violent video games. If the person is put in a real situation provoking the same negative feelings as the video game did, the person's aggressive thoughts related to that feeling will be activated. Another example of violent video games related to affect is the mere-exposure effect. The mere-exposure theory asserts that the more exposure we have to a stimulus, the more we will tend to like it.

Studies of this effect by Kunst-Wilson and Zajonc, have shown that repeated exposure to violence in media actually makes it more attractive to the individual

Arousal

The last route to be explained is arousal. This is the only internal state where the question whether a game is violent or not, is irrelevant. The tempo dictates the level of arousal and though not all games are equally filled with tempo; it is true for all games that they cause some level of arousal in the subject - as seen in the Carmageddon Study.

Interaction of routes

The three described routes (cognition, affect and arousal) interact and define the present internal state of the subject.

According to Anderson and Bushman, "Cognition and arousal influence affect and affect influences cognition and arousal. Hostile Cognitions and angry affect may bias which cognitive scripts and knowledge structures people use." (Anderson and Bushman, 2002)

Outcomes

The next part in the cycle of GAM is the various outcomes. The first step occurs when evaluating the current situation before making a decision and performing an action. Depending on the situation, appraisal may be made rapidly and automatically, without much thought or awareness. This results in an impulsive behaviour.

As in most first person video games nowadays, the tempo is fast-paced and time is of essence. Time pressure in the case of a video game, like Grand Theft Auto, might mean that you are forced to behave impulsively and choose the violent solution.

Though, frequently the person will have time and resources to reappraise the circumstances and a thoughtful action will occur.

Reappraising happens because some additional information is needed, and a re-interpretation occurs in order to get a new perspective on the situation. Of course, both thoughtful and impulsive actions can be either aggressive or non-aggressive.

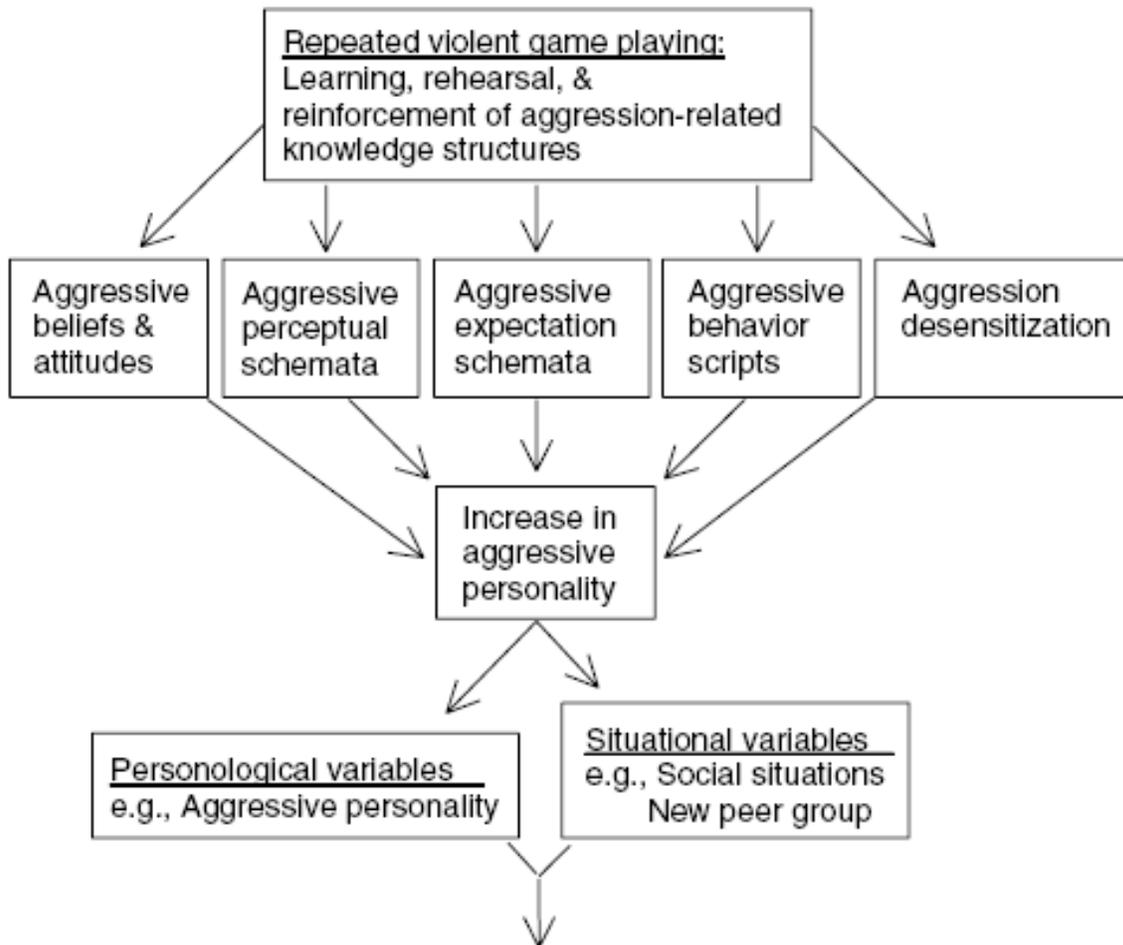
In the long run, as the entire cycle of GAM is repeated over and over again, the aggressive constructs will become an integral part of the players' personality. His view on the world will become more hostile and a wide variety of situational inputs will trigger aggressive constructs. In essence, the person has become more aggressive and the chances of him committing an act of violence have been increased as a result of playing video games.

Long-term effects

This is the basic process of the GAM, but until now the majority of studies have only investigated the short-term effects. The real concern and threat to the society can lie in the long-term effects.

Consider this example; a boy plays violent video games several hours a week. GAM suggests that playing the violent video game will prime the boys' aggressive cognitions, aggressive arousal and aggressive affect. GAM also states that social knowledge structures progress over time. This progress covers learning how to perceive, interpret and judge and respond to events in the environment. Therefore, each time the boy plays a violent video game, he will automatically be on trial to learn that all situations are dangerous and that aggression is an appropriate way to deal with them. When the boy has played several years, he will have gone through the cycle of GAM several thousand times. With repeated exposure, GAM suggests that

the aggressive knowledge structures will have become very complex and chronically accessible at this point. At this point, the boy will essentially have an aggressive personality (Carnagey and Anderson, 2003). This process is illustrated in model 2.



General Aggression Model, as in Figure 1

Figure 2 Multiple episode general aggression model: Long-term effects of video game violence.

Until now, there has only been conducted one long-term study specifically on violent video games. The study was carried out by Anderson, Gentile and Buckley and is not published yet, though it is mentioned in one of Anderson's papers 'Violent Video Games: The Effects on Youth, and Public

Police Implications'. They measured the aggression in 430 third, fourth, and fifth graders at two points over a period of one year. Results showed that the kids had an increased hostile expectation bias and they were more verbally aggressive, more physically aggressive and less pro-social. According to Anderson, Gentile and Buckley, the results of the long-term study are consistent with the effects that GAM anticipated; people do get more aggressive when exposed to violent video games – both short-term and long-term.

The results of exposure to violent video games are similar to those found in violent television studies. Studies made on the effects of violent television have revealed that long-term exposure to violent television does in fact have a notable effect on aggressive thoughts, aggressive affect and aggressive behaviour. While the effect studies of violent television is on some level comparable to video games you cannot draw a direct comparison between the two media. The difference is in the interaction between the media and the subject. Whereas television is an observational media, video games require for the subject to direct all of his attention to the game and participate actively. For example, a first person shooter game requires the player to assume the role of the character and identify with the character in order to complete the game tasks.

- The Hostile Expectation Bias Study

This study was designed by Anderson and Bushman, as a test of the General Aggression Model.

“The present study was designed to see whether a brief exposure to media violence, in the form of video games, can temporarily create hostile expectation biases”. (Anderson and Bushman, 2002, p. 1680)

The idea is that the violent video game will be the situational input (see the input/routes/outcomes figure in GAM chapter) of a person, that automatically primes aggressive thoughts in the present internal state. The theoretical prediction is then that the outcome of this will be a temporary hostile expectation bias.

224 undergraduate students were assigned to play either one of four violent video games (Carmageddon, Duke Nukem, Mortal Kombat and Future Cop) or one of four non-violent video games (GliderPro, 3d Pinball, Austin Powers and Tetra Madness). After playing the game for 20 minutes, the participant had to complete three ambiguous story fractions by stating what the main character of the story would do or say, think and feel. The result was that the students who had played the violent video games would make more aggressive ends to the stories than the students who played the non-violent games. In example, one of the three stories was about a person whose car get hit by another person in another car, no one is hurt.

The students who had played the violent video games would finish the story by writing that the main character would i.e;

“kick the other driver’s car”,
say “what the hell is wrong with you”,
think “this guy is dead”,
think “That bastard”,
feel hate for that guy,
or feel irritated.

These are some of the many different outputs by the students of the violent video games, appearing at the appendix of Anderson and Bushman’s

description of this study. There is no list of the outputs provided by the participants who played the non-violent game.

According to Anderson and Bushman, the study confirmed the assumed idea of the GAM, that the participants who played one of the violent video games would produce “significant increases in expectations that potential conflict situations would be handled aggressively” (Anderson and Bushman Study2002, p. 5). The aggressive content of all three types of expectations (thoughts, feelings and behaviours) was increased.

- The Carmageddon II Experiments

The study performed by Anderson and Carnagey had, according to the authors, three primary purposes: “The first was to examine the effects of reward and punishment for violent actions within a video game on later aggressive cognition, affect and behaviour. The second was to determine whether violent-game-induced changes in affect or cognition seemed to drive any observed elevation of aggressive behaviour. The third was to test the competition alternative hypothesis by using a modified violent video game, one which still contained a competitive aspect, as the non-violent control condition.” (Anderson and Carnagey, in press, p. 7).



(A screenshot from Carmageddon 2)

The study was divided into three separate experiments, measuring aggressive affect (experiment 1), aggressive cognition (experiment 2) and aggressive behaviour (experiment 3). Three different versions of the game Carmageddon 2 were used in each of the experiments. The first version was the original release version, where the goal of the game is to kill as many race opponents and pedestrians as possible, and the player is rewarded for it. The second version was opposite; the driver was punished (losing points) for hitting vehicles and pedestrians. In the third version all pedestrians were removed and the other cars were reprogrammed to behave passively.

The first experiment measured blood pressure, and the number of pedestrians killed while playing. Furthermore it evaluated the emotional response to a variety of words, and finally it called for the participants to rate the game played⁵. The results showed that violent video games may increase aggression regardless of punishments or rewards (Anderson and Carnagey, in press).

⁵ For a more detailed description of the experiments, see Appendix B.

The second experiment was similar to the first, but instead of evaluating the emotional response to a variety of words, it presented the players with word fragments, which they had to complete. These fragments were ambiguous in that some of them could be finished by writing words that were both 'aggressive' and 'non-aggressive', such as KI_ _ which among other can be finished thus: KIND or KILL⁶. Experiment two revealed that "...rewarding violence in a video game increased aggressive cognition, whereas punishing game violence led to aggressive cognition levels that were about the same as in the non-violent game." (Anderson and Carnagey, in press, p. 13)

The third experiment is similar to experiment two, except that the word fragmentation task was however replaced with a competitive reaction time task, in which the participants and their partners would compete about who was faster to press a button when hearing a sound. The loser would receive a burst of white noise. The intensity and duration of the noise the partner would receive was controlled by the subjects themselves, and functioned as a measure of their aggressiveness ⁷(Anderson and Carnagey, in press).

The results of experiment three was that participants who played the reward violence video game were more aggressive than the participants playing the punish game and the non-violent game participants. Men were higher in aggressive behaviour than women. In sum, experiment three demonstrated that rewarding violent actions in video games increases aggressive behaviour, compared to punishment and non-violent versions of the same competitive game.

⁶ See Appendix B for more details.

⁷ For more information see Appendix B.

From this study it seems obvious that violent videogames promote aggression. However one must ask whether this is because of the vide game itself or whether it is simply a result of socialisation:

Video game	Violence Possibility	Punishment	Rewards	Subsequent Behaviour
Carmageddon II (unaltered)	Yes	No	Yes (yes*)	High Aggression
Carmageddon II (Punish)	Yes	Yes	No (yes*)	Low Aggression
Carmageddon II (Non-violent)	No	N/A	N/A (yes*)	Low Aggression

(* all three versions of the game function with rewards, as they are essentially car races, in which the fastest driver wins, and thus gets to graduate to the next level.)

It is unclear whether it is the games or the aspect of punishment and rewards which cause the subsequent behaviour. As it is, most violent games reward acts of violence, and would thus according to this test lead to heightened aggression in the players. To eliminate the aspect of socialisation through punishment and rewards one would have to conduct the same experiment with a version of the game that offers neither rewards nor punishments.

Methodological Critique

In this chapter we will examine some of the methodological issues arising when utilising and analysing different types of empirical research. We will discuss the problems of using quantitative or qualitative research approaches, as well as the issues arising from laboratory research vs. observation. Laboratory experiments have been favoured as a way to isolate a specific factor, supplying the test group with for instance a video game, while keeping a control group in similar conditions without access to video games. In theory all subsequent differences in behaviour can be traced back to one isolated factor (i.e. video games).

There are however several problems with this approach, not the least of which is the fact that a laboratory setting is not always conducive to normal behaviour. Subjects are asked to play specific games at specific times, in specific intervals. These experiments largely fail to take into account the social circumstances which surround the real life gaming situation, and take place in an unknown environment. (Gentile and Anderson, 2003) These factors lie outside the control of the subject, and beyond the stress induced by this, the subjects are also aware that they are being monitored. To claim that experiments which alienate the player to such a degree conveys any realistic knowledge of the normal behavioural changes experienced or/and exhibited by the player seems hardly plausible.

Observation of the subjects as they interact in real life as favoured by anthropologists also bears its problems. While the situation for the subject is much less anxiety provoking, and the entire social environment surrounding the activity (playing video games) is left intact, there are problems in analysing the findings. Rather than having a single isolated factor, the scientist is looking at a plethora of factors, all contributing to subsequent behaviour/behavioural changes (This is of course a problem which arises

from the laboratory experiments as well, although in that case they are consequences of the setting itself, namely the attempt to exclude distracting information). This of course makes it extremely difficult to contribute changes to one factor alone, and thus makes it hard to reach any form of unquestionable conclusion on the effects of e.g. video games.

All of the studies presented above are either conducted within a laboratory setting or conducted as tests, requiring participants to achieve certain goals. This means that all results originate from simulations of real life behaviour and situations. This, however, is problematic when one tries to generalise the findings, to explain real life behaviour. Lab experiments have traditionally been criticised for several reasons like; "...demand characteristics, participant suspicion and compliance problems, trivial measures, artificial settings, and unrepresentative participants." (Gentile and Anderson, 2003, p. 148).

According to the Danish researcher Carsten Jessen, laboratory experiments are invalid because of the above considerations and thus he presents an alternative method.

He has a great deal of experience researching children and the effect that video games have on children (Jessen 2001, p.28). Jessen claims that there has been too much focus on how computers are replacing social activities and are creating individualization and isolation. He believes that this is a result of the studies that have been done by researchers who are unaware of how the game and/or play culture has changed since their own youth. Jessen's empirical studies are built upon participant-observation, a method which is at the centre of ethnographic work according to Hammersley and Atkins (Jessen 2001, p.28).

“In its most characteristic form, it involves the ethnographer’s open or hidden participation in the daily lives of people through an extended period of time. He or she must observe what is happening, listen to what is said, ask questions – in short, collect whatever available data, which can shed light on the problems which are they focus of the survey.” (Jessen, 2001, p. 28, our translation).

Another reason for the fallacious belief that video games are replacing social activities is according to Jessen that many of the researchers which have conducted the surveys are making the mistake of comparing the role of the activities of the children to their own activities. Consequently they find the activities of the younger generation lacking compared to their own (Jessen 2001, p.12-17). Jessen believes that there has been a change in the role fulfilled by playing, of which the older generation is unaware. Jessen mentions that Cline and postman are of the opinion that children’s activities have reduced both quantitatively and qualitatively. (Jessen 2001, p.31)

In 1989 to 1991 Jessen was employed as an instructor in a workshop called “datastuen”. The participants were largely children, age 6-14, even though the project started as a workshop for everybody. As an instructor his position was that of an adult, but his role was not defined traditionally through a child/adult relationship, as he was also a participant in the activities of the children. His participation differed from the traditional way as well; he was just as enthusiastic about the games as they were. He knew a lot about hardware and the children knew about software, thus they had a balance and used their “expert” knowledge in the different areas to supplement each other. Jessen did not formally interview the children, nor did he take notes while observing them. In other words he did not have to create a situation to get into a dialogue with them, the dialogue was already there (Jessen 2001, p.33). According to Jessen, Hammersley and Atkinson

define the role as an observer of being either total participant or total observer. The total participant becomes a member of the group he observes without telling the observed members of the observation he is carrying out. Jessen agrees that this role fitted well with the role that he undertook in "datastuen", still he allows for the fact that he did not have a full membership with the other members, even though he was involved in their activities. Yet Jessen acknowledges that total acceptance and integration into the group of children was unfeasible despite the role he took, simply because of the fact that he was an adult observing children (Jessen 2001, p.34-37).

The reason for why Jessen is generally involved in his projects for long amounts of time, is because he believes that it is impossible to just make general conclusions upon things that have only been studied for a couple of days or hours. He believes that a subject demands more time than that, to get a full and detailed understanding of all of the aspects. His research method "the total participant" is one that acknowledges and accepts these factors, and will likely give a thorough understanding of the subject studied. It is however in its basic structure a method which demands large amounts of time from the researcher undertaking a study.

Discussion

This is meant as a starting point for a verbal discussion, since we do not here have the space to include all facets of the discussion surrounding violent video games and aggression.

In this chapter we will answer the secondary questions one by one, through a discussion and comparison of the theories. First we will summarize the key points of the theories used, and then we will discuss their merits and drawbacks, in the hope of pointing out a single theory which best illuminates the question of video game violence and its relationship to real life aggression.

Is it possible that some real life violence is carried out by people *copying* video game violence?

According to the theory of modelling the answer is yes - video game violence may be copied by people in real life. This modelling can take on two distinct forms. Imitation of a specific act of violence, or modelling, which functions through a system of cognitive selections. The Bobo doll experiment (Bandura, Ross and Ross, 1961) showed how children exposed to violent models imitated acts of specific violent or aggressive behaviour. In that case the model functioned as a form of manual and taught the children novel forms of behaviour. Violent video games too, can teach novel forms of behaviour which can then be used as a recipe when the player later acts out violently. It is a question of simple imitation, in which negative or positive sanctions have no bearing on the subject's likelihood to imitate the action. Modelling occurs when a subject perceives a specific action as positively sanctioned, and wants to achieve the same rewards by modelling the action. This could apply to a character in a movie who smokes - a character, which

is perceived by the viewer as a positive role model. Conversely, the character could also be the bad guy. Modelling of this kind can occur when the model is defined as a bad guy by social standards, if the viewer perceives him as a positive model, despite outside definitions. In this case smoking is linked to a model which receives positive attention, or is perceived as having positive attributes, and thus the viewer might copy this behaviour to gain some of the rewards awarded to the model, or to identify with the model. Considerations of this sort may be one of the reasons why the comic book character Lucky Luke (first published in 1949) replaced his trademark cigarette with a piece of straw in 1983.

The same applies to video games in which violence is rewarded, or in which the character carrying out the violent behaviour is perceived as positive.

Of modelling and imitation, imitation is the more problematic, as it concerns novel behaviour which is much more readily copied, than for instance previously known behaviour which is modelled selectively. This is further illustrated by the study on TV and violence carried out by Joy et al.⁸ (quoted in Roberts and Bachen, 1981) which showed that violence increased markedly when a town, which previously had no access to television was introduced to television. Two towns with prior access to TV showed no increase in violence during the study. This may be because the violence shown on TV was no longer novel, and thus copying it depended on a selective process. This means that violent video games which introduce new ways of killing or hurting characters allow for easier incorporation of the behaviour.

Just like modelling, GAM would answer yes to the question of copying video game violence. As this theory incorporates parts of both modelling and

⁸ See appendix B for details.

desensitization, it theoretically has even broader implications than modelling. Not only would video game violence potentially be modelled, the modelling would be coupled to desensitization. This means that the player might not be as sensitive to acts of violence - which in turn could lead to an escalation of the modelled violence.

However, while the Bobo doll study (linked to modelling) has shown imitation in reality, both the Carmageddon study and the Hostile Expectation Bias study (linked to GAM) fail to show imitation of aggressive behaviour as a result of video games. This could be because the subjects used are older, and thus their cognitive structures are more developed, meaning that a cognitive selection process is more likely to occur than in the three- to five-year-olds used in Bandura's study. Another conclusion could be that the situation staged by Bandura did not demand that participants act violently to other humans, and that the environment in which the model performed was replicated for the participants. Still, while the GAM theory supports the idea of video game violence being copied, tests to this do not support the theory, but instead show the presence of increased aggression after playing.

Can violent games decrease real-life violence?

No, violent games do not decrease violence in real-life. Several studies have disproved the catharsis effect.

The catharsis theory suggests that a person who vicariously experiences and/or sympathizes with acts of aggression or violence, will release the aggressions he has built up over time. This will cause him to return to a state of emotional equilibrium allowing room for the build-up of more aggressive thoughts, feelings and arousal before catharsis will become

necessary again. According to catharsis, if it does not occur, aggression or violence will.

The classic catharsis study by Mallick and McCandless (1966), designed to prove catharsis, was unable to show any trace of catharsis. Also, studies by Anderson and Bushman (2001, 2002) have revealed increased aggression in the subject after exposure to violent video games. Both of these studies only investigated short-term effects.

However, the idea of catharsis is that psychic energy is built up over a long period of time before it reaches critical level, and it becomes necessary to release it. This release could happen by identifying with a character, like in a video game. Conversely, you could act out your built up energy physically, as for instance in the case of the Columbine school massacre. Since studies of catharsis have only been conducted short-term, it is reasonable to speculate that catharsis would be present to some degree when conducting a longitudinal study.

Furthermore, the original idea of catharsis, as Aristotle explained, was to identify with the characters; feeling their anger, sorrow and to sympathize with the characters through mimesis⁹. With the introduction of video games, people got a chance to interact with the media. They were no longer just observers, but could control the character(s) and ultimately, the outcome of the game. With the first-person shooter genre, the subject no longer had to work as hard to identify with the characters as with television or theatre. The interactivity of the video games should have a greater impact on release of physic energy than would any other media.

⁹ The reality-mimicking quality of art

But studies by Anderson have proven otherwise. Instead of decreasing aggressive thoughts, affect and arousal, studies showed just the opposite. Aggressive thoughts, affect and arousal increased. It would then be likely that people playing violent video games repeatedly, would build up psychic energy rather than release it. The catharsis theory claims that at some point, this energy has to be released to keep emotional equilibrium; if not released, the build-up will result in violent aggressive or violent behaviour.

Yet it would be impossible to track a causal relationship between psychic energy and behaviour. Psychic energy is a fuzzy and ambiguous term, as neither its effect nor cause can be measured objectively. Even though a violent or aggressive outlet is observed, lots of different factors could have caused this behaviour.

So even though the theory of catharsis might sound reasonable, it has been disproved by numerous studies.

Can violent video games lead to a desensitization of the user?

The answer depends on how you understand the question. If the question means that violent video games cause desensitization to video game violence, the answer is yes. This is because the desensitization theory gives a reasonable explanation for how continuous exposure to video games will gradually lead to a player becoming increasingly emotionally numb to violence.

One study which confirms this is for example Cline et al.'s study, which concluded that children with high media exposure will become less physiologically aroused by watching filmed violence.

Furthermore, we have concluded that increased graphically realistic violence

in games might increase the desensitization of the player. The increase in violent graphics may be a result of players being desensitised to video game violence, thereby creating a market for even more violent and realistic games

However, if the question is understood in terms of violent video games leading to a desensitization of the player to real life violence, the answer is a bit more ambiguous. The answer is yes according to the previously mentioned study by Cline et al. where players of violent video games were slower in coming to aid to a suffering person than players of non-violent video games (see Desensitization Studies).

The violent video game made players desensitised to real life violence, thereby altering their interpretation of reality. The non-violent video game players maintained their original interpretation of violence and thus perceived the situation as serious. This enabled them to react fast as they were more alarmed. According to the desensitization theory, the violent video game players had had their definition of violence altered, therefore not interpreting the situation as serious as the non-violent game group, in consequence slowing their reaction.

However this reluctance to act quickly may not be a result of desensitization, but instead of a negative interpretation of the situation. Playing violent video games might cause more readily available associations to violence, increasing their fear of being hurt themselves, resulting in less pro-social behaviour. Or they may judge the victim's injuries to be worse than they are, and thus feel inadequate to offer help.

If we take this example out of the laboratory and into a real life situation, we might be able to draw some more general conclusions. Imagine a traffic accident where a bicyclist is hit by a car and lies, bleeding on the ground. The theory of desensitization would expect violent video game players to react differently from people who had not been exposed. Further, we expect the level of desensitization is determined by the amount of violent games played.

A subject who has played a large amount of violent video games would be desensitized and thus be less likely to react to the accident. While a subject who has played less, would be expected to show more pro-social behaviour. According to this theory, a person not exposed to violent video games would be sensitive to the situation and provide help to the injured person. However, while this works in theory, other factors might influence real life situations. For instance; a person not desensitized might still not be able to help the person if he was in shock or afraid, and thus not able to handle the serious nature of the situation. This might mean that studies of desensitization might mistakenly label people in shock as desensitized.

Of course, other factors like knowing the person and fear of being hit by a car oneself might change the behaviour of the involved persons. For example, the likelihood of a person who is completely desensitised to all forms of violence to react on a violent situation would probably be higher if he is emotionally connected to the victim of violence (e.g. the bicyclist).

A desensitised person might become immune to the horror of the situation, and thus be better able to help the victim.

So desensitization to video game violence does not necessarily lead to a desensitization of real life violence. If it does, real life violent acts by

desensitised players might be more violent than normal forms of violence, because their understanding of what constitutes violence is lower.

However, despite the potential problems with the studies concerning video game violence and desensitization, they do show a causal line between violent video games and short term, real life desensitization.

Do rewards and punishments in video games alter the (potentially violent) reaction of the players?

Yes, modelling claims that rewards and punishments does matter in videogames, and influence the likelihood of a player modelling specific behaviour. Many games, if not all, include rewards and punishments as a part of the game play. Often rewards are given for violent behaviour such as shooting enemies, or driving into pedestrians. These sanctions (whether negative or positive) might influence the potential aggressive behaviour exhibited after playing.

Theories on aggression tend to focus much on the rewards. However, punishment effect is not discussed as much when comparing the two effects. This might be because a reward is the most popular sanction in video games. But we believe both of them to be equally important, for two reasons. Both rewards and punishments can function to increase or decrease violent behaviour. If an action in a video game, such as shooting someone is negatively sanctioned, perhaps resulting in the loss of points, then the result will most likely be a discontinuation of the behaviour. However, a negative sanction may be interpreted as positive, if for instance the player is trying to impress friends by shooting innocents, or if he finds it entertaining, even though it will lead to the police arresting his game character. In that case

the negative sanction within the game, will not work as intended, and the behaviour will be continued.

Positive sanctions too can work both to increase or decrease behaviour. If for instance the goal of a game is to kill criminals, which will award the player with money, then the player will be inclined to kill criminals, to gain the reward. This behaviour will likely be repeated. However if the player interprets the sanctions as negative, or if other factors prove more powerful than the reward, for instance his friends encouraging him to kill the hostages instead of the criminals, or if he identifies with the bad guys, then the positive sanctions will be interpreted as negative, and the action discontinued. This can be seen in our illustration.

For these reasons we believe that it is important both to differentiate between the two effects but at the same time focus on the fact that it does not matter whether or not it is negatively or positively sanctioned, as both types of sanctions can result in increased or decreased aggressive behaviour. Still despite the possibility of sanctions being interpreted differently than intended, they do have a clear influence on the behaviour of the player as shown in the Carmageddon II study (Anderson and Bushman, 2001).

However it should also be mentioned that aggressive behaviour can also be a result of pure imitation, in which case the presence of rewards and punishments becomes irrelevant. Yet this type of modelling does not impact on the level of aggression in the player, but simply provides the tools with which he or she can chose to act out aggression or violence when it occurs.

There are some similarities between how the observer interprets (decodes) a situation in both GAM and modelling. In GAM this is called the appraisal process, a process which can lead to thoughtful or impulsive actions, depending on the routes accessed. If resources are sufficient this will lead to an impulsive action. If this action is unsatisfying, a reappraisal will occur and this will lead to a thoughtful action. A decision will be made and a reaction from the environment will follow, whether that is the environment in a video game or a real life setting. The social encounter will alter the input variables depending on how the environment has responded. And thus this can lead to reinforcement or inhibition as modelling also mentions. What modeling fails to explain is the situation factor that GAM explains. This factor accounts for the fact that there are environmental factors, which can influence the learning experience in another direction than if it was "learnt" under "normal" circumstances. The variable factors are the situation and the social encounter. However there is also a difference in the appraisal and decision process which makes the theory bit more extended than modeling. And if the environment rewards your actions, you are more likely to follow the cycle again. However if they are punishing you for your actions, you are most likely to stop the behaviour, even though this does not always happen.

When talking about rewards and punishments there are other factors that can interplay with what the solution will be. First let us look at what happens before that. We may play a videogame over and over, repeating the behaviour in the game, then a script is developed, which guides your behaviour according to what has been repeated. If something triggers this script in the real world, one is more likely to repeat that script. However there is the opportunity of this not happening, and the following example we are about to give, we feel is of great importance as to understand why scripts are not always followed: First of all, a person moves through different

groups for different purposes: a work group, family, friends, political party friends, sport buddies etc, some of which overlap. Certain behaviour that is accepted in one group might not be accepted in another group, and that is why we reason that the person might conclude that a behaviour is positively sanctioned, but the person is not able to act out this behaviour as the behaviour is not positively sanctioned in some of the other groups that the person belongs to. So whether or not behaviour is acted out not only depends on whether or not it is negatively/positively sanctioned but actually depends on which groups he is socialised with. Even though a person can perform the behaviour in one or more groups, and it is accepted behaviour among these groups, the person might not perform as it would damage the relations to other groups. This is the social aspect and the risk of losing face in one or more groups, as the groups all have different values ascribed and a person has to adapt to the groups in which that person moves. This means that the person has to consider if it would damage his/her position in that specific group, and act after the values ascribed to the group in which he/she is in at the moment of where the observed behaviour may be modelled. From this follows that sanctions within a video game is not the soul factor, when deciding whether an action is carried out. Thus punishments and rewards do not necessarily influence potential aggressive acts on the part of the player, although as mentioned previously, they do more often than not impact the consequent behaviour.

Does aggressive behaviour lead to violent behaviour?

We have chosen to incorporate this question into our project, as we feel it is essential to answer it in order to achieve a full understanding of the consequences of playing violent video games. While we cannot answer the question through our theories, as they do not show a clear causal link between aggression and violence, we want to propose a study into the

correlation between aggression and violence, as a potential causal link between the two would have consequences for how one should view violent video games.

“Violence refers to extreme forms of aggression, such as physical assault and murder. All violence is aggression, but not all aggression is violence” (Anderson and Bushman, 2001, p. 354). We feel confident at this point to conclude that violent video games do cause aggression in the player. However this aggression seems to be short term, and little is known of the long term effects of playing. But if there is indeed a causal link between aggression and violence, then school massacres like the one at the Columbine high school in Littleton, Colorado, could be linked causally to violent video games. We must then conclude that violent video games potentially endanger human lives. Our current knowledge, however, does not allow for this extreme interpretation of our findings. Still, in light of our findings we feel we would remiss if we were not to suggest further study into this area.

Conclusion

When we began our study into violent video game research, we wanted to find the answer to the question of whether or not playing violent video games increases aggressive behaviour. Through our studies we have found the answer to be positive.

As we have shown above, violent video games do cause short term increased aggression in players. While some of our theories refute this conclusion, these theories have not been backed up by empirical research. The studies supporting the conclusion show a clear causal link between

video game violence and increased aggression, and are of such a nature that we have become persuaded by their results, despite of some methodological issues within certain studies.

In the process of answering our secondary questions, we have found that acts of real life violence may be a result of copying video game violence. We have also found that playing violent video games can lead to a desensitization of the player. This may mean that the inhibitions against performing acts of violence or aggression are lessened. We have also found that violent video games can not cause a cathartic reaction in a player. Further, we have found compelling evidence that rewards and punishments influences the reactions of a violent video game player. Most violent video games incorporate a system of rewards for violent acts; this means that players will become aggressive.

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Appendix A - RUC Information.

Dimension

In this project we will work extensively with psychological theories and methods, placing the project within the subjectivity and learning dimension.

Language Policy

We will write the project in English. Our main source material will be English, as will the internal language of the group, since one of our group members does not speak Danish. Quotes from Danish material will be translated into English if used, for the same reasons.

Time Management

We will try to meet once or twice a week at first, increasingly as time goes by. We will mainly meet in Roskilde or at RUC. Because of the relatively small size of our group we are hopeful that we will be able to meet often with all group members present. We will communicate through Messenger, BSCW and mail. Also we will all do our 'homework' that is reading the articles, books, etc. agreed upon prior to each meeting.

Group Work Process

We all started out with the same basic ideas of what we wanted to do in this semester project. We all wanted to look into how one conducts a good empirical study when examining video games and if we had the time we wanted to perform an actual empirical study built upon what we had discovered when examining already performed studies. We all found the subject of video game research interesting. During the first months we all seemed to be dedicated to this project, but we somehow during this last month up until delivery of project, lost a little bit of our attention. We did however meet during the last month, but when we met we were not wholly focused and we did not produce as much as we could have. Therefore we were "forced" to write the last part of our project in a somewhat of a hurry. We realise that we may not have the time to read corrections on the project as many times as we would have liked. Another critique point is that we have not been able to agree upon which of the theories was most important and even if we should have included some of the theories.

However, during the last two weeks, we increased our daily time spent on the project and caught up the lost. We have had many discussions, which have given us a deeper insight into the problems and issues of the studies and theories used, and are now satisfied with the final report and the group process.

English Abstract

This project is about violent videogames and their impact on players. We have investigated how they both can form aggressive thoughts and feelings and how this can lead to violent acts. We have chosen to incorporate Modelling, Catharsis, Desensitization and the General Aggression Model to investigate how they specifically can answer the posed questions. The content of our project is furthermore both a theoretical and methodological critique of the mentioned theories and studies. All this should give the reader a general understanding of whether video game violence increases violent behaviour.

Danish Abstract

Dette projekt handler om voldelige computerspil og deres påvirkning af spillerne. Vi har undersøgt hvordan de både kan forme aggressive tanker og følelser samt hvordan dette kan føre til voldelige handlinger. Vi har valgt at bruge Modelling, Katarsis, Desensitization samt den Generelle Aggressions Model til at undersøge hvordan de hver især kan besvare de stillede spørgsmål. Indholdet i projektet består derudover af både teoretisk og metodologisk kritik af de nævnte teorier og studier. Alt dette giver læseren en generel forståelse for om hvorvidt vold i computerspil fører voldelig adfærd.

Appendix B - Studies

Anderson and Carnagey (in press)

(Elaboration on Carmageddon II study.)

Three experiments were carried out, each using three versions of Carmageddon II; one rewarding violence; one punishing it; and one in which violence was not possible.

Experiment 1:

43 male and 32 female undergraduate students participated.

The participants were randomly assigned to each version of the game and a blood pressure cuff was placed on the arm. After 20 minutes of gaming, the participants completed a State Hostility Scale (SHS). SHS involves rating feelings on a variety of words (e.g. furious, aggravated and angry). Afterwards the participants rated the game (e.g. boring, frustrating, fun, arousing and violent). Also, the number of killed pedestrians was counted.

According to Anderson and Carnagey, the results were "...that violence in a video game, regardless of reward or punishment, can increase hostile affect. This occurred even though there were huge differences in the body count between the reward and punish conditions, suggesting that increased hostile affect was not a direct result of active attempts to kill game characters." (Anderson and Carnagey, in press, p. 11)

Experiment 2:

29 male and 37 female undergraduate students participated.

The procedure of study 2 was identical to study 1, except that the SHS were replaced with the Word Fragment Task (WF). The WF requires the participant to complete as many word fragments (of 98) as possible in five minutes. Half of the word fragments contained aggressive possibilities. For example, K I _ _ could be completed as "KIND", "KISS", "KICK" or "KILL".

When the test is done, aggressive cognition was calculated by dividing the number of aggressive word fragment completions by the total number of word fragment completions.

Experiment 2 revealed that "...rewarding violence in a video game increased aggressive cognition, whereas punishing game violence led to aggressive cognition levels that were about the same as in the non-violent game." (Anderson and Carnagey, in press, p. 13)

Experiment 3:

68 male and 73 female undergraduate students participated.

Participants were told that their job was to form an impression of another person via various tasks. The participant was told to write a brief essay on the issue of abortion, supporting whichever position they chose. After five minutes the essay was taken, and the participant was presented with the handwritten essay of their fictitious partner, which would support the opposite position of their own. The viewpoint of the partner's essay was opposite the one in the participant's own essay. The participant then read and evaluated the essay, using a scale of -10 (poor) to +10 (excellent) on various set dimensions which also allowed for creative comments.

Then the participant played one of the three videogames for 20 minutes, and body count was recorded by the experimenters.

After the 20 minutes, an essay evaluation that supposedly was from the "partner" was returned. The evaluation was very negative, giving -9 or -10 on all dimension of the essay and with a comment which stated: " 'This is the worst essay I have ever read!!' " (Anderson and Carnagey, in press, p. 15)

After reading the evaluation, the participant played the CRT (Competitive Reaction Time) task and completed a videogame evaluation form. CRT

participants are told they are competing with another person to see who can press a mouse button first, after hearing a sound. The loser of each trial receives a burst of white noise. Participants select the intensity level and the duration of the noise they want their opponent to hear, before each of the 25 trials. These selections constitute the measure of aggressive behaviour. The CRT of Anderson and Carnagey's experiment was pre-programmed for participants to win 13 and lose 12 trials.

Anderson & Dill (2000, as found in Medierådet's Report)

Participants: 227 psychology students, with average age of 19 years.

Method: The participants wrote themselves about their aggressive behaviour level, crime level and their general perception of the world. Furthermore, their grades and results from their study was recorded. Finally, the participants told about their favourite games, how much time they spent on gaming. All this data was compared by the researchers.

Results: Much time spent on violent video games was proportional with high crime and low grades. This connection was especially visible for men and individuals with aggressive personality.

Durking & Barber (2002, as found in Medierådet's Report).

Participants: 1304, average age was 16 years.

Method: Data was collected (in 1998) via questionnaires, psychological tests and school results. The participants were divided into three groups in accordance to time spent on video games; none, low and high.

Results: Bad mood was occurring at the same frequency for the "none" and "high" groups, but the level was decreased in the "low" group.

Self-worth was highest in the "low" group, but the self-perception of intelligence, mechanical abilities and computer skills was highest in the playing groups, especially in the "high" group.

The “none” group reported more disobedience and lazing than the playing groups.

Both playing groups reported to have low-risk friendships and higher connection to the school.

There was some indication of increased aggressive behaviour in the “high” group, but no significant differences.

This study is not focusing directly on violent video games, but the conclusions are still applicable here. It seems like the participants of the study who spent a low amount of time on computer games was the happiest students, with a big self-worth and a high connection to the school. This conclusion challenges the conclusions of other studies (e.g. Anderson & Dill, 2002) that propose a direct correlation between time spent on video games and aggression/social isolation. According to these, even a small input of video games would change the player in a negative way. Therefore the “none” group would be supposed to be the most successful group, which is not the fact in this case.

It is also recognisable that the sample size of the participants is the highest we’ve seen so far, in a study within this field.

Joy et al., quoted in Roberts and Bachen (1981)

Joy et al. carried out a study on the effects of media violence. They took advantage of the introduction of television into a community previously isolated from television.

This was performed by observing the changes in aggressive behaviour of children in three towns over a period of two years from 1973 until 1975. At the beginning of the study, town number one had no television, town number two had one channel and town number three had cable with lots of channels. After introducing town number one to television, aggressive

behaviour rose among both boys and girls. The two towns nearby, experienced no such increase over the two years in which the study was conducted.

Roberts and Bachen note that: "Cross-sectional data also indicate a dramatic increase in aggressiveness among children just receiving television, an outcome interpreted by Joy et al as possibly due to a "disinhibiting" effect rather than to the cumulative impact of viewing." (Roberts and Bachen, 1981, p. 341).

Lynch et al (2001, as found in Medierådet's Report).

Participants: 607 students, averaging 14 years.

Method: The participants filled out three questionnaires/tests about video gaming habits, hostile expectations and hostility.

Results: Among other results, the interesting results for us were that the students who played more than others for several years or buy video games, are more frequently involved in physical fights than other students. Furthermore, the players who play or prefer video games with violent content have a more hostile interpretation of their environment than others. The participants who play to let of their anger perceived the world as a more hostile place, was more often in a conflict situation with a teacher, had increased hostility, were more often involved in physical fights and had poorer school performances. These factors was reduced whenever the children or their parents made an effort in limiting the time spent on video games.

Robinson et al (2001, as found in Medierådet's Report)

Participants: 3rd and 4th grade students on two schools.

Method: Participants was randomly assigned two groups. The first group continued their normal media use while the second group received six

months of education in reducing TV and video game consumption. That education was based on Bandura's Social Learning Theory.

Results: The group that was educated in decreasing their media use was by their friends perceived as having decreased verbal and non-verbal aggression. This group also had a tendency (even though it wasn't statistically significant) to demonstrate less physical aggression and not perceive the world as threatening as before.

Appendix C - Catharsis

Freud claims the mind includes three parts: subconscious, preconscious and conscious. The subconscious includes mental events of which we are not aware, the preconscious is the part we are not aware of but can be aroused/activated through effort. The conscious is the part we remember and know clearly. Freud describes the mind like an iceberg where a small part is above the surface and the larger part is below. He believed that people's behaviour is controlled through the subconscious; the part beneath the surface. People may act without knowing the reason - an automatic reaction, which cannot be explained by the subject itself. The mind is controlled by the subconscious and fuelled by instinctual energy. The subconscious controls the human behaviour through conscious thought and action.

Traumatic events will be pushed into the unconsciousness because the memory will arouse too much anxiety and make people uncomfortable. But the traumatic event still exists in the unconscious; it still affects people's behaviour. Thus a newly discovered symptom which cannot be directly linked to any specific, conscious reason may stem from a traumatic event 'remembered' by the unconscious.

Freud divided the mind into three structures: the id, the ego and the superego. The id is in the unconscious part and it has the instinctual energy-libido, id only obeys the pleasure principle. The id tries to get everything that the body needs immediately, and all of its energy is used to pursuit this aim.

The ego is the self; it controls the behaviour and adjusts the conflict between the id and the superego. The ego obeys the reality principle, trying to satisfy the needs of the id and control the id yet making the behaviour follow the social morals. The superego is subdivided into the conscience and the ego-ideal. The conscience is the internalisation of the rules and restrictions of society, the ego-ideal is perfection; the goal which any person tries to achieve.