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THE INFLUENCE OF DIGITAL GAMES ON AGGRESSION AND VIOLENT CRIME

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To an external observer, the events and actions which take place in a video game can appear bewildering. The screen may be covered in luridly colored and fast moving objects. The player (if we can work out who or what that is) dashes frenetically from one place to the next, seemingly without purpose. And all of this is accompanied by explosions, shouting and screaming, and often a thumping soundtrack. Small wonder that such activity sometimes seems alien to the uninitiated, especially when it is chosen in preference to more traditional social, physical, and intellectual pursuits.

This leads us to our first question regarding video games. Why do people, and particularly younger people, like them so much? Section one of this chapter begins by asking this question, which has some interesting and revealing answers. In particular, having established why we like to play games, we will present an account of why violent video games (VVGs) have come to occupy such a dominant position in gaming. In section two we take a close look at these concepts, and consider how to accurately and sensibly measure them so that the conclusions from our research can say useful things about how parents, the media, and society should treat VVGs. In section three, we identify some of the key controversies, and present a 'research evaluation toolkit' which is intended to be a simple set of questions that anyone can use to evaluate new research when it is presented (often uncritically and using provocative and even alarmist language) by media or scholars themselves. Section four asks whether we should be concerned about violence in VVGs, or whether in fact there are other more important things to worry about (spoiler alert: we think violence in games is not the problem, but there might be other problems that are worth investigating and considering). Finally, section five considers the broader implications of the discussion, considering among

other issues why politicians and media consistently misrepresent the findings of research on VVGs.

Examining the Motivation to See So Much Violence in Gaming

General: Conan! What is best in life?
Conan: To crush your enemies, to see them driven before you, and to hear the lamentations of their women.
(Conan the Barbarian, 1982, dir. John Milius)

One important point to establish, which has been made many times before but which bears repeating, is that gaming is not a minority activity. Recent evidence[1] suggests that more than half of Americans play games, and have at least one gaming console in their homes. Among children the numbers are even higher, with almost all boys playing video games and smaller majority of girls playing as well.[2,3] Women are almost as likely to play video games as men, and adults are as likely to play as children and adolescents. A third of American parents play video games with their children at least once a week, and just over half believe that games are a positive part of their children's lives. Games and gamers are ubiquitous. People play alone and together, at home and on the move. All this time spent gaming has largely been at the expense of time previously spent consuming other kinds of media, in particular TV and movies. Nonetheless, people have often worried that gaming has caused serious problems for social interaction and physical activity and health. However, data from gamers themselves question whether such stereotypes apply to the majority of gamers.[4] The socially isolated, physically inactive, teenage gamer certainly exists, but she or he is an endangered species.

So people like video games. In fact people *love* video games. Video games offer us enjoyment, they motivate us to keep playing, and they may be tapping into something quite profound about human nature and what it means to live a fulfilling life. What might these things be?

A helpful place to start is to ask what we mean by a game, and what it is that makes something a game rather than an activity, a sport, or a chore. The game designer and writer Jane McGonigal[5] cites philosopher Bernard Suits, who states that

> To play a game is to engage in activity directed toward bringing about a specific state of affairs, using only means permitted by specific rules, where the means permitted by the rules are more limited in scope than they would be in the absence of the rules, and where the sole reason for accepting such limitation is to make possible such activity.[6]

Abbreviating this somewhat, McGonigal defines a game as 'the voluntary attempt to overcome unnecessary obstacles.' This definition is useful, as it

captures the essence of what we are doing when we play. The activity needs to be voluntary, because when we are forced or required to do something, it ceases to be a game and quickly becomes work. Second, the activity is goal oriented, as there is something we are trying to achieve (moving a story arc along, achieving a new high score, advancing our character, killing a dragon). Third, the game places *unnecessary* obstacles in our path. McGonigal observes that walking long distances to drop a ball into a small hole is tedious, trivial, and no fun at all. Introducing an unnecessary obstacle into the activity (trying to get the ball into the hole using only a long stick with a lump of metal at the end) turns the activity into a game, in this case the game of golf. All of a sudden we are playing, and it is fun.

While this definition of a game is attractive, it begs the question of why such activities should be so motivating and enjoyable. To solve this particular problem, what we need is a definition of enjoyment or fun. The economist Edward Castronova,[7,8] who has written extensively on the effects of massively multi-player online games (MMOs) such as *World of Warcraft*, defines fun as *the pleasant experiences associated with co-activation of motivational systems which promote survival, in the context of a person's choices and decisions, in an environment which they know to be a game*. This definition requires some unpacking. First, there is sound neurobiological evidence that we possess two basic motivational systems, one designed to generate behaviors associated with approaching desirable objects (food, friends, magical swords, etc., referred to as the *appetitive* system) and another associated with avoiding undesirable ones (steep cliffs, toxins, dragons, etc., referred to as the *aversive* system). The importance of co-activation is that according to Castronova both systems need to be activated at more or less the same time before anything can be fun. So receiving something appetitive like a kiss from a loved one is nice, and involves activation of the appetitive system, but it is not fun, in sense of play activity or "having fun." Similarly, wading through cold mud is unpleasant, and activation of the aversive system alone does not result in fun. However when the two are co-active, and we wade through cold mud in order to get a kiss from a loved one, all of a sudden we are having fun. Assuming we know this is a game, and the cold mud was not placed there by a sadistic spouse, but is an unnecessary obstacle between where we start and what our goal is, fun arises.

What is interesting and important about these two definitions, one about what makes a game, and the second about what makes playing games fun, is that they result from biological mechanisms that are common to many species in addition to our own. This observation may offer an explanation for another important feature of video games, the extensive use of violence. In order to arrive at this conclusion we need to examine the functions which play may serve in our own and other species.

There is lots of evidence that the young of many species play with each other, and spend a lot of time engaging in generally fairly rough and tumble

activities which seem to serve no obvious purpose. No obvious purpose, perhaps, until we start asking questions about what is being learned during all this play. A highly influential account of why organisms play has been put forward by the psychologist Barbara Fredrickson.[9] Fredrickson argues that when we play, we are actually experimenting with new ways of solving problems, in a safe environment which permits creative experimentation and does not penalise failure. Clearly, experimenting with new ways of escaping from a real predator is not a sensible thing to do, as the risks involved are very high and individuals adopting this strategy would likely end up eaten. In contrast, experimenting with different ways of running away, dodging, and hiding with your brothers and sisters might *broaden* the range of options you have, and *build* physical and psychological resources that could help you survive when the predator is a real one. Fredrickson's *Broaden and Build* theory suggests that play lies at the heart of learning, and those individuals who play stand a greater chance of survival than those who don't precisely because they have greater flexibility in the behavioral responses available to them.

Even seemingly pointless activities such as tickling may actually serve an important function. Psychiatrist Donald Black[10] observed that the places where we are most ticklish (the neck, the sides of the body, the exposed soles of the feet) are also those which we might need to protect in an emergency. Tickling motivates us to escape while simultaneously making us laugh (a signal normally interpreted as meaning 'carry on!') In other words it simulates an emergency situation in that we need to protect vital areas of our bodies from being 'attacked' by an opponent who is not going to give up. As such, tickling co-activates the appetitive and aversive motivational systems, as outlined earlier, and (though sometime we might not believe it) fits our definition of fun.

So play and fun are inextricably tied up with survival. Like soldiers on the firing range, young organisms engage in safe but violent facsimiles of real world fight or flight, life or death situations. So long as everyone knows it is a game, with punches stopping short and teeth nibbling rather than biting, everyone benefits from the activity.

Games can also be understood as meeting basic psychological needs. For example, Self-Determination Theory[11] suggests that video games can help us to meet basic psychological needs that are not always met through real-life activities, particular needs for socialization, competence, and autonomy. To illustrate this, one need only contrast the drudgery of many people's work lives, filing papers from an inbox into an outbox, with the fictional universe of a video game in which, along with friends, one can seem to have a real and meaningful impact on the game world through one's own actions. This can be powerfully motivating.

Defining and Measuring Violence and Aggression

> I believe that present day civilized man suffers from insufficient discharge of his aggressive drive.
>
> (Konrad Lorenz, *On Aggression*)[12]

The words of Konrad Lorenz, who won the Nobel prize for his work on animal behavior, remind us that aggression is a *drive*, a naturally occurring behavior which helps organisms get what they need. While aggressive behavior may not be appropriate in many situations which face modern humans (and aggressive behavior certainly is an important issue facing society), we should not fall into the trap of believing aggressive responses are *never* appropriate.[13] Aggression motivates us to acquire what we need, achieve our goals, and help defend what we have from others who aggress against us. An individual who lacked aggressive behaviors on which to draw in times of need would not pass its genes on to the next generation.

So there is a natural component to aggression, and aggressive behavior is not necessarily a negative thing although it may be if overused or used maladaptively. What are the effects of repeated experiences of aggression or repeated exposure to the aggression of others?

There are two main responses to this question. Theories which focus on the *desensitizing* effects of violence and exposure to violence state that repeated exposure to violence reduces its emotional impact, and makes violent acts 'normal.' If we live in an environment where, rightly or wrongly, we perceive violence to be normal, then there is nothing wrong with behaving violently ourselves. In this account, exposure to VVGs desensitizes people to violence, making them more likely to be violent in the future.

In contrast, theories which emphasise *catharsis* view aggression and violence in much the same way as Lorenz, as drives which need to be 'discharged.' The principle of catharsis (which originates in the work of the Greek philosopher Aristotle) is seen as a form of purging, or purifying innate emotions and tensions, leaving us in a state of balance. Under these ideas, VVG play represents a psychologically healthy activity, and indeed we might predict that it would lead to a *reduction* rather than an increase in real-life violence.

There is evidence to support both positions, although in general it is rather tenuous. The P3 component of brain activity (called P3 because it is a *positive* electrical change which occurs approximately 300 milliseconds after a stimulus has been presented) is generally regarded as the brain's response to an unexpected event. For people who have little experience of playing VVGs, P3 is reduced when they are exposed to violent images after playing a VVG, relative to a non-violent video game, suggesting they have become desensitized to violence.[14] However, it remains unclear whether they have become desensitized in the sense of being willing to commit violent acts themselves, as opposed to merely becoming bored with repetitive stimuli (we suspect the latter). Other studies

have demonstrated that aggressive or hostile tendencies may in fact be reduced after VVG play, providing some support for the catharsis model.[15]

Asking which approach is the 'right' one is a pointless exercise. Like many disagreements, both sides have their strengths and weaknesses, and both desensitization and catharsis play a role in aggression and violence. Rather than ask questions about *which* theory is correct, we should focus our efforts on identifying the circumstances under which *each* exerts its effects. Human behavior is complex, and is determined by many factors interacting together (a fact which should make us realise there is no one answer to questions like 'do violent video games cause violent behavior?'). Most scholars agree that aggression and violence are multi-determined, including influences from biology and genetics, stimuli in the immediate environment (for instance, provocations from others in the social environment), pre-existing tendencies (their personality, aggressive traits and so on), and life history (e.g. exposure to violence in the family or community). No single factor determines whether someone will aggress or not in a given situation. What remains unclear is whether violent video games is, or is not, one of those factors. A risk/resilience approach to understanding violence does not mean "all have won and must have prizes" and some issues people identify for potential concern may ultimately prove to have little value in predicting violence.

In addition to complex relationships between the various factors which might lead to aggression, aggression itself is a complex idea. Aggression can refer to behaviors, or to tendencies and attitudes, and different definitions of aggression lead to difference measurements which present their own advantages and disadvantages. An appreciation of the different kinds of measures which have been used is useful when trying to understand the results of research.

Different researchers choose different measures of aggression, and these relate with differing degrees of effectiveness to the sorts of real-life behavior we are interested in. Sometimes, the measure of aggression is not chosen by the researcher at all, but is simply already available. For instance, if we believed there to be a link between VVG playing and violence, we might conclude that as the availability of VVGs increases, the amount of violent crime also increases. All of these data are publicly available, but in formats over which we have no control (e.g. sales data on VVGs over the past ten years and national data on the incidence of various forms of violent crime over the same time period). Our hypothesis might lead us to predict a strong association between the two. As VVG availability increases, so does violent crime.

When we look at data such as these, the pattern actually appears to be the opposite of what we would expect if there were a link between VVG play and aggression. While sales of VVGs have increased dramatically over the past decade, the incidence of most forms of violent crime has steadily declined. As a society, we experience more virtual violence and less real-life violence than ever before. These observations hold even when we consider sales of violent games specifically.[16] As observed in Figure 4.1, the popularity of

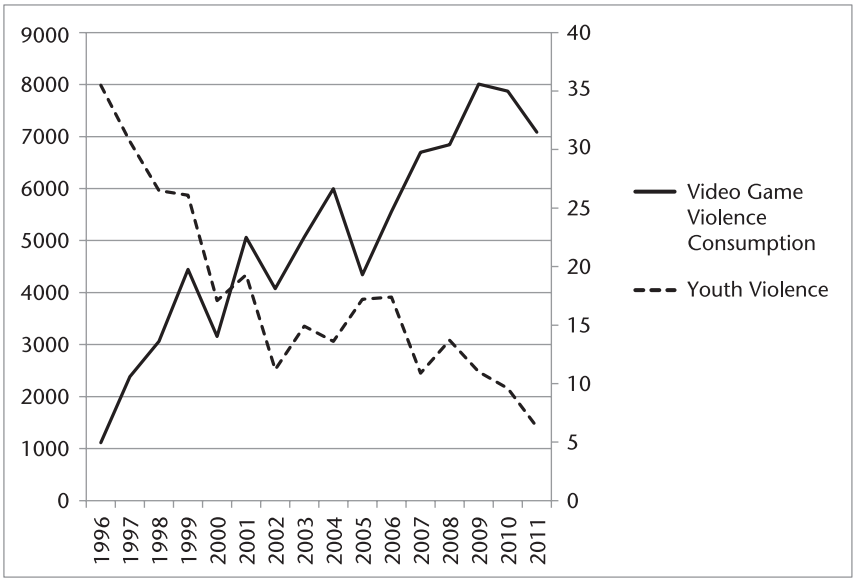

FIGURE 4.1 Societal Video Game Violence Consumption and Societal Youth Violence, 1996–2011

violent video games are inversely related to youth violence rates in the United States (similar results apply to most industrialized nations).

So does this prove that VVGs cause a reduction in real-life violence? No, it doesn't. These data are *correlational*, just two sets of observations, one about the incidence of violent crime, the other about sales of VVGs which when juxtaposed appear to suggest there is no link between the two. We note that these data do not rule out the possibility that video game violence may have some small influence on some types of aggression, particular minor forms of aggression not represented in crime statistics. However, these data do caution us about the types of extreme statements linking video game violence to real-life violence which have become common in the field, such as linking video games to mass shootings, claiming that the effects of violent video games on aggression were as strong as smoking on lung cancer, or that as many as 50 percent of homicides could be attributed to video game or other media violence.[17–19] Data to support such claims simply aren't materializing.

What can we do about this? There are several key issues which include how we draw inferences from data, the kinds of measurements being used, and the nature of the data we are examining as well as the sorts of methods being used to gather those data. We will consider these in the discussion which follows as they are key to understanding how complex these issues are, and how much confidence we should have in the outcomes of research.

When we examine existing data such as VVG sales figures and the incidence of violent crime, we need to recognize that any relationship can be explained in a number of different ways, and the data cannot tell us which if any of these is correct (or even if there is a correct one). The fact that increases in VVG sales are associated with decreases in reported violent crime is just an association – intriguing for sure, but in no sense proof that one factor causes the other. Indeed, with the increasing availability of large datasets, all sorts of intriguing and sometimes amusing associations between data can be found (the interested reader is directed to Tyler Vigen's *Spurious Correlations* website at tylervigen.com). An association between any two factors can be explained in a variety of ways, and the fact that there is an association often offers no clues as to which is the correct explanation. Possible explanations include:

1. The first variable causes the second (in our dataset, playing VVGs makes people less violent).
2. The second variable causes the first (the reduction in real-life violence has made people want to play VVGs).
3. There is an additional factor or factors which explains the association (for instance, people spend more time playing VVGs, and less time going out and being the perpetrators or victims of violent crime).
4. The relationship (or lack of one) is spurious and coincidental (for instance, there is a strong relationship between the number of Somalian pirates and the global temperature, but no one would argue that there is a *causal* relationship at work here).

Thus, advocates for differing views must be cautious in overinterpreting such data. While the data on video game violence and youth violence caution us to be conservative in our statements regarding the impact of video game violence, it would be mistaken to conclude from such data that video game violence is *causing* the reduction in youth violence. This would be an example of an ecological fallacy.

The data discussed above form one end of a continuum of evidence which has been brought to bear on the question of VVGs and violence. Sales and crime data are very large-scale data, but are uncontrolled. They have the advantage of *size* (there are lots of sales and lots of crimes) but the disadvantage of *inference* (we cannot draw any conclusions from them). Other methods sacrifice some of the advantages of size in order to increase the power of inference. For instance, *cross-sectional* studies look at different pre-existing groups (for instance, those who play VVGs and those who don't) and compare them on a variety of measures such as aggression and violent behavior. Such studies tend to be relatively cheap, but their interpretation is often open to question. *Longitudinal* studies measure various factors, including VVG play, over a period of time, perhaps extending over several years, examining how people change as

a result of the games they play. Such studies are relatively costly to perform, but yield interesting data although still basically correlational in nature. Finally, *experimental* studies manipulate the experience which participants have, for instance getting people to spend time in a laboratory playing a VVG and then measuring their levels of aggression or violence. Such studies have the advantage of being able to establish causal links (if done properly!), but are costly and time-consuming, and fraught with technical issues, many of which relate to how the experimental manipulation is delivered, and how the resulting behavior is measured.

Cutting across all these methods of investigation is the issue of how to measure and define aggression and violence. A number of different approaches have been taken which can be conveniently categorised into *direct* and *indirect* measures.

Direct measures usually involve an observable act or behavior which is clearly aggressive in nature. Verbal or physical abuse are clear examples, as are the violent crimes from the example considered earlier. While such acts are fairly unambiguous, modern codes of conduct and ethical principles prevent researchers from generating such strong responses in their participants, and less dramatic measures have been developed. Among the most widely used of these is the 'hot sauce' method[20] which involves a participant deciding how much hot sauce another person will be required to consume (the other person rarely has to consume the hot sauce, but the participant believes they will have to). The amount or spiciness of the sauce are taken as direct indicators of how aggressive one person feels about another. A typical experiment might require participants to play either a VVG or a non-violent game, perhaps against another player (who may or may not be visible), and then asked to make up hot sauce which they are informed the other player will have to consume. Hotter or larger portions of sauce are taken as direct indicators of aggression toward the other player. However, it is not clear how much such behavior tells about aggressive behavior in real life. Is this the sort of minor boost in aggression we might expect from a whole host of situations that involved competition such as playing a board game, watching a sporting event, having a debate, etc.[21] or is such behavior more meaningful? Youth gangs don't chase after each other with vials of Wasabi or Tabasco sauce, after all.

In contrast to direct measures, *indirect* measures eschew observable behavior and instead measure attitudes or beliefs using *self-report* measures. So a participant might play a VVG and then be asked a series of questions about how they feel, or how they are likely to act in a variety of given situations. While such measures are cheap and easy to administer, they suffer from two main weaknesses. The first is that aggressive attitudes do not translate all that well in aggressive behavior, and the second is that the development of reliable questionnaire measures is a science in itself, and requires a great deal of testing and development. Self-report is sometimes the only method which can be used, but

we should be wary of drawing strong conclusions from its results. Further, pairing questions about violent video game play with questions about the respondent's own violent or aggressive behavior can create *demand characteristics* in which respondents may feel pressured (consciously or unconsciously) in a particular manner, creating spurious correlations.

So, exactly what is meant by aggression or violence, particularly in the way such constructs are measured in research, remains controversial. Even the concept of *violent video game* is one without clear boundaries. For instance, in a recent murder trial in which a scholar implied a mass homicide might be blamed in part on video games, that scholar had to acknowledge under cross examination that even games such as Pac-Man might be considered violent video games in the broad way they are often classified by scholars.[22] Most people would find this to be absurd, of course, but this points to continued issues of poor clarity in the research field regarding the constructs of interest. Indeed the entire concept of "violent video game" may need rethinking. Although such a construct has considerable moral salience, it encapsulates such a broad range of video games under a single heading as to arguably have little conceptual value.

Contradictory Findings and Contradictory Messages

From the discussion above it may now be clear why there are so many conflicting findings and recommendations. It is fairly easy to find what appears to be authoritative guidance which states that VVGs are bad, or good, or neither one nor the other. Dozens of studies have found links between VVG play and aggression, but dozens more have found no links. Even formal methods designed to produce simple answers to questions like this by mathematically combining the results of many studies fail (i.e. meta-analysis) to arrive at the same answer, and lead to yet more technical disagreements.[23–25] How can the non-specialist possibly navigate their way through this morass? In this section we draw upon what has already been discussed, condensing it into a 'research evaluation toolkit' which offers the concerned person a set of questions they can ask about any new piece of evidence which should help them understand its significance and impact.

A Research Evaluation Toolkit

1. Remember that individual studies do not tell us a great deal. A single finding is merely that – a single finding. It is very rare that single findings completely change our understanding of a phenomenon. Always interpret 'groundbreaking' new research not as groundbreaking, but as adding another brick to a slowly enlarging structure whose final form may still be unclear. Be wary of press releases that imply a new study definitively

answers a controversial question . . . such claims often inform us more about researchers' biases that may have influenced their study than they do "truth."

2. Has the research been published, or is about to be published, in a reputable peer-reviewed journal (the hallmark or 'gold standard' of academic research)? You can find journals on the internet very easily. If the research has not or is not about to be published in a peer-reviewed journal then it has not been subjected to the scrutiny of experts. While it may indeed be important research, until such time as it has been properly reviewed, it can probably be safely ignored.
3. How clear is the link between VVG activity and aggression and violence? Referring to our discussion of direct and indirect measures, are the purported links of any importance?
4. How well have aggression and violence been measured? Good research uses standardized measures which may have taken years to develop and whose utility is well known. Questions which appear to have been made up by the researchers themselves should be treated with caution.
5. Are the outcomes of clinical or criminal significance? Academic research often focuses on relatively small statistical effects which may be important to theoretical ideas but which may have little if any practical implication. While it may be that playing a particular game makes people more likely to express aggressive thoughts, that does not mean they are bound to act more aggressively. If playing a VVG makes people likely to act aggressively, that does not mean they are bound to be violent. And even acting violently may not be violence directed at another person, or occur in a criminal context. What was the magnitude of the effects? If a study finds evidence for effects, but they change behavior by only 1–2 percent . . . or less . . . are these effects of any practical value in the real world? Would you notice if you were 2 percent more aggressive, or happy, or sad, today as compared to yesterday?
6. Did the author consider any other possible explanations for their results? As we will see later, VVGs are not purely about violence. They may include competition and frustration, both of which may contribute to aggressive thoughts or behaviors.
7. Were there any pre-existing facts about the participants in the research which might have influenced the outcomes? Were the participants representative of the population, or unusual in some way (e.g. college students, the most popular source of data for research)? Was the study design set up in a way to make it obvious to participants what the researchers' hypothesis was (which can cause spurious results)?
8. Does the study engage in "citation bias?" Citation bias is when study authors don't cite any studies that conflict with their personal beliefs. Typically authors do this to make it sound like the evidence against video games is more conclusive than it actually is. Such behavior is considered

unscientific practice.[26] It also alerts the reader to significant researcher biases which can have an influence on the results of their study.

A final point to bear in mind when evaluating evidence concerns one's own personal beliefs. For reasons which we develop in section 5, many people have a pre-conceived notion that new media are dangerous. We don't doubt that there are potential dangers in any new media (and indeed in any new technology), but we think it is sensible to adopt a neutral stance on new technologies, neither loving nor hating them. Assume new media can be used for both good and bad, and evaluate the evidence which arises from careful investigation of these effects.

Video Game Violence and Real World Violence

Sometimes, the focus on the effects of VVGs on people seems to ignore the very thing social science research is concerned about – people. People respond very differently to different media, and these individual differences might mediate any relationship between exposure to VVGs and violent behaviors. Our personalities constitute an excellent and informative example of where individual differences may be at least if not more important as the kinds of games we play in determining what happens to us.

Psychologists believe that personality is best described in terms of five underlying factors, or dimensions, all of which are possessed by everyone to a lesser or greater degree. In effect, everyone's personality can be described in terms of where they lie along five measurements, where each measurement is completely independent from all the others.

The five dimensions can be summarised by the acronym OCEAN, which stands for Openness to experience, Conscientiousness, Extraversion, Agreeableness, and Neuroticism. Like most measures, people tend to cluster around the average (for instance being neither extraverted nor its opposite, introverted), with decreasing proportions of people scoring toward the extremes (this is the well-known 'bell shaped curve' which describes the distribution of scores in a very large variety of measures). While our personalities may change a little over time, they are pretty fixed, and there is some evidence that they are partially determined by genetics.[27]

As outlined above, the five personality dimensions are independent. So, knowing whether someone is agreeable or not (that is, they place a high importance on getting along with other people) tells you nothing about how conscientious they are (that is, the degree to which they do or do not value order and attention to detail). Each of us is a mix of the five dimensions, so our personality might be average on openness, high on conscientiousness, low on extraversion, average on agreeableness, and high on neuroticism. This is how a simple five factor model, which on the surface might appear

rather simplistic, is actually capable of describing a very large number of different personalities.*

So is there a personality 'type' or profile which might make people especially vulnerable to VVGs? While there is not a great deal of evidence which either supports or challenges this idea, there is every reason to suspect that people will respond differently to VVGs (indeed, it would be astounding if they didn't) and that personality might hold the key to discovering what these relationships might be. The key lies in looking not just at a single dimension, but how particular patterns of scores on different dimensions might relate to psychological vulnerability.

Just such a question was asked by researchers Patrick and Charlotte Markey and published in 2010.[28] They argued that no one personality dimension makes a person vulnerable, but that certain levels in three of the Big 5 dimensions, when present in the same individual, might be critical. Their conclusion is that people who score low on conscientiousness, low on agreeableness, and high on neuroticism may possess a pre-existing disposition to be negatively affected by VVGs. Such people tend to be fairly unconcerned about the feelings of others, are likely to break rules and not worry about convention, and experience strong emotional reactions to events. When exposed to violence or frustration, people who have this 'vulnerable' personality may respond strongly, and without concern for social rules or the feelings of others.

While fascinating, these ideas are far from conclusive, and have only been subject to a small amount of experimental investigation. It is important to note that Markey and Markey say only that predisposed individuals become a bit more hostile after playing VVGs, not that they engage in violent acts, or commit mass shootings. Other evidence has found a lack of relationship between VVG playing and pre-existing mental health symptoms in children,[29] so it's important not to generalize these results too far. However, the emphasis on an interaction between VVGs and individual differences is important, and this general notion has received a great deal of attention from researchers interested in asking the broader question about whether we can predict the type of person who will commit acts of violence. The developing field of *behavioral genetics*, for instance, looks at both the genetics and the environment of a person, and seeks to identify how the two interact in order to affect behavior. For instance, a gene referred to, somewhat unintelligently, as the 'warrior' gene, affects the levels of an enzyme, monoamine oxidase A (MAOA) which is responsible for breaking down some of the chemicals affecting transmission of information in the brain. About a third of the population has a version of the MAOA gene which means they produce lower levels of the enzyme. Such people are indistinguishable

* If you are interested in measuring your own personality, a good place to head is https://personality-testing.info/tests/BIG5.php which is a 50-item assessment of the Big 5 personality traits.

from those who produce normal levels of the enzyme except when certain environmental conditions hold. In one piece of research, which examined the effects of MAOA levels and childhood maltreatment on violent criminal behavior, neither MAOA level nor a history of childhood maltreatment had an effect in isolation, but in combination the two accounted for a significant proportion of violent crime, i.e. those who had the 'low' form of the MAOA gene *and* were mistreated as children.[30] In a second paper,[31] those with low levels of MAOA tended to respond more aggressively when severely provoked (notably there was no effect for mild forms of provocation), in that they administered more hot sauce to their opponent than participants with normal levels of MAOA.

What this all means is that there is fairly clear and increasing evidence that VVGs do not 'cause' aggression, but may interact with biological and psychological characteristics of individual people, making some more vulnerable individuals more like to respond aggressively than before. However, how we interact with media is often complex and individualized. Playing VVGs may make one person a little angrier . . . but playing a non-violent game might make a different person a little angrier. We've all seen people who respond to losing a game of checkers or cards by throwing the game pieces across the room. It's difficult to definitively predict how media will influence any one person. Does this still mean we ought to be worried about violence in games? One more factor casts doubt on this conclusion.

When we play a VVG, it is typically the violence which we first notice. Many games are built around continuous violence on a scale no living person would ever realistically expect to encounter. As such, the salience of all this violence grabs our attention and focuses it. It is hardly surprising that when asked to identify what it is about VVGs which is 'the problem,' we tend to focus on the violence.

But games, even extremely violent ones, contain much more than just violence. They require planning, and timing, and coordination. They typically involve some degree of competition, whether it is against other (human) players, or computer controlled enemies, obstacles, or challenges. So there is an element of winning and losing involved. All of these activities make demands on our *cognitive* faculties, those parts of the brain responsible for thinking, problem solving, planning, and decision making. As anyone who has seen a carefully developed strategy or plan fail (whether in the virtual world of a video game or in the real world) will know, such frustrations can generate significant levels of aggression. Games, even the most violent ones, involve a great deal more than just violence.

A serious challenge of research which aims to investigate the relationship between VVGs and violent behavior is that when a person plays a VVG, they are also planning, and competing, and problem solving, and coordinating their movements. Just because the violence is salient does not mean that any

behavioral or psychological effects of play are being caused by the violence in the game. We might imagine two games, one of which is principally based around violence, the other not, with both involving the same amount of competition and/or frustration. Any differences between how people behave or think before and after playing this pair of games has probably been caused by the violent content, as this is effectively the only difference between them. If on the other hand we take two VVGs with the same violent content, but one is frustrating while the other is not, and we still observe differences between people before and after playing the games, then clearly the violent content is not having an effect.

When researchers examine what happens when the violent content of a VVG is extracted or matched in some way, interesting findings emerge. For instance, a violent game can be 'modded' to remove a lot of the violent content while leaving the game otherwise unchanged. A team of researchers headed by Malte Elson[32] changed the normal blood and gore content of a game, replacing the gun used by the player with something that looked and sounded like a tennis racquet, and freezing enemies in place rather than have them die graphically and noisily. All the other game mechanics remained the same, but the change in violence levels had no effect on players' levels of aggression.

In a separate series of studies, Paul Adachi and Teena Willoughby examined two situations where aspects of games were matched.[21] In the first, participants played games matched in competitiveness, where one was violent and the other non-violent. Using the (by now familiar) hot sauce paradigm, they found that levels of aggression were not elevated in those who played the violent competitive game compared with those who played the non-violent competitive game. In the second study, the authors used four different games matched in terms of both competitiveness and violence, so participants played either a non-violent non-competitive game, a non-violent competitive game, a violent non-competitive game, or a violent competitive game. Consistent with the idea that it is competition, not violence, which leads to aggression, participants who played competitive games used more hot sauce than those who played non-competitive games, but those who played violent games used no more hot sauce than those who played non-violent games. Andrew Przybylski and colleagues[33] found similar results when controlling carefully for levels of frustration in video games. Frustration, but not violent content, was causally associated with aggressive behavior.

Increasingly we are seeing that it is difficult to conclusively link VVG exposure to aggressive behavior or certainly violent behavior in society. Research studies have produced conflicting results and even those that do find results produce very small effects. A good question is, if the research has been inconsistent and tended to produce such weak results, why do some scholars persist in proclaiming VVGs as an imminent public health threat? It is to this issue that we next turn.

The Sociology of Media Violence Research

Perhaps part of the challenge for the general public as they watch the sometimes acrimonious debates on media violence is the assumption that science always works objectively toward a desire to seek "truth." This is, of course, the ideal of science, but we often forget that science is a human endeavour, part of human society, and in many ways influenced by that society. Scientists need to secure grant funding and tend to enjoy news coverage of their studies, professional and societal prestige, and even political influence. Generally, these goals are more easily met by proclaiming something to be a problem that can be fixed by scientists, rather than deciding no problem exists at all. This does not mean that scientists are not acting in good faith, only that they are human and are not immune to societal pressures.

To understand those societal pressures we can turn to a sociological theory known as Moral Panic Theory.[34] Put briefly, Moral Panic Theory (see Chapter 2) states that people try to explain distressing social circumstance (real or imagined) by seeking "folk devils" to blame them on. Blaming mass shootings on VVGs is a perfect example. Mass shootings make us anxious, and we seek out answers for why they happen that give us an illusion of control. If only we get rid of the VVGs, we might prevent mass shootings! This is, of course, false, but it gives people a sense of control over something uncontrollable. Historically all manner of media, from dine novels, to waltzes, jazz, rock and rap, to comic books, to *Dungeons and Dragons*, Harry Potter and now VVGs have been the subject of moral panics. Very often scholars participate and fuel these moral panics. Most famously, Frederic Wertham, a prominent psychiatrist, testified before congress in the 1950s that comic books caused not only juvenile delinquency but homosexuality (because, it was said, characters such as Batman and Robin were secretly gay). In retrospect, Wertham is typically perceived as an overzealous advocate who may have falsified his data.[35] Scholars have participated in other moral panics, such as that over *Dungeons and Dragons*, as well as the congressional hearings in the 1980s over rock and pop music (which targeted bands ranging from AC/DC to Twisted Sister to Cyndi Lauper!).

It would undoubtedly help us to understand how the scientific community responds to moral panics, and how moral panics and political pressure can do damage to the objectivity of scientific research. Whatever one may think about VVGs having some minor influence on aggression, it is now clear that some of the extreme statements of scholars[17–19] were misguided and accomplished little other than to damage the reputation of social science as an objective enterprise.[36,37]

Understanding why this occurred can be helpful in preventing further cycles of moral panic among scholars in the future. For instance, although it was not uncommon to hear proponents of the causal position claim near universal agreement among scholars on the issue of media or VVG effects, recent data

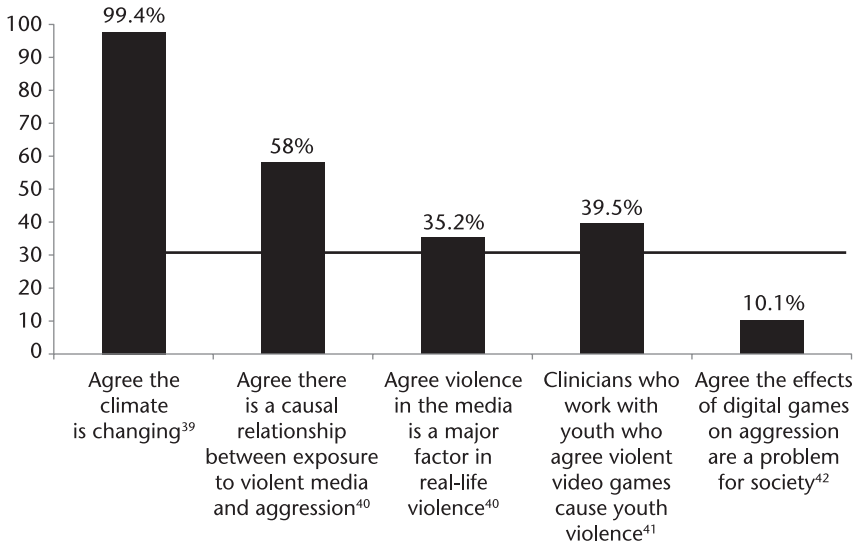

FIGURE 4.2 Lack of Consensus among Scholars on Violent Media Effects

have put paid to such claims (see Figure 4.2). Rather than a clear consensus, across studies, it appears that a minority of about 30–40 percent of scholars agree that violent media is a societal problem. This is not to say that such a substantial minority should be ignored, rather it is time to dispense with the myth of a universal consensus among scholars and return the academic culture to one in which open dialogue and discussion, rather than quasi-religious insistence on particular "truths," has become the norm. Indeed, some causationist scholars have taken to smearing their opponents as "industry apologists" despite the absence of industry funding in aggression research,[38] and this aggressive culture among scholars themselves is unlikely to be productive for scientific objectivity. Only by opening the field to scholars of all opinions can the reputation of the field as an objective science be salvaged.

Given that scholars have varied opinions about what influences VVGs might have (for both good and bad) it would be valuable to examine scholars themselves. For instance, work with the general public[43] demonstrates that fears of video games tend to resonate along generational lines. That is, older adults who don't play video games tend to fear them more than younger adults who do. It may very well be that a similar pattern holds for scholars. Or perhaps certainly fears of youth (i.e. juvenoia) or personality traits also predict certain types of opinions about video games, which may, in turn influence research findings through researcher expectancy effects.

It may also be helpful to examine how well-known sociological processes such as group-think, confirmation bias, and cognitive dissonance (i.e. scholars

producing research to support their own parenting practices) may influence research fields. Furthermore, how do *warning bias* (the bias to warn the general public about potential problems even if the evidence isn't clear) and *sanctimony bias* (the bias involving warning of dangers created by other people, such as the video game industry, which by contrast make oneself appear morally superior) influence scientific research fields, particularly on morally valenced issues such as violence? Understanding this sociology of media effects research may help us to be more cautious as we inevitably approach questions of yet newer media in coming decades. It would be beneficial to learn from history rather than to simply repeat it.

Concluding Statements

People generally want to know a simple answer as to whether VVGs cause aggression or societal violence. As we can see here, the likelihood that VVGs cause societal violence is minimal. Even in the heyday of panic over VVGs in the mid-2000s, the American Medical Association came to this conclusion[44] despite worrying over more minor short-term aggression. However, as we've seen, even the research on short-term, minor aggressive behaviors is unclear. It may be that other features such as frustration or competition are more important than violent content when it comes to aggressive behavior.

Understanding the influences of VVGs or other media can only be done with a fuller understanding of societal moral panics over media and how these moral panics influence the scientific process. Without such an understanding, we are unlikely to exit a repetitive cycle of exaggerated fears followed by public ridicule (e.g. Frederic Wertham). And before we are able, as a scientific field, to produce reliable answers, we must change the scientific culture from one in which adherence to particular "truths" is rejected in favour of a culture of open inquiry in which scholars of all conclusions are welcomed.

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