The Psychology of Gaming: How Playing Video Games Affects Our Minds

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On my honor as a University student, I have neither given nor received unauthorized aid on this assignment as defined by the Honor Guidelines for Thesis-Related Assignments

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Introduction

The video game industry has grown since its start in the 1960s and '70s to become one of the new top consumer markets. In 2019, the global video game market was $148.8 billion, surpassing the movie production industry by over $10 billion (Georgiev, 2019). Around the world, there are 2.5 billion gamers, which is almost one third of the entire human population, with the average gamer being around 34 years old (Georgiev, 2019). Gamers are also fairly diverse too; almost half of all gamers in the United States are women and 23% of gamers are over 50 (Georgiev 2019). With so many games falling into different genres, such as role-playing, strategy, puzzle, sports, and simulations, there is often a game for anyone's taste.

However, video games have historically been blamed for causing violence among the kids who play them. In the wake of the Columbine shootings of 1999, people often blamed the first-person shooters *Doom* and *Quake* for causing Eric Harris and Dylan Klebold to kill 13 people (Kocurek, 2019). Jack Thompson, a Florida attorney and critic of the video game industry (Beneditti, 2007), blamed *Counter Strike*, also a first-person shooter, causing the Virginia Tech shootings in 2007. Even now, after the recent El Paso and Dayton shootings, politicians blame video games for causing such tragedies, stating that it such "gruesome and grisly video games" (Trump 2019) dehumanize people and "[glorify] violence in our society" (Trump, 2019).

Such accusations don't have much scientific support backing them. The YouTube channel *Game Theory* released a video summarizing the current evidence on violent games causing violence. Through examining video game and crime statistics, mass shooter profiles, psychological studies, and even a Supreme Court ruling, it concluded that there was no

scientific proof that playing violent video games causes people to be violent (Game Theory, 2019).

After watching this video, I was inspired to research how else playing video games affects our minds. Do we gain other skills by solving puzzles, reacting quickly to stimuli, or strategizing to beat opponents? What other ways to video games affect our brains, whether positively or negatively? In this paper, I will address the potential positive and negative consequences of playing games using published psychological research papers as well as speculate how playing different games helps develop different skills in players. I will argue that although playing video games can have potentially negative consequences, such as increased aggression or gambling behaviors, it can also lead to players developing or improving skills and other mental facilities that can benefit them in the real world.

Part 1: Video Game Controversies and Potential Harms

Even though most people associate it with causing violence, as the media tends to report on it after incidences of gun violence, video games have other issues that could be hurting those that play them. Video game companies, especially the large "triple-A" companies like EA and Activision, are notorious for predatory actions as loot boxes and psychological manipulation through game mechanics to cause players to be more and more addicted.

<u>Video Games and Violence</u>

People have been blaming video games for causing violence since the release of the original Mortal Kombat in 1993 (Newman, 2017), leading to the establishment of the

Entertainment Software Review Board in 1994 (“Video Game Controversies”, n.d.). News sources often forward these accusations after mass shootings.

Video Game Violence Linked to Bad Behavior, Study Says (CBS News, aired March 25, 2014)

Study Confirms Link Between Violence Video Games and Physical Aggression (Snider, 2018)

Fox News, on two separate occasions, aired broadcasts that blamed video games for causing the El Paso shooting, despite the shooter publishing an online manifesto about his racist and white-supremacist inspiration. In response to the anchor asking about how he feels about how video games affected the shooter, House Minority Leader Kevin McCarthy laments about how video games “dehumanize individuals” and that he “felt that it is a problem for future generations”, that “you can see the actions within video games” when looking at the scene of the shooting (Lloyd, 2019). In the other instance, the anchor asks a leading question to the guest about how these shooters are “raised on a diet of violent video games”, hoping the guest would blame these shootings on such games (Lloyd, 2019).

Such widespread blaming of video games is nothing new. It’s been a historical trend to blame the new media that the previous generation doesn’t understand. In the 1950s, the US Senate held hearings about whether comic books were making kids violent (Karlinsky and Przygoda, 2012). Suggestive rock lyrics caused enough problems in the 1980s that Tipper Gore, former Vice President Al Gore’s wife, led a crusade against them (Karlinsky and Przygoda, 2012). However, video games are now becoming much more immersive and realistic that comic books or rock lyrics ever could be. Further, players are actively controlling the actions and violence of the characters rather than watching or reading it.

The most convincing evidence for the idea that playing video games causes violence is a classic psychological experiment done by Albert Bandura in the 1960s. In the experiment, children between the ages of 3 and 6 years old watched a person being either aggressive or non-aggressive toward a Bobo doll (McLeod, 2014), which is a toy doll that will bounce back upright if pushed or hit in a direction. After an aggressive arousal stage, where the experimenter didn't allow the child to play with some attractive toys, the children were then provided with non-aggressive and aggressive toys. Non-aggressive toys included a tea set, crayons, and plastic animal toys. Aggressive toys included a mallet, dart guns, and a Bobo doll. The researchers observed that the children who watched the person being aggressive were much more likely to imitate the aggressive behaviors (McLeod, 2014). With video games being even more interactive that simply watching someone, it's likely that simply playing video games would cause children to become more aggressive and violent. The American Psychological Association (APA) issued a resolution in 2015 states that many studies have linked video game exposure an aggressive behavior. They have even linked violent video game consumption with decreases in prosocial behavior, empathy, and moral engagement (American Psychological Association, 2015).

However, the APA makes a distinction between aggression and violence. In psychological terms, aggression is defined as an intent to harm another while violence is defined as the intentional use of force or power that either causes or likely causes harm (American Psychological Association, 2015). Thus, the APA states that while there is plenty of research that playing violent video games makes people more likely to exhibit aggressive behaviors, there is insufficient research that it also causes lethal violence (2015). Further, a US

Supreme Court decision in *Brown v. The Entertainment Merchants Association written* by Justice Antonin Scalia and co-signed by Justices Ruth Bayner Ginsburg and Sonya Sotomayor states that

"Psychological studies purporting to show a connection between exposure to violent video games and harmful effects on children do not prove that such exposure causes minors to act aggressively. Any demonstrated effects are both small and indistinguishable from effects produced by other media." (Supreme Court of the US, 2011)

Unfortunately, many news sources don't report on these nuances and directly jump to "Video games cause violence" and spreading misinformation.

Microtransations, Loot Boxes, and Gambling

With the emergence of smartphones and mobile gaming came a predatory strategy from game developers known as microtransactions. Popular game such as Candy Crush and Clash of Clans are initially free to play and download, but restrict player actions through energy and resource scarcity. To push players to continue to engage with their game, game companies introduce the ability to purchase energy and resource packs using a premium currency that can be obtained in-game, but only in small quantities. To obtain more of this premium currency, players need to spend real-world money to buy packs. Such purchases, known as microtransactions, have since expanded to include textures and skins, power-ups, or other virtual items. (King & Delfabbro, 2018).

Video game companies took this predatory practice even further with the development of loot boxes. A loot box is a mechanic that, like other microtransactions, allow the player to

spend premium currency for a randomly chosen in-game item, which could be anything from a cosmetic skin to even level skips in some games (Webb, 2019).

Many people, from players to lawmakers, have compared such randomness to gambling and exploiting the psychological mechanisms that are associated with gambling (Hern, 2019). Since game companies didn't reveal the probabilities of receiving certain items from loot boxes, players would often be sucked into purchasing them until they become committed to such spending (King & Delfabbro, 2018). Often, players fall into the sunk cost fallacy, where they see their spending as an investment and will continue to spend in an attempt to keep up with other players (King & Delfabbro, 2018). Such claims are backed by scientific studies as well. A replication study supported results showing that players with problem gambling issues are more likely to spend more on loot boxes than those without such issues (Zendle & Cairn, 2019). While the study doesn't establish a causal direction, whether loot boxes cause problem gambling or if it simply exploits existing psychological problems, it nonetheless provides evidence that loot boxes are problematic and require regulations (Zendle & Cairn, 2019).

Game companies have profited much from such exploits. Activision made more than half of its annual income from microtransactions in 2017 (King & Delfabbro, 2018) while the popular game "Fortnite" generated $2 billion in 2018 from microtransactions, despite being a free-to-play game (Webb, 2019).

Such uproar about loot boxes and microtransactions have led to regulatory changes. The Chinese government passed legislation in 2016 forcing game companies to reveal the probabilities for receiving items in loot boxes while Belgium declared that loot boxes violate

pre-existing gambling legislation and, thus, banned them in 2018 (King & Delfabbro, 2018). The United States has followed suit, with a bipartisan bill being introduced to ban loot boxes from games that are aimed at players under the age of 18 (Palmeri & Brody, 2019).

Gaming Addiction/Gaming Disorder

For many parents, their worst nightmare is that their kids will play games 24/7 and disregard their chores and schoolwork, wasting away in their rooms staring at their monitors. In some cases, such nightmares become reality, or worse. In 2005, a gamer killed his friend when the friend sold a virtual sword belonging to the gamer on eBay (Vitelli, 2013). In 2011, a 3-year-old child died of malnutrition due to her mother playing World of Warcraft for days on end (Vitelli, 2013). These cases are even more common in Asian countries like Taiwan, where people sometimes spend multiple days in internet cafes. A 32-year-old man died from cardiac arrest after playing games in an internet café for 3-days straight, with his corpse going unnoticed for hours (Hunt & Ng, 2015).

Although cases like those above do occur, gaming addiction is a controversial topic in psychology. The World Health Organization (WHO) recognized Gaming Disorder in their International Classification of Disease 11th Edition (ICD-11), defining it as

> "a pattern of persistent or recurrent gaming behaviour ('digital gaming' or 'video-gaming'), which may be online (i.e., over the internet) or offline, manifested by: impaired control over gaming; increasing priority given to gaming to the extent that gaming takes precedence over other life interests and daily activities; and continuation or escalation of gaming despite the occurrence of negative consequences. The behaviour pattern is of sufficient severity to result in significant impairment in personal, family, social, educational, occupational or other important areas of functioning"
>
> (World Health Organization, 2019)

While it did not recognize gaming addiction in 2013 when it published the DSM-5, currently most widely used manual of disorders in psychology, was published (Ratini, 2019), the American Psychiatric Association (APA) recently finally included Internet Gaming Disorder (IGD) as a possible diagnosis (Gentile et. al, 2017). However, it notes that much more research needs to be done to ascertain the causes, treatments, and nuances of diagnosing this problem. Further, high comorbidity with depression, anxiety, and ADHD require more study to determine whether IGD is an independent disorder or simply a symptom of another condition (Gentile et. al, 2017).

Nonetheless, many gamers have fallen prey to hyper-realistic worlds and predatory game mechanics designed to draw them in and keep them engaged. People in treatment for IGD have reported large debts from microtransactions (King & Delfabbro, 2018), not to mention the human connections and experiences they miss by spending so much time playing games.

Part 2: Possible Benefits of Playing Video Games

Despite the negative reputation video games might have due to media portrayal, many people still play games as it can be a great social activity for families and friends. Further, playing games can often provide a temporary escape from the dull monotony of daily work or school. Modern games provide fantastical worlds and engaging stories for players to experience. Since gaming has become the new popular pastime, they must also provide gamers with many benefits.

Building and Improving Skills

For most people, video games are often the opposite of learning. Video games detract from the source of learning, which is school or work. Many people think of video games as mindless, useless time-wasters. However, many studies have shown that playing video games has a positive impact on our minds, helping us develop skills that might not be trained at school or work.

Adventure and platform games are a great place to develop many real-world skills. Players must be able to look at a map to determine where their character is and how to best traverse the world to reach their goals. Further, they must have the skills and precision to overcome the obstacles that come in their way. A study in Germany, which had participants play the three-dimensional platform game *Super Mario 64*, showed that playing the game for two months at least 30 minutes per day resulted in increased gray matter in multiple brain areas associated with spatial navigation, strategic planning, working memory, and motor performance (Kühn et. al, 2013). Further, these changes were more pronounced the more the participants wanted to play the games (Kühn et. al, 2013). These results make sense as these skills are essential to pass the levels in that game.

While action games are often criticized for causing increased aggression and being mindlessly bloody and violent, they can be surprisingly beneficial since they force players to quickly process multiple incoming stimuli and react accordingly. A study utilizing some unnamed action video game has been able to improve the reading abilities of dyslexic children after just 12 hours (Franceshini et. al, 2013). Further, they showed that after 9 days of 80-

minute play sessions, these children had become better at reading than those who had taken the traditional reading treatments (Franceshini et. al, 2013). The researchers attribute this dramatic improvement to action games improving the children's attention skills, which translates into better reading abilities (Franceshini et. al, 2013). These results are supported in a later study, which showed that playing action games led to better improvement in perceptual tasks (Bejjanki et. al, 2014). In the experiment, all participants performed equally on the perceptual tasks, but those that went through a 50-hour action-game training session improved much faster on the task than those that didn't play video games (Bejjanki et. al, 2014).

Strategy games, on the flip side, have player slow down to plan out how to approach situations. These games have been shown to train problem solving and creativity skills in children, yielding both immediate creativity boosts (Moffat et. al, 2017) and later benefits through higher school grades the following year (Jackson et. al, 2011). These findings also applied to other games as well, including violent shooters (Jackson et. al, 2011) (Moffat et. al, 2017). However, Internet and phone use did not show such benefits for the children (Jackson et. al, 2011). Further studies support these results while measuring other qualities associated with creativity. People who play games have been shown to be more open to new experiences, a personality trait that correlates with creativity (Chory et. al, 2010).

Such studies are just the tip of the iceberg for what skills players gain from playing video games. More studies have correlated video game play with increased cognitive control (how the brain influences behavior to achieve goals), visuospatial skills, cognitive workload, and reward processing (Palaus et. al, 2017). Others have reported that playing games can teach personal accountability since players can only blame themselves for their own failures and must

grow and adapt to overcome challenges (Harrison, 2015). Dealing with such difficulties in games and fighting to beat levels has made gamers more persistent than non-gamers (Ventura et. al, 2013). In the real world, gamers have been shown to be better than the general populous at jobs involving precision and multitasking, including flying drones for the military and even performing surgery (Wright, 2017).

Socializing

While gamers are often stereotyped as socially isolated and lonely, that couldn't be farther from the truth. Video games have brought friends and family together through local multiplayer games that everyone can play on the couch or within the same room. Using the connective power of the Internet, long-distance friends can meet, play, and spend time together in Massively Multiplayer Online (MMO) games or any other game that offers online connection. With over 70% of gamers playing locally with friends and millions more connecting online (Bowen, 2014), games have offered many people a community and social network they might not find through school or work. Friends can not only play together but also talk with each other outside gaming about strategies or other topics relating to their game (Gray, 2018). Some friendships can be developed online through gaming that are as close, if not closer, than those developed through school or at work. Stories abound of online friends supporting each other and celebrating milestones with each other all while never meeting in person. In 2018, a viral story showed five boys, who had all met online and gamed together, visiting their terminally ill friend and hung out "like [they] had done it 1,000 times before" (Thubron, 2018).

The social aspect of gaming is especially important now with the coronavirus forcing people to stay at home. Students no longer can spend time afterschool playing games at each other's houses or apartments and can't spend time with each other like they did at school. To help promote socializing through distancing, the World Health Organization partnered with gaming companies to launch the Play Apart Together campaign (Torbet, 2020). As the name suggests, it advocates for people to use gaming to stay connected with each other all the while preventing the spread of the coronavirus. As the Bobby Kotick, CEO of Activision Blizzard said, "It has never been more critical to ensure people stay safely connected to one another. Games are the perfect platform because they connect people through the lens of joy, purpose, and meaning" (Torbet, 2020).

Emotional Benefits

For most people, video games are a great way to distress after a long day at work or school. In the same way that many watch television, movies, or other streaming services, video games provide a fantastical and engaging world that contrasts with the boring, mundane reality that is homework, chores, and traffic. Researchers have recognized that simply making people happier is an important emotional benefit of games (Bowen, 2014).

The emotional benefits aren't just limited to simply making people happier; video games can also help teach kids how to regulate and control their emotions. Emotional regulation theory states that, through playing, children put themselves through fear-, frustration-, or anger-inducing situations so that they can learn to regulate such emotions (Gray, 2018). Thus, while parents may hear their kids raging or crying about how difficult their game is and

immediately react by taking it away, such actions might actually not be good for the child. By playing these games, children can learn how to calm themselves after such intense negativity. Studies have shown that kids who play games show fewer mental health difficulties and higher intellectual functioning and school competence (Kovess-Masfety et. al, 2016).

Gaming is even evolving to help combat mental illness. Researchers adapted the role-playing game format to develop a game known as SPARX (Smart, Positive, Active, Realistic, X-Factor thoughts) to help combat depression (Merry et. al, 2012). In the game, players control an avatar and progress through areas designed to build certain skills, such as finding hope, being active, and overcoming problems, all the while fighting GNATs (Gloomy Negative Automatic Thoughts), the game's representation of depressive thoughts (Merry et. al, 2012). In their initial trial, the researchers found that playing through SPARX helped participants decrease their depression, anxiety, and hopelessness and resulted in an increased quality of life (Merry et. al 2012). Further, since SPARX is an entirely self-help tool, it would be cheaper and easier to distribute than regular therapists (Merry et. al, 2012). The game is now available on mobile devices, though only in New Zealand.

Exercising

Motion tracking and exercise games became popular with the release of the Nintendo Wii and its game Wii Sports. Following the trend, companies such as Microsoft started working on their own motion-tracking devices, leading to the release of the Xbox Kinect and PlayStation Move and a slew of motion controlled games. While such games can never replace the exercise from playing a sport or working out, they still allow gamers to break up their normally

stationary lives with some movement. A study has even demonstrated that active games such as Wii Sports and Dance Dance Revolution are comparable to walking at a moderate pace (Graf et. al, 2009). Modern games such as Nintendo Switch's Ring Fit Adventure even offer the option for players to choose their exercises all the while engaging the player in a fun, eccentric world and defeating enemies through working out.

Part 3: Conclusion

While video games have been generally panned by media and those in power, those that grew up playing and enjoying them will continue to support them and tout their benefits. The research community is also catching up to the new media, with many studies demonstrating the cognitive and emotional benefits of playing games. Nonetheless, players must still be weary of predatory practices such as microtransactions and need to moderate their own consumption as not to become addicted. Overall, video games seem to have more benefits and can build many valuable skills in players.

Of course, different games will train different skills. Action games train quickly reflexes and efficient multi-stimulus processing while strategy games promote slower and more methodical thinking, pushing player to manage their resources and plan accordingly. Fighting games often require players to develop fine-motor control to execute precision combos while role-playing games can have players develop empathy for the non-player characters (NPCs) they encounter on their adventures.

Since video games are such a new technology and, as they become more immersive and realistic, more research is needed to flesh out its effects on players. Further, with the advent of virtual and augmented reality, studies need to be done to determine how those games affect players differently. Once those in power have a clearer picture about how games affect people, then they can better regulate the industry to avoid the negatives and promote the positives. With gaming becoming larger and attracting more players around the world, it has the potential to spread its benefits through a fun and engaging manner.

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