STS Thesis Prospectus

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

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Peer Review and Comments

Throughout the semester, I have received many comments and suggestions while thinking and writing about my prospectus topic. I'd like to thank Michael Rice, Disha Jain, and Yongyi Jiang for helping me focus my ideas and showing overwhelming interest in my current topic on the psychology of gaming. Since it was already something I wanted to delve into, knowing my classmates are also interested gave me extra motivation to choose this topic.

After writing my first draft of my prospectus, I received some good feedback from classmates and professors. I thank everyone for taking the time to read through my paper and providing thoughtful feedback about where I could improve and topics I should focus on and add.

Hannah Hermann suggested that I approach the regulation of video games through Actor Network Theory. While this is definitely something I could investigate, it's beyond the scope of my topic because I want to focus on how gaming affects our minds and not on other aspects of gaming such as regulations.

Professor Michael Gorman offered many insightful suggestions about topics to address or to dive deeper into. He recommended I do a deeper analysis about how playing different types of games affects the tacit knowledge and skills gained. He further suggested that I find some case studies to better illustrate the effects of gaming addiction and also to explore how gaming can become both fun and informative. I have taken these comments and addressed them in my revisions.

However, I believe that his comment about people representing themselves differently online and having online relationships was a little unclear. I didn't know if he wanted me to address the psychology behind why people want to create different avatars or to address the social aspect of gaming, which I mentioned briefly in the paper.

Finally, I'd like to thank my friends Stephen Shiao, Disha Jain, and CJ Rogers for discussing ideas with me and focusing this paper so that it wouldn't be such a broad and monstrous topic to cover. Furthermore, they've helped me grow and supported me throughout my college years and I'm eternally grateful to them.

Introduction

This topic was inspired by a YouTube video posted by the Game Theory channel that investigated whether playing violent video games cause people to be violent. This video was posted in response to Republican politicians' claims after the El Paso shootings that video games cause violence. It examined psychological studies, crime and video game trends, and even a Supreme Court ruling to conclude that there was not enough evidence to support that playing video games causes people to be violent. After watching the video, I wanted to investigate the topic further and, using the Tacit Knowledge framework, see how playing video games affect our minds in other ways.

The History of Video Games

Video games trace their roots all the way back to the 1950s in research labs. Professors developed games to push the limits of the newly developed computer, developing *OXO*, a tic-tac-toe game, and *Tennis for Two*.[10] All this research culminated in the 1962 game *Spacewar!*, developed by Steve Russell in MIT.[10]

With the advent of the television came the need to further improve on gaming. Ralph Baer, often known as the father of video games[10], began developing and testing the first console. The "Brown Box", known to consumers as the Odyssey, became the first system to utilize the new television sets and also incorporated multiplayer and multi-game capabilities.[10]

While the Odyssey didn't sell well, one of its games inspired the now famous arcade game *Pong* developed by Atari.[10] The first arcade cabinets were released in 1972 to overwhelming success, pushing Atari to release a home console three years later.[20]

Many companies, in an attempt to ride the video game wave, likewise began developing consoles and game. However, supply quickly outpaced demand and the market was flooded with poor quality consoles and games,[20] resulting in the Video Game Crash of 1983.[10] Companies went bankrupt and many games were liquidated, with Atari even burying excess games out in the desert.

In 1985, a Japanese card company called Nintendo began releasing games and consoles for now famous franchises *Super Mario*, *The Legend of* Zelda, and *Metroid*.[20] They further regulated third-party developers to prevent the poor quality games seen a few years prior,[10] thus saving the video game industry and leading to the explosion of video games and genres seen today.

Video Game Genres

Modern games have evolved and divided into a wide variety of genres and subgenres. Here is a list of some of the most popular genres:

- First-Person Shooters (FPS): these games have the player assume the role of a protagonist and often involve fast-paced and action-packed gameplay.[21] Examples include Doom, Wolfenstein, Call of Duty, Battlefield, and Halo.

- Real-Time Strategy (RTS): these games have the player manage resources and units to battle against an opposing force.[11] Popular examples include Starcraft and Age of Empires.
- Massively Multiplayer Online (MMO): these games have many players around the world interact with a shared environment to complete quests, overcome dungeons, and fight bosses. The most popular example is World of Warcraft but other examples include Runescape, Everquest, and Ultima Online.
- Multiplayer Online Battle Arena (MOBA): a subtype of MMOs, these games focus on competitive players and pit two teams against each other with the goal of destroying the other team's base.[21] Popular examples include Defense of the Ancients (DOTA) and League of Legends.
- Role-Playing Games (RPG): these games have players assume the role of the hero and allow them to explore an expansive world,[11] often inspired by Dungeons and Dragons. Popular examples include The Elder Scrolls series, The Witcher, and the Legend of Zelda games.

Other popular game genres include: platformers, rhythm, battle royale, simulations, fighting, sports, survival, educational, and mobile.[13]

Controversies and Potential Harms of Video Games

With such a variety of genres and sub-genres of video games, as well as the relative recency of video games, many people have become quick to blame video games for contributing to the ethical decline of the newer generations.

Excessive Violence

Accusations that playing video games cause violence have been around since the release of Mortal Kombat in 1993,[16] leading to the establishment of Entertainment Software Review Board (ESRB).[7] Such accusations are not baseless; Bandura's classic experiment involving children and Bobo dolls supports this theory. When the children watched videos of adults beating the Bobo doll, they imitated the behavior, even inventing their own ways to "hurt" the doll.[14] Furthermore, the American Psychological Association has concluded that playing violent video games does lead to more aggressive behaviors in players.[30] However, they note that aggression and violence are not the same and that there is insufficient research to correlate playing video games and lethal violence.[30]

Video games have also been blamed for causing recent mass shootings such as Columbine and El Paso, leading to Walmart removing violent games from their shelves.[19] However, such myths are not backed by much concrete evidence. Not only is there no correlation between crime rates and video game sales, many studies have shown marginal, if any, effect between video games and violent acts. Furthermore, a Supreme Court ruling, signed by both conservative and

liberal justices, stated that there has been no definitive proof between playing games and violent behavior.[5]

Violence Desensitization

Evidence for violent games causing violence desensitization is likewise mixed. A study by Grizzard in 2016 showed that there was a decrease in feelings of guilt when participants played violent games.[8] However, a later study by Gao in 2017 showed no correlation between playing violent games and empathy for pain.[6] This seeming contradiction is likely due to how the two studies measured "violence desensitization" and the fact that feelings of guilt and empathy for pain are affected differently by playing video games. Since the idea of "violence desensitization" is an abstract idea, known as a hypothetical construct in psychology, researchers need to come up with ways to measure it, known as an operational definition. Since it is unclear how well the measures accurately match the hypothetical construct, it is difficult to say for certain where the evidence lies.

Loot Boxes

Loot boxes, for those unfamiliar, are a mechanic where players spend premium currency to receive a randomly chosen in-game item, which could be anything from a cosmetic skin to level skips.[25] Such mechanics allow game companies to make millions of dollars on "free-to-play" games. Many people have accused companies of exploiting psychological mechanisms in

players that are often associated with gambling.[9] A study by Zendle and Cairns in 2019 showed a correlation between problem gambling behavior and the amount players spent on loot boxes.[27] Players with more gambling behaviors or at risk for problematic gambling spent significantly more on loot boxes than those who did not have such issues.[27]

Gaming Addiction

Many parents of children who play games often fear that their kids will become addicted to playing such games and that they'll play for hours at a time while not finishing homework, eating, or sleeping. While it might seem outlandish, such fears aren't unfounded. In 2011, Rebecca Colleen Christie was sent to prison for playing World of Warcraft for days on end and letting her 3 ½ year-old daughter die of malnutrition.[24] In 2015, a Taiwan man died of cardiac arrest after playing games in an Internet Café for 3-days straight.[29]

Gaming Disorder has even been defined in the World Health Organization in their International Classification of Diseases (ICD-11) as persistent or recurring gaming behavior that impair or takes precedence over regular life activities,[22] similar to symptoms of substance addiction. However, the disorder is not listed in the DSM-5, the most widely used reference for psychological disorders, with gambling being the only activity listed as a possible addiction.[18] People who exhibit signs of video game addiction are often impulsive, have a higher acceptance and lower social skills, and have trouble coping with regular life, signs also related to ADHD, depression, and anxiety.[24] Many also blame game companies for exploiting psychology and

manipulating players with micro-transactions, loot boxes, and even being so immersive that players can use them to escape from the real world.[22]

Potential Benefits of Playing Video Games

While media tends to report on the controversies and issues with modern gaming, as those topics generate the most views and money for them, they are less quick to talk about the potential benefits of gaming. Similar to how there are psychological systems involved when we watch and interact with in-game violence, there are other psychological systems at work controlling our hands, processing what we're seeing on screen, and thinking about how to proceed.

Increased Brain Connectivity

Gaming has been shown to trigger neurogenesis (the building of new neurons and connections) in the brain. A study in 2013 had participants play Super Mario 64 and used MRIs to measure brain volume before and after.[12] They found that volumes of gray matter in regions of the brain associated with spatial orientation, memory formation, strategic planning, and fine motor skills had increased significantly and that such changes were more pronounced the more the participant desired to play the game.[12] Such changes make sense because games require the fine motor skills to operate the controller as well as other cognitive functions to orient oneself in the world, remember where one has previously visited, and plan how to tackle certain areas.

Furthermore, a meta-analysis of 116 articles found that games also benefitted player's attention, cognitive control and workload, visuospatial skill, and reward processing.[17] While there were some limitations to the analysis, namely that many research methods were non-standard,[17] this is further evidence that playing games helps our brains grow and adapt.

Staying Fit

With the release of the Nintendo Wii and other motion-controlled games like Just Dance, people now have the option of exercising in the comfort of their own home through gaming. A study from the University of Oklahoma has shown that playing active games expends about the same amount of energy as moderate walking.[7] Thus, for those who are mostly sedentary or might not be motivated to pay for a gym membership, exercise games are a great alternative to watching television or slowly walking on a home treadmill.

Other Benefits

Games can offer a host of other benefits outside of improving physical and mental well-being. Many people play games to relax and have fun after a stressful day or learn to be more resilient through in-game failures and trials.[4] And while the stereotype of a gamer is that of an antisocial, awkward person, playing games can actually be a great social catalyst. 70% of gamers play with friends locally and millions more interact with people around the world through MMOs and online multiplayer games.[4]

Playing video games can also alleviate some mental disorders and aging. A game called SPARX was designed to help treat depression and a study showed that it could be used in a primary care setting.[15] To combat age-related decline, a University of Iowa study has shown that playing 10 hours of a visual speed of processing game can slow down or even reverse the effects of aging.[26]

Conclusion

While conventional media and older generations may denounce games as causing mass shootings or contributing to the ethical decline of the world, they are ignoring all the benefits that playing games can have. While it is true that playing certain games results in aggressive tendencies and that gaming in excess can lead to addiction and day-to-day impairment, that is also the case for any number of behaviors such as gambling, drinking, or substance abuse. Companies may want to exploit our psychology through loot boxes and micro-transactions, but that's encouraged in our capitalist society. Moderate gaming has been shown to improve our minds, bring people together, and even help combat mental issues.

Using the Tacit Knowledge framework, playing games over time allows players to learn the mechanics of games and develop new strategies for overcoming obstacles, all the while improving the fine motor control in their hands to perform more and more complicated inputs. Such a wide variety of game types and genres can give players different forms of tacit knowledge. For example, fast-paced action games such as FPSs or racing games can help train quick reflexes for on-the-fly adaptation and reactions. Slower paced games such as RTSs,

simulation, or puzzle games can help players develop strategic planning, resource management, and multitasking skills since they need to balance resources to defeat an opponent. Fighting games and platformers may help with fine-motor control as players have to execute precision combos and jumps to accomplish their goals. RPGs and Adventure games can build problem solving skills through their puzzles and dungeons as well as empathy from interacting with both other people and non-playable characters.[28]

After seeing the different positive effects of playing games, how can games evolve to provide the maximum benefits to their players? While most games will still adhere to the pre-defined genres (FPS, RPG, etc.), they could integrate aspects of other genres to create new hybrid genres. Fast-paced action games could include slower, puzzle-solving sections to have players also exercise problem-solving and critical thinking. Slower games could include sections where events occur rapidly, forcing players to learn quick reflex and fine-motor skills to effectively react to the situation. Such a mixing of genres can help players develop more skills that they can apply to the real world.

Further, games can add aspect to educate players about real-world events. Some modern games already do so. For example, Civilization 6 added a new climate mechanic to help players see how climate change can affect the progression of their empire. In the most recent Pokémon game, a coral Pokémon from a previous generation became white and bleached, clearly showing that climate change is killing coral reefs and the oceans. The more that games show these modern problems, the more visible these issues will be. Since most people who play games are in the younger generations, knowing about these issues could push them to act to solve them.

Resources

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