Exploring Addiction Mechanism of Different Game Types

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Abstract. Video game addiction is a term that describes games that dominate a person most of the time. However, the degree of addiction and the amount of time spent playing vary from one type of game to another. So this literature review will explore the mechanism of addiction in terms of different game types, analyzing the relationship between the causes of game addiction in terms of 3 models (dopamine, operant conditioning, and feeling-state theory). In order to figure out what the most attractive type of game is, This is done by classifying all kinds of games into 10 categories and creating a ranking list for all games from 5 different websites. Those websites are chosen randomly from the search engines such as Google and Bing. The results are based on prior studies that looked into the causes of game addiction in each category and analyzed those games by three models. The results suggest that the mechanism of video game addiction varies between games.

Keywords: Addiction; mechanism; different game types.

1. Introduction

People of all ages can become addicted to video games for a range of reasons, including social influences and the mechanics of game addiction, as well as personal factors. The family environment is also a factor in gaming addiction in terms of technological advances by gaming companies. Many parents decide to give their children electronic devices to replace themselves. Recent studies have explored gender as a factor that influences people's addictions, as the results found a significant difference in the level of Internet gaming addiction between male and female adolescents in India. In addition to social factors and gender, male adolescents are at a high risk of developing an online gaming addiction [1]. Secondly, economic development has contributed to the worldwide development of technology and game programming, which has allowed game companies to make significant advances in their products, especially in terms of game types (addiction mechanics, reward design), rendering, and game promotion. As a result, more people are choosing games as a tool for leisure or using them as an escape from reality or even overplaying them, leading to a dependence on them.

Massively multiplayer online role-playing games (MMORPGs) could be a good example of why people become addicted to them. Lee et al. [2] find that the severity of MMORPG addiction positively correlates with both perceived positive mood enhancement and perceived negative mood decrease, suggesting the significant significance of the dual of hedonic effects in such an addiction. Additionally, we found that only the affordances of success and immersion have substantial, positive correlations with the elevation of reported positive mood and the lowering of perceived negative mood. The strongest linkages may be seen in the affordance of immersion. This finding may be explained by the distinctive features of MMORPGs [2]. Although Lee et al.'s explanation for addiction is clear, the results found in MMORPG games may not be applicable to other game types [2]. So this literature review will explore the mechanism of addiction in terms of different game types, analyzing the relationship between the causes of game addiction in terms of dopamine, operant conditioning, and feeling-state theory.

2. Method

To reach the goal of this rarticle, figuring out what is the most attractive type of game, the authors have designed the method of classification, selection (about what exact games the authors are using for the after steps), and comparison while trying to make the final result as subjective as possible.

Firstly, for the classification of games, the authors decided to separate all games into ten types of games, based on the classification on the site of HP by Pavlovic [3]. And the ten types of games are (1) Sand box; (2) Real-time strategy (RTS); (3) Shooters (FPS); (4) Multiplayer online battle arena (MOBA); (5) Role-playing (RPG, ARPG, and More); (6) Simulation and sports, Puzzlers and party games; (7) Action-adventure; (8) Survival and horror; (9) Plat-former; (10) Puzzler. Secondly, in the selection part, the authors consider that the popularity of games is more significant and authoritative than the quality of games. Therefore, the method designed has an inclination toward popularity of them. The rank lists searched online are selected to be an important index of games for judging if this game should be included in the research. About one type of game, five ranking lists from five different sites evaluating a variety of games, are chosen randomly from the search engine (Google and Bing have been used the most), and then they are shown in Fig. 1.

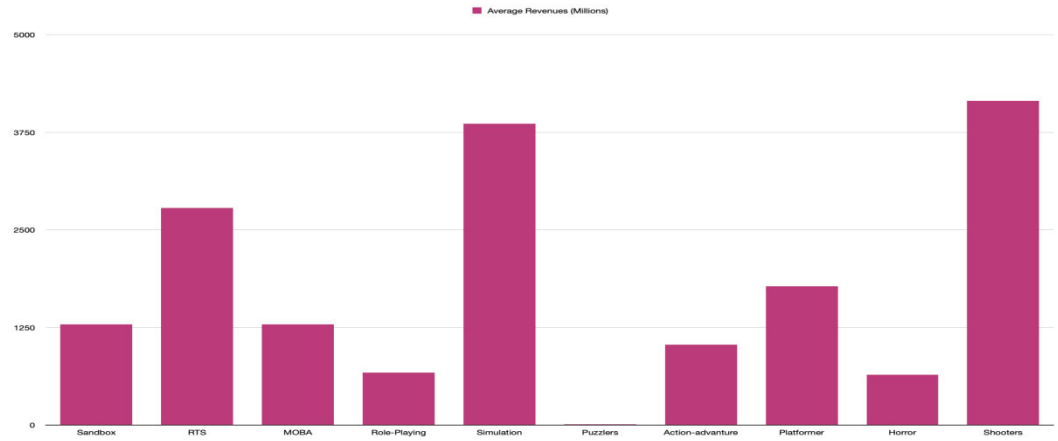


Fig. 1 Comparison between all types of games

3. Literature Review

3.1 Definition of Video Game Addiction

According to Wikipedia, The general definition of video game addiction (VGA), also known as gaming disorder or internet gaming disorder, is the problematic, compulsive usage of video games that significantly impairs a person's ability to perform in a variety of life areas over time. When a person prioritizes gaming over meeting everyday obligations or pursuing other interests without considering the consequences, they may have a disorder. As defined by the ICD-11, the main criterion for this disorder is a lack of self-control over gaming. The characteristics of video game addiction are developed by the American Psychiatric Association (APA). There are nine criteria that define video game disorder, which is pre-occupation, withdrawal, tolerance, reduction, giving up other, despite problems, continuing to deceive, avoiding negative moods, and risk of losing relationships and opportunities. First of all, Re-occupation is the term used to describe someone who spends a lot of time thinking about games even when they are not playing or intending to play them. Second, withdrawal is an emotional change that occurs when a person is unable to play video games, including feelings of restlessness, irritability, depression, anger, and anxiety. And lastly, tolerance. A person has a higher tolerance for video games since playing them causes less dopamine to be released than it did when they initially started, which makes them want to play them for longer periods of time. Then cut back on or quit playing video games. One of the traits of gaming addiction is giving up other

activities. For instance, a person's interest in other forms of recreation may diminish as a result of gaming. Gamers who play continuously despite issues do so despite being aware of the bad effects that can result from their behavior, such as not getting enough sleep, being late for class or work, spending too much money, screaming at other people, or neglecting crucial responsibilities. Gamers who have been deceived may have lied to their family members, friends, or others about how much they play. Gamers attempt to escape from or forget about personal issues, as well as relieve uncomfortable emotions like guilt, worry, helplessness, or depression, in order to overcome negative moods. End up losing relationships A person who engages in gaming stands the danger of losing important relationships, jobs, and educational or professional chances [4].

3.2 The Factors Influencing Video Game Addiction

In our attempt to understand the causes of different types of gaming addiction, we found that all games can be classified into ten types. Each game type also has different mechanisms for the development of addiction in terms of biochemical, behavioral, and cognitive reasons.

3.2.1 Biochemical factor

Dopamine is one of the primary factors that affect gaming addiction. It is mainly responsible for the brain's eroticism and sensations, sending messages of excitement and pleasure. It also motivates people to act and satisfy their desires and is linked to various addictive behaviors. In other words, the brain has a "reward center" controlled and regulated by dopamine. When you are playing a video game, this reward system will be triggered, and the brain secretes dopamine. For example, the visual impact of the game stimulates dopamine secretion. The findings of Schott et al. [5] support the claim that "reward anticipation" also stimulates dopamine secretion to make people happy and excited, which can lead to excessive game playing and addiction. "Reward anticipation" can be divided into fixed and variable rewards, with the rewards themselves depending on the settings of the different games themselves. "Fixed rewards" are rewards that can be calculated and are easily predictable in terms of cost and value. For example, completing a relative task will result in a corresponding reward. With "variable rewards," the cost and value of the reward are unpredictable, as the reward is random. For that reason, variable rewards make the expectation of a reward possible for every action, which secretes dopamine and motivates the player. For example, in the case of CSGO, every time you open a box, there is the possibility of a valuable gun skin, which is equally attractive to those players who have different amounts of money because the probability of valuable skins appearing has been determined by the game company, and this probability is typically quite low. The "fixed reward" is more reliable than the uncertainty of opening a box. Other game companies besides CSGO will set a lower limit for the availability of costly items. Thus, by making it easier for players to get valuable items, such items act as positive reinforcement and encourage player addiction. In this case, "variable rewards" are more addictive than "fixed rewards." Nevertheless, some studies suggest that there is a genetic component to addiction and that if a person has fewer D2 receptors, they are more likely to become addicted. Therefore, genetics has an impact on addiction [6].

3.2.2 Operating conditions

One of the three contributing factors to video game addiction is operating conditions, which involve punishments and reinforcements. Positive reinforcement theory can be divided into two distinct classifications: continuous reinforcement schedules and variable reinforcement schedules. Continuous reinforcement is the method of repeatedly giving a reward to encourage a particular behavior. Whereas variable reinforcement schedules are a form of partial reinforcement in which only a fraction of answers are reinforced, and there is no set pattern. Both reinforcement schedules play a crucial role in enhancing addictive behavior. In an attempt to make the game more appealing to players, some video companies create a balanced system of rewards and punishments that may allow more players to find that the game is becoming more interesting. The role of the reward increases the likelihood of players repeating their excessive play behavior [7].

3.2.3 Feeling-state theory (FST)

Feeling-state (FS) refers to the entire psycho-physiological arousal of the body and its connection to the memory of a particular behavior. The feeling-state is constituted of all the thoughts, feelings, and sensations that a person has in connection with a specific event. Additionally, physiological arousal, such as adrenaline release and an increased heart rate, may occur. Even early positive feelings states can influence subsequent behavior since these feelings states will persist over time and under many conditions. This cognitive approach is used by Miller [8] to explain how intense and pleasant feelings might be connected to particular behaviors, such as gaming addiction. The creation of an emotional state consists of intensely positive emotion and a memory of the behavior. As a result of compulsive behavior and the desired feeling, the trigger event and feeling-state are activated. The underlying causes of gaming addiction are the same regardless of the game type, but the associated pleasurable feelings, thoughts, and memories of excessive behavior are entirely different [8].

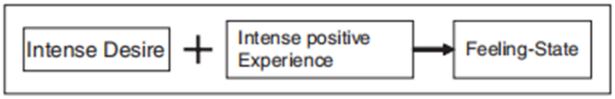


Figure 1. Creation of a feeling-state

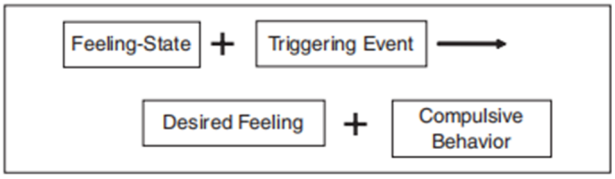


Figure 2. Activation of the compulsive behavior

Fig. 2 The "Figure 1" and "Figure 2" are the model of feeling-state from Miller [8]

3.3 The Characteristics of Different Types of Video Game Addiction

There are several characteristics found in different types of video game addiction. The results from the current study show that gamers who play Arcade and Shooting have significantly lower self-esteem, conscientiousness (Racing), empathy (RPG), and sense of community (Racing and RTS) compared to ordinary people, which means that game addiction is related to personality traits [9].

3.3.1 The mechanism of addiction in First-Person Shooting game (FPS)

According to previous studies, FPS players showed much greater levels of tolerance, withdrawal, and neglect for regular living than users of other types. According to earlier studies, FPS games have a larger share of high-risk addicts than other game types. The present study's findings indicate many causes for people's addiction to shooter games. First, as may be viewed as one of the fundamental characteristics of FPS types, the results have revealed that rewards or achievements in games, as well as social aspects of games, lead to excessive game use. Second, players might become more immersed in certain game types as a result of the technological breakthroughs in computer specs that today's games can provide, such as real-time multiplayer and vivid graphics and sound. In particular, FPS games may connect players connect with the characters they play or even experience a phenomenon known as "transmission," when players project their own personalities onto the characters they play. Gaming can help people deal with these situations by allowing them to express their feelings while also increasing their immersion in the game. The immersion experience of First-Person Shooter games can be improved by combining them with new media, such as virtual reality [9].

On the other hand, the cognitive perspective might be able to explain how shooter game addiction works. The Feeling-State Theory claims that intensely positive emotion and a memory of the behavior make up the feeling-state [8]. Applying the feeling-state theory to First-Person Shooting games, positive feelings include a sense of accomplishment and cooperation, as well as social interaction with other gamers. Whereas the memories may be of challenging clutch situations like 1 vs. 4 or 1 vs. 5, they may also be of outstanding play and tactic execution. The memory of a game is accompanied

by physiological events, such as an increase in adrenaline at the same time. An excessive amount of shooter games are played as a result of trigger events and emotional states. The trigger event may be the next time a player plays a shooter game or even just the thought of playing games.

For example, counter-strike and Tom Clancy's Rainbow 6 Siege have ranks, so the motivation for playing excessive amounts of shooter games is due to their desire for a higher ranking. Therefore, the higher ranking could be a positive reinforcer for the game, which helps to push them to new levels. This behavior of addiction is formed by positive reinforcement, like a reward.

3.3.2 The mechanisms of addiction in Real-time strategy game (RTS）

In Real-Time Strategy (RTS) games such as "Star-craft," "Company of Heroes," and others, many players engage in real-time brain battles that necessitate quick and accurate battlefield judgment, analytical ability, and meticulous strategic thinking to achieve goals or victory. Achieving these requirements may enhance a player to a higher level of gaming status or ranking. The previous study discovered that compared to users of other types, RTS players demonstrated much higher levels of tolerance, withdrawal, and neglect of daily life. There are four dimensions into which RTS addiction can be subdivided. At first, rewards or achievements from games and the social aspects of games encourage excessive game play. Games of these types assign players ranks or ratings based on individual victories, and players with a lot of victories are praised in the gaming community. They eventually abandon real-life connections as a result of their network-based presence in the virtual world, which encourages them to become more immersed in gaming. According to operant conditioning, receiving a reward or ranking in a game is perceived as continuous reinforcement that develops the behavior to become more addictive over time [7]. Second, considering that appearance has an impact on game immersion, modern advancements in computer specifications that provide gaming environments where players may interact with one another in real time while experiencing outstanding sound and images may increase players' immersion in certain game types. The purpose of immersion is to remove you from the "actual world" and transport you, along with your brain, to separate reality, allowing addicts to escape from the real world [9]. Thirdly, RTS games would create a sense of community since some adolescents have a sense of community through their school environments. According to recent research, those who score highly for gaming addiction have a strong sense of community online, but a poor sense of community online play. This might be due to the fact that successful virtual interactions and outcomes diminish the scope and depth of real-world social interactions and eventually heighten the sensation of disconnection from reality-based communities. Participants who frequently play RTS games have seen this trend [9].

3.3.3 The mechanisms of addiction in Massive Multiplayer online role-playing (MMORGs)

Although a part of role playing games provides online functions for players, trying to be more 'addictive,' more sessions in games and more parts of all role playing games are actually set for the establishing a fine storyline and stimulating players' minds through details and fancy graphics, which means that parts of the theories conducted previously toward the part of socializing functions of games basically cannot work in the area of role playing games.

Moreover, what effects more? Based on previous studies, role playing game addiction relates to the achievement and immersion affordances that have the duality of hedonic effects. Then, because of the hedonic effects, both mood enhancement and negative mood reduction are conducted, which appropriately proves that the two triggers (achievement and immersion affordances) are highly related to the extent of Role playing games (RPG) [10].

However, the operating conditions might be the decent factors that make players addicted to Role playing games, while it works on both sides (continuous reinforcement schedules and variable reinforcement schedules). For the continuous reinforcement schedules, in role playing games, a variety of rewards are extremely usual things that are used to keep players' passion. As long as players are playing the games, they will complete the missions or goals in games, while rewards such as game currencies, value of experience, or special skills, will be provided to players, stimulating players' brains and bringing pleasure and a sense of achievement. The variable reinforcement schedules it is

not stable as a mode of gaining rewards in role playing games. They are changing all the time and gaining the expectations of players. For example, sometimes players can get a very small reward by accomplishing a complex mission, but sometimes it is also possible to get a gigantic reward or stimulation when players are paying a very minimal price. It means that role playing games have much uncertainty of reward, which is the motivative factor that makes stick players to them and can be called variable reinforcement.

3.3.4 The mechanisms of addiction in Horror game

Before horror games were created, the horror type was widely used in other ways, such as stories, films, and actual playing houses. Previous studies have searched for the factor that makes people like horror things, although they are scared (physically). For example, according to Fukumoto et al. [11], the subject's breathing increased in intensity and its cycle was reduced to the point where it was causing fear sensations in them, which relates the psychological changes with the physical changes effectively, through the clear data [11]. Moreover, about the horror games, Vachiratamporn et al. have explored deeply; they found that When the players were in a suspense state as opposed to a neutral condition, participants were more likely to feel terror from a terrifying incident. Players with this condition only felt terror after being startled. The player effects classification using heart rate data produced the greatest results, with up to 90% overall accuracy. It supports us in understanding how people are terrified by horror games [12].

On the other hand, the feeling state theory can also explain why people love horror games. The directors use factors such as dark scenes, unstable angles of shots, and the sudden appearance of human-like and ugly faces trying to make people scared- heart bumps faster, increased sweat, and screaming aloud. It is the same as the feeling state theory that horror movies try to trigger physiological arousals, such as adrenaline release and an increased heart rate. Then, after the horror games threaten the players, the memories of "scary moments" are conducted and contained by their brains. Finally, the next time when players encounter this kind of events, in similar trigger events and feel states, the desired feeling and the compulsive behavior of playing horror games will be triggered. Therefore, the feeling state theory might describe what happens in people's bodies when they are playing horror games and how they get more and more addicted to them [7, 13].

4. Implications

This research has the value of exploring new areas and inspiring other explorers in the future. Initially, although game addiction has been developed for a while, the aspects of comprehensive exploration of probably all different game types have not been tested or stepped on. Therefore, this research has released a new area about the different possible origins or cautions for different types of games. Moreover, this research tries to give inspiration about people about game addiction now just a single kind of "illness" [14, 15]. Albeit others have emphasized a bit about some parts of how the addictions are developed, we also should focus on more details in different aspects. For example, when people's son or daughter is addicted to games, people should think more about questions beginning with the word "why" and "how, to reduce the effects of addictions. Also, the authors hope the research can give an epiphany to readers about the various types of game addiction with unique origins. While when they consider the therapies, the therapies should be specialized more according to the different types of games.

In addition, in the method part, there is a general survey based on the popularity of games, showing which types of games people love more. It should have some commercial value for people who want to invest in companies, helping them to recognize the actuality of types of games.

5. Conclusion

In conclusion, this research has found three ways to appraise or recognize how people become addicted to different games while providing a data survey based on the data collected from the internet.

The research has separated reasons for game addictions into three theories: dopamine, operant conditioning, and feeling-state theory finding support from the previous studies. Then, in the method part, the authors selected by focusing on the popularity and comparing the revenues of each type of game (a total of 10 of them), conducting a result histogram which shows the amount of how people like each type of game. The implication, this research might help future studies to recognize that game addiction is not just a single type of illness. By defining how addictions are conducted or emerge by the three mentioned theories, game addictions have various origins and should have more specialized therapies for treating them.

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