

Video Game and Its Effect on Mental Health

Yanshan Lin

International School of Beijing,
Shunyi District, Beijing 101318
China

Lucy.lin@student.isb.bj.edu.cn

Abstract:

The rapid growth of the video gaming community over the past decades has brought into sharp focus its impact on individual psychological health, particularly among adolescents. This paper aims to explore the positive and negative effects of video games on mental health and proposes constructive solutions for developers to foster the development of a healthy online gaming community. Research indicates that video games have the potential to enhance cognitive abilities, strengthen social connections, and provide emotional support. However, they also pose risks such as gaming addiction, sleep disturbances, and social impairments. To address these challenges, it is recommended that developers implement measures including the design of healthy gaming mechanisms, the establishment of positive community guidelines, and collaboration with mental health professionals. Through these efforts, game developers, publishers, and the broader gaming community can work together to create a gaming environment that is conducive to the psychological well-being of users, forging a better gaming future for all of humanity.

Keywords: Video game; effect ; mental health

1. Introduction

Video games have become an indispensable part of 21st-century society. Since the first video game, "Tennis for Two," was invented, they have been evolving rapidly, emerging as a ubiquitous media that attracts people's attention from all age groups, especially the younger generations. In particular, 3.32 billion active gamers have reported gamers in 2024, a cogent figure highlighting its significance in modern times [1]. As technology advances, more immersive and interactive elements have been developed; what originally was a simple game with a two-dimensional

graphic display can now submerge people in different dimensions and planets. The rapid technological advancements have allowed the gaming experience to grow drastically.

However, as they become increasingly involved in daily human life, an important matter must be noted: the potential impact of this format on mental health. Mental health has also been a vital topic that has been austere discussed in recent years. It has a tremendous effect on people's daily lives that individuals should not ignore. Since gaming is considerably a newer medium, its impact on an individual's mental

health, both positive and negative, needs to be taken seriously attention on. Populaces should be able to properly and objectively understand their ability. In the past few years, various research has been published on such topics, and game developers have been working with psychology experts to create possible pathways that allow the public to understand those potential impacts and find solutions to address the potential negative influence of video games. Although much research has been done in the case of games and psychology, there is a lack of research on how to disseminate practical knowledge about health to the general public in this field. For this reason, this paper will provide ways to benefit and educate the public.

This paper will explore the complex relationship between video games and mental health, examining the potential benefits, such as increased skills, and the risks, such as inducing mental issues. Using different supporting pieces of information on such topics will provide a comprehen-

sive understanding of how the emergence of video games could impact individuals on various levels. At the same time, it will provide possible ways to allow the general public to understand the influence thoroughly.

2. An Overview of Video Games

To begin with, one must understand the gaming demographic to comprehend this topic thoroughly. Research has shown a vast upward trend in the gaming industry. Specifically, it has risen by over 1 billion in just eight years. As shown in Fig. 1, in 2024, there are reported 3.32 billion gamers worldwide, with 38% of gamers aged 18-34 years old, with 20% under 18 as a close second. This shows that gaming focuses on the younger generation as its target, demonstrating its ability to shape our future world—also, approximately 1.7 billion male and 1.39 billion female gamers worldwide [2]

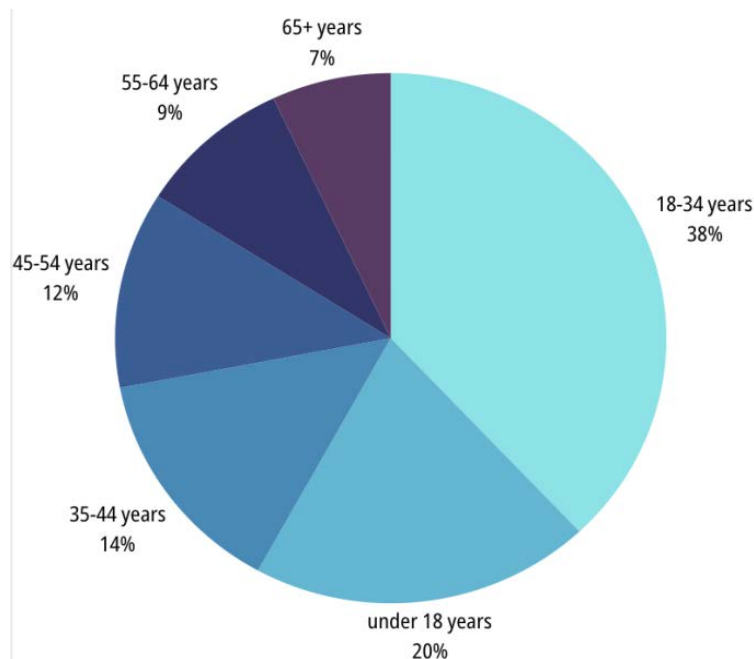


Fig. 1. Global Gamer Demographics of Age Distribution in 2024 [2]

Compared to 2006, when only 38% of gamers were female, it is clear that gaming is also significantly growing in popularity in the young female population. In addition, most players (63%) have been reported to be playing “casual games” to unwind, relax, and decompress (66%) [3]. This shows the possibility that when individuals receive information, they are in a state where they are not carefully analyzing the information provided to them, which could indicate that they are absorbing whatever information the games are injecting them with. Once again, it highlights the importance of spreading positive and beneficial information on gaming platforms.

3. Positive Impact of Video Games on Mental Health

3.1 Improve the Development of Essential Cognitive Skills.

First, video games indeed have several positive impacts on individuals. One is that it has been proven to improve skills, specifically in developing essential cognitive skills. Cognitive skills are the skills occurring in human brains; some common ones include reading, learning, remembering, logical reasoning, and paying attention [4]. The pro-

cess begins with hands-on learning that establishes object permanence, causal effects, and image-based thinking. It then moves on to the implantation of abstract thinking and unconscious memory and then to the development of explicit memory. Depending on the individual's age, games will have a different impact based on the level of development. Overall, to the genre demographic, the repetitive concentration required in video games allows individuals to develop multiple skills unconsciously. Playing video games has improved from "perceptual abilities to high-level skills such as fluid intelligence and creativity" [5]. This was doubtless due to a common feature of video games, which is the standard requirement of critical thinking with a high level of focus.

Most of the time, players must analyze the situation, weigh options, and make intelligent decisions to progress the game. This process is already attention-requiring, but repeating this process allows the individual to grow split-second thinking skills while still feeling entertained. As an example, in the game "Tetris," players need to quickly rotate and adjust falling geometric shapes to create a complete horizontal line. This repetitive process trains the individual's reaction rate and quick decision-making skills. This indicates that gaming can benefit one's mental health, helping individuals develop and grow as a more rounded person.

Furthermore, there has also been a study of around 2,000 children that concluded: "Those who reported playing video games for three hours per day or more performed better on cognitive skills tests involving impulse control and working memory compared to children who had never played video games." [6]. Considering that the significant demographic encompasses a younger generation, introducing enhanced cognitive skills will allow them to gain valuable lessons that they might not be able to learn in an otherwise traditional education setting. This may benefit them later in life, as these essential skills allow youth to thrive in real-life settings.

3.2 Sense of Mastery and Accomplishment

Another way gaming could benefit individuals is by allowing them to feel a sense of mastery and accomplishment. Video games often have a rewarding system; this includes trophies to win or item collection. As the player gets closer to the reward, they will build high anticipation and excitement. This process will allow dopamine release, encouraging the player to continue. At the same time, once the goals are reached, the player will feel a sense of satisfaction and accomplishment; this positive response will also cheer them to continue the gameplay. This system will also allow for two kinds of motivation: Intrinsic

motivation, which arises from internal factors, such as joy during play and a sense of fulfillment, and extrinsic motivation, involving exterior rewards, such as trophies and virtual currency. This mechanism not only enhances the gameplay experience but also allows the user to continue developing essential cognitive skills and the ability to work toward a long-term goal.

Additionally, most video games will have short-term and long-term rewards. Short-term rewards can be achieved quickly, including points and achievement. In contrast, long-term rewards require more extended gameplay and effort to reach, such as unlocking new levels or characters. On the one hand, long-term rewards will give the player something to work towards, building constant anticipation and excitement. On the other hand, short-term rewards will allow the player to feel entertained and joy while working towards more significant rewards. Thus, by allowing dopamine release, video games will enable individuals to be more motivated towards a set goal and gain joy and excitement through the experience.

3.3 Social Development Skills Under Multi-player Settings.

Additionally, video games also allow individuals to gain essential social-psychological skills. By providing an anonymous environment, gaming offers a low-cost social environment for people with social anxiety or shyness. This can allow them to socialize, providing a platform for recovery. To be specific, some individuals with social anxiety view online space as a "safe space" where they can engage socially without the immediate pressure and judgment that come with in-person interactions. In fact, during COVID-19, Roblox, a popular game that has reported an average of 31.1 million users per day, has reported that "Gaming is one of the main ways that children and teens socialize during this time of social distancing.... more than half of teens prefer to catch up with friends through gaming." [7]. Again, this illustrates the impact gaming has on modern individuals' social lives and how it can ease socialization stress for those struggling with it.

4. The Negative Impact of Video Games on Mental Health

4.1 Dopamine and Gaming Addictions

Despite the fact that video games have a positive impact on individuals, it is also essential to understand their potential adverse effects. One of them is the possibility of developing a gaming addiction. As mentioned, video games contain a reward system that leads to triggering

dopamine release. This constant relapse of dopamine provides the player with continuous short and quick stimuli to the brain, making the individual want to play more. Although this could give the individual positive gameplay and possible learning experience, this purposeful lengthening of playtime could also lead to an unhealthy level of craving and addiction. In other words, if the player does not have a decent level of self-control or external control, gaming can be damaging to the mental health of that individual. As an example, a survey of 393 gamers (males: 58.3% vs. females: 41.7%). Have shown that “63.1% of the respondents reported playing video games daily, with an average of more than five hours of gaming time per day (25.2%).” This demonstrates that the prevalence of gaming addiction was 62.1%. Specifically, those who are “young, playing video games every day, playing more than three hours per day, and playing multiplayer games” are more likely to be exposed to gaming addiction [8].

Furthermore, the release of dopamine has also been seen as a common factor in other addictions and disorders, including gambling and substance abuse, which all include short-term positive stimuli to the brain that induce the individual to want more. Recent neurological research has shown “similarities in the brains of people with video game addiction and substance use disorders.” Thus, gaming could potentially become a significant issue. Gaming addiction can be significantly problematic to an individual and often has a severe impact, just like any other addiction. Individuals may experience withdrawal syndrome such as “sadness, anxiety or irritability when games are taken away or gaming isn’t possible.” [9]. Individuals with such addiction may also need gameplay to obtain a certain level of enjoyment. At the same time, this could also indicate giving up activities or hobbies they were once interested in. Therefore, an excessive amount of gameplay has the potential to lead to a gaming addiction.

4.2 The Correlation Between Extensive Gaming and Mental Issues.

Moreover, an extensive amount of gameplay has also been tested to have a direct relation to mental issues such as anxiety and depression. Spending an extended amount of playing time means that the individual will be staring at the screen for a long time. Since gaming often requires high concentration and consecutive attention, such long hours spent could make the individual socially isolated, which has been proven to have a direct correlation to symptoms of depression and anxiety. To add on, those who are suffering from mental illness and have long playtime are also likely to create a vicious cycle in which they will use gaming as a coping mechanism, which will

further aggravate their mental health issues. In addition, those who spend such an excessive amount of time also can ignore their real-life relationships and connections, which can also lead to isolation. Adding on, there has been shown a positive correlation between ADHD individuals being more likely to use gaming addiction. According to recent studies, excessive amounts of gaming have also been proven to worsen ADHD symptoms, while young males are more likely to fit in such groups. This shows that if gaming is not adequately controlled, it can have a significant adverse effect on individuals. In fact, studies have also demonstrated a direct correlation between individuals with gaming addiction and ADHD, with more than half (59%) of the participants having gaming addiction as well as ADHD [10]. Therefore, if video games are not correctly handled, they can severely affect an individual’s overall mental well-being.

4.3 Social Dynamics Within Specific Gaming Communities as a Potential Threat

Besides the direct impact video games have on mental well-being, certain gaming groups and environments also pose potential threats to those who are significantly exposed to them. First, socializing in an internet setting provides a decent degree of anonymity, which results in many speaking their mind and overseeing the potential consequences. This could be a fuse to an increase in toxic behaviors, which encompass a series of abusive behaviors such as bullying, harassment, and disocclusion. With the constant negative input, individuals who are constantly exposed to it may begin to experience mental discomfort, which can potentially lead to symptoms of mental illness. The study “*Computers in Human Behavior*” found that players often encounter negative interactions, leading to increased stress, anxiety, and feelings of inadequacy. Additionally, studies have also shown that toxicity is often associated with “lower in-game social capital, need satisfaction of relatedness, and higher loneliness.” Similarly, studies have also shown an increase in harassment from 67% in 2022 to 75% in teens and preteens, specifically in online multiplayer games. Even more, socialization within the gaming community might also pose a danger to an individual by inducing comparisons between individuals and others, which might lead to low self-esteem [11]. The research, *Computers in Human Behavior*, shows that gaming will encourage players to evaluate their performance relative to others. This comparison can induce pressure to perform better, particularly when that individual is falling behind. Such toxic behavior may make what originally is a relaxed environment to a competitive one, causing more stress on an individual’s daily life. Therefore, we can con-

clude that if socialization within the gaming community is not properly controlled, it can pose significant negative effects on one's overall mental health and have serious consequences.

5. Balancing the Positive and Negative Impacts of Video Games: Strategies for Game Developers

5.1 Incorporating Design Elements that Encourage Beneficial Gameplay

After understanding the positive and negative effects of gaming, one must be aware of the importance of a balanced gaming habit, which leads to an important issue: how can the developers help? In fact, there are several ways. One example is to incorporate a system that will reduce potential gaming addiction development. This includes setting time restraints on the amount of playtime, allowing parental supervision, and even rewarding positive gaming behavior. As an example, to restrain playtime, developers could include sending simple notifications or just simply having a clock somewhere on the screen. By doing so, players will be more aware of the hours they have spent. A study published in *Cyberpsychology, Behavior, and Social Networking* has found that simply making time more will allow individuals to better regulate their gaming behavior [12]. Similarly, rewarding (such as giving gaming items or currency) positive gaming behavior, such as awarding players who take breaks during playtime, will encourage individuals to relax. Providing a positive reward for taking breaks or shortening their hours will provide a positive correlation between positive gaming habits and a positive gaming experience, which will make the player more likely to develop an upright gaming habit on their own.

To add on, one of them is to incorporate design elements that encourage beneficial game plays. This would be especially beneficial to individuals who may have pre-developed mental illness. Although it cannot be concluded that gaming will directly cause mental illness, there is evidence of a direct correlation between the two. Thus, developers should be more aware of this proportion of their audience and be more considerate when it comes to adjusting and developing based on the audience's needs. To do so, gaming companies can incorporate beneficial elements that could reduce different risk factors. As an example, developers can include "Dynamic Difficulty Adjustment" (DDA), which allows individuals to change levels based on their real lives. Specifically, by changing the difficulty when the player faces challenges to match

their abilities, they are more likely to the stage of flow—a state of deep engagement and enjoyment. This could be achieved by incorporating AI to analyze individuals' performance and adjust the difficulty accordingly. By adding this feature, developers could ease the stress that individuals might experience during gameplay and create a more inclusive environment that is joyful for both novice and experienced players. It might even be beneficial to those who may have symptoms related to anxiety to feel less tense. Thus, by adding positive design features, gaming companies can reduce the potential negative impact and construct a positive gaming environment.

5.2 Implementing Healthy Social Interactions and Community.

To add on, game companies, particularly those developing multi-player games should be aware of the impact of their game and create a community that is positive and enjoyable. As an example, they can implement systems such as reporting/moderation and community guidelines. By doing so, there is a clear set of rules that can be used to regulate the community, which will make it easier to develop a positive environment. Which has already been implemented by several big gaming companies. However, simply implementing rules will not be enough, developers must implement several different rules jointly in order to ensure a safe and positive social forum. One thing they can also do is to limit the age for different groups. For example, video games could limit the age gap for different groups, which, if posed correctly, can significantly reduce harassment of underaged individuals. Adding on, developers can also encourage positive interactions. For example, they can incentivize good behavior, including rewarding players who demonstrate positive behavior, such as helping others during community events. This can foster a culture of support and chivalry within the community. Thus, can lead to a positive social dynamic in the group.

5.3 Collaborating with Mental Health Professionals to Prioritize User Well-Being in Game Design

Besides incorporating beautiful design elements and promoting a healthy gaming environment, it is also important to work with professionals to ensure the development and maintain a healthy environment. They can be beneficial for a more scientific-based activity that can factually benefit the player. As an example, experts can help to find the right balance between a healthy environment, while remaining competitive and its profit. As an example, with the help of professionals, gaming companies can find the right amount of notification needed to encourage breaks

and find a balance between the amount of dopamine released to reduce possible addiction as much as possible.

6. Conclusion

This paper has delved into the intricate relationship between video games and individual psychological health, revealing the dual impacts on players' mental states. As a form of entertainment, video games have the potential to enhance cognitive abilities, increase satisfaction, and foster the establishment of social connections, particularly for individuals who may face challenges in traditional social contexts. However, the risks of excessive gaming, such as the potential for addiction and the exacerbation of mental health issues, cannot be overlooked. Additionally, a toxic gaming environment may undermine the psychological well-being of players. As the gaming industry continues to grow, it is imperative for game developers to recognize the profound influence their creations can have on the psychological health of players. To cultivate a positive and healthy online gaming environment, developers should take proactive measures, including but not limited to: integrating design elements that encourage healthy gaming practices, establishing and enforcing positive community guidelines, collaborating with mental health professionals, and continuously refining game content and interaction experiences.

Therefore, it is the collective responsibility of game developers, publishers, and the broader gaming community to acknowledge the significant impact their products can have on the psychological health of individuals. Developers must prioritize the well-being of their users and advocate for a healthier gaming social environment to facilitate the sustainable development of the gaming future for all.

References

- [1] Research and Markets. Global Online Gaming Industry Analysis Report 2024: A \$348.85 Billion Market by 2032 Featuring Activision Blizzard, Apple, Capcom, Electronic Arts, Microsoft, Nintendo, Sony, and Tencent. , Yahoo Finance. 2024,10.
- [2] GilPress. Whatsthebigdata.com website: <https://whatsthebigdata.com/number-of-gamers/>
- [3] What Makes Hyper Casual Game Development Popular in 2024? - Creative Digital Design & Development. Retrieved September 10, 2024, from Creative Digital Design & Development - Inventive Studio is majorly focused on Games Development, AR-VR and IOT solutions, Mobile Apps, Website Development and Other Software Solutions. website: <https://www.inventivestudio.co.uk/what-makes-hyper-casual-game-development-popular-in-2024/>
- [4] Cognitive Skills that Matter, How to Improve Them - Edublox Online Tutor. Retrieved September 10, 2024, from Edublox Online Tutor | Development, Reading, Writing, and Math Solutions website: <https://www.edubloxtutor.com/cognitive-skills/>
- [5] Cunningham, E. G., & C. Shawn Green. Cognitive Skills Acquired From Video Games. Oxford Research Encyclopedia of Communication, 2023 (1).
- [6] Video gaming may be associated with better cognitive performance in children. Retrieved September 10, 2024, from National Institutes of Health (NIH) website: <https://www.nih.gov/news-events/news-releases/video-gaming-may-be-associated-better-cognitive-performance-children>
- [7] Jones, C. M., Scholes, L., Johnson, D., Katsikitis, M., & Carras, M. C. Gaming well: links between videogames and flourishing mental health. *Frontiers in Psychology*, Article 260.
- [8] Alrahili, N., Alreefi, M., Alkhonain, I. M., Aldakhilallah, M., Alothaim, J., Alzahrani, A., & Baabbad, N. The Prevalence of Video Game Addiction and Its Relation to Anxiety, Depression, and Attention Deficit Hyperactivity Disorder (ADHD) in Children and Adolescents in Saudi Arabia: A Cross-Sectional Study. *Cureus*.
- [9] Video Game Addiction: What It Is, Symptoms & Treatment. Retrieved September 10, 2024, <https://my.clevelandclinic.org/health/diseases/23124-video-game-addiction>
- [10] Study: Video Game Addiction Prevalent in Young Adults with ADHD. Retrieved September 10, 2024, from ADDitude website: <https://www.additudemag.com/study-video-game-addiction-adhd-news/>
- [11] Naslund, J. A., Bondre, A., Torous, J., & Aschbrenner, K. A. Social Media and Mental Health: Benefits, Risks, and Opportunities for Research and Practice. *Journal of Technology in Behavioral Science*, 5(3), 245–257.
- [12] Cyberpsychology, Behavior, and Social Networking, 2021 Cyberpsychology, Behavior, and Social Networking website: <https://www.liebertpub.com/loi/cyber>