

# The Research on the Effects of Violent Video Games upon Chinese Teenagers' Memory

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**Abstract.** Currently, with the development of the Internet and the popularity of violent video games, there is a trend that parents are increasingly concerned about the negative effects caused by these games because most parents think the decline of memory is attributable to playing games. Meanwhile, the Chinese government promotes a regulation that adolescents whose age is under 18 should only play video games for one hour. If teenagers exceed that time limit, they will be punished and forced to pause gaming. Hence, society generally reaches an agreement that violent video games will be detrimental to youngsters both physically and psychologically. The goal of this research is to find out some positive influences violent video games can bring to adolescents' memory. This is of great importance on account of changing social stereotype towards violent video games and letting them realize these kinds of games can also enhance memory. Therefore, this study is conducted with a questionnaire, the quantitative research method. The object focused on teenagers aged between 12 to 18. By asking several questions such as the frequency of playing video games, their favorite type of game, and ways affect their students within a limited range, this research finally gets the answer that violent video games will not only not be harmful to their memories, but also improve their learning ability from three aspects.

**Keywords:** Violent video game; Teenager; Memory

## 1. Introduction

Currently, video games such as Action game, shooting game or Escape game seem more prevalent than before. The statistics show that from 2012 to 2022 first half years, the number of Chinese game users has increased from 410 million to 665.69 million, a huge growth in the last ten years [1]. China, the second largest economy, now has one of the largest amounts of game users in the world. These ten years are also the decade with the fast development of the Internet and digital information. Because of the advanced network infrastructure construction, the Internet has now nearly covered all the regions of China except some extremely poor areas or mountains that are unsuitable for installing net sets. CNNIC claimed that until June 2022, China's number of netizens had risen to 1.51 billion, and the availability rate has risen to 74.4% [2]. This report delivered by the Chinese government also reveals that till June 2022, the number of China's domain names has reached 33.80 million and almost all villages have broadband. This strong progress in network infrastructure underpins China's rapid growth of digital or video games. Consequently, the trend of the growth curve of networks is similarly to the increase curve of digital games. the development of the Internet in China supports China's whole game industry. The research shows China's total revenue of the video game industry: in 2008, the total income was 18.56 billion yuan; however, by 2021, the whole-year revenue reached an astounding data: 296.51 billion yuan [3], ten times growth in ten years.

Not only China has an obvious and saltant development in the video game industry, but America also shows this leap. According to the statistics of video game market revenue in the United States, there are only 25.34 billion dollars in 2017, but in 2022, the revenue leaped to 54.9 billion dollars, almost tripled [4]. The statistic also anticipates that in 2027, there will be a 75.39-billion-dollar market. Hence, the video game industry is now developing rapidly in the world.

Because of the prosperity of digital games, there is one type of video game that is very hot and cause increasing attention: violent video games. The statistics shows that 68% of The Top 50 best-selling games in 2012 contain violent content. In addition, Sarah, Aubrey and Chelsea claimed that

nearly 90 percent of video games now still in the market contain some violent content. In other words, almost all games now people can purchase in the formal channel have violent factors. Therefore, this high contact rate incentivizes heated discussion: whether the government should ban violent concepts or violent video games because people attribute various negative effects to this type of game such as the increment of crime rate, the distraction to teenagers' study performance or the harm to individuals' memory. China even wants to consider delivering a game classifying system because of the unique feeling of being immersed that result in mental change [5]. Doctor McCarthy, a professor from the University of Harvard, published a book about how to protect children from violent video games [6]. She found that children who were exposed to violent video games for a long time might be more aggressive than those who were never exposed [6]. More and more researchers or documentaries are currently keeping finding the negative effect generated by violent video games. For the last twenty years, politicians, scholars and media never stop discussing the relationship between playing violent digital games and forcible behavior [6]. Although people are widely looking forwards to the result of this argument, those focuses have not now been turned to adolescents on a large scale. There is also a previous research blank, which is nearly all the research focus on the whole or general effects produced by forcible digital games instead of specifically or merely studying the effect on memory from teenagers' perspective. Hence, this paper's theme is to find whether violent video games will be detrimental to teenagers' memory.

## 2. Literature Review

Researchers and scholars have developed a large number of studies of violent video games. For positive effect, for instance, by using WarVG-A to do data analysis and researching from various dimensions: personal attitude, theory, logic and cognition, etc., Del-Moral and Rodríguez-González found that the game of war was beneficial to develop people's critical thinking capacity towards the cruelty of the war [7]. In other words, digital games of war are simpler than other games for people to immerse into and realize the pain of wars, then gradually generate the model of critical thinking to wars. Pasqualotto, Parong, Green, and Bavelier found that in the recent twenty years, video games could strengthen the plasticity of individuals' brains and there was an increasing number of references emphasizing that digital games can be used as a tool to incentive the potential of people's brain [8]. Meanwhile, Weimin and Fei showed that nowadays, youngsters can show their personality, critical thinking and empathy through digital games by researching how young people play video games [9]. Khalid, Batool, Khalid, Saeed, and Zaidi conducted a survey of students aged 13 to 19 in Pakistani through interviews. This survey shows video games can generate a beneficial effect on students: improve their sociability and ability to solve problems, search for information and analyze data [10]. Finally, according to the study conducted by Agina and Tennyson, although violent video games might have some negative effects, such types of game can still help children adjust their thoughts and make them more willing to think deeply to express themselves, which successfully demonstrate the significance of embedding violence arousal into learning process [11]. Furthermore, lots of parents believe that digital games cause serious moral problems, let alone violent games. However, the researchers demonstrate virtual violent video games will awaken some people's positive emotional moral responses, which laterally proves that virtual violence can be seen as a moral behavior [12]. Nevertheless, there are also some studies that show the negative impact of violent digital games. Irak, Soyulu and Tümen found that excessive play of violent digital games is relevant to the deviation of people [13]. Simply put, long-term violent video game playing will jeopardize human memory. On the other hand, Maass, Kollhörster, Riediger, MacDonald and Lohaus use the controlled experiment of contrasting the different consequences of exposing violent and non-violent media concepts under the same condition to certify the short-term harmful effect on the memory produced by forcible digital games [14]. Hence, these researches show the diverse results produced by violent or non-violent video games, which can be generalized as cultivating the ability of critical thinking and empathy, stimulating potential or doing harm to people's memory system.

Although various individuals do research on the effects of video or digital games, fewer of them specifically study the positive impacts of violent video games. Moreover, a large amount of these researches use scientific methods to build model instead of surveying from students their own. Hence, this research will focus on the subjective thoughts of teenagers and use this research to attest violent games or video games have some positive effects rather than worthless or nothing is good and to transform the deep stereotype towards these games. This paper will use a questionnaire to investigate teenagers aged over 12 and below 18 and find out whether violent video games have a positive effect on adolescents' memory.

### 3. Methodology

This paper adopts a quantitative method based on the type of questionnaire to analyze the effects violent video games produced on teenagers' memory. The author made digital questionnaires both in Mandarin and English, then distribute those pieces to a middle school and a high school. The questionnaire was distributed on Oct.10th 2022 and taken back on Oct.15th 2022. The pre-request of answering this questionnaire is those whose exposure to video games is over 1 year and play video games for more than 1 hour per week. The standard of estimating the valid and invalid questionnaire is that those students who regard violent video games have positive effects. In the meantime, this research specifically focuses on type of violence, so those who choose their favorite type of game such as Puzzle games or Cultivation games will be judged as an invalid questionnaire. Those questionnaires are released in Wenjuanxing: a digital platform for distributing questionnaires and collecting data. Finally, 569 pieces are received and 84% (478 pieces) of them are valid.

### 4. Result

After receiving the questionnaire distributed to one senior high school and one high school, the author finally gets 569 pieces of answered questionnaire and by judging these pieces with the expected result, 478 pieces are valid. Initially, the author distributed those questionnaires to 1006 students, but almost 57.46% of them do not meet the pre-request of this research. Firstly, the teenagers whose exposure to mobile games are lower than 1 years will be deemed as invalid which takes up about 24.45%. Secondly, those who play video games for less an hour per week will be canceled, which lands 25.13%. Finally, for those who choose other types of game such as Puzzle or Cultivation will be judged as useless questionnaire. This takes up about 24.79%. The results show that 84% of participators subjectively think violent video games have positive effect to their memory, which are judged as the effective pieces. Meanwhile, almost 75 percent of them are over 15 years old and one third of them have exposed to online or mobile games for about 1 to 3 years. In addition, some plots in video games such as skill cooldown, respawn time and player skill are the best method they consider for practicing memory capacity, then 21.82 of them deem the progress of hidden missions. For those who find the negative impact of violent games, they also listed their reasons such as addiction. Therefore, this research demonstrates some characteristics of violent video games will improve teenagers' retention.

### 5. Discussion

As the result of the research shows, violent video games will not only be detrimental to adolescents' memory, but also enhance their memory. Currently, nearly all teenagers have access to use the Internet except for those in poverty and do not have a base station and net. For those students who participate in this research, almost 80 percent of them have been exposed to online games for at least 1 year and played violent video games for at least one hour. Furthermore, this percentage of using the Internet matches the Internet penetration in China, which is representative research.

There is a stereotype in China, that most of the Chinese parents consider video games as the devil that distract students' attention of study, weaken the capacity of memory and affect their mark, which

means online games do not have any benefits and all these types of the game are detrimental, let alone violent video games. The phenomenon can be attributed to parents in China only caring about the score their children get on the exam because they think their kids must work hard and the goal during their student time is to be first place and the highest mark. However, more and more students are now rebutting this kind of stereotype because they realize the advantages violent video games can give them. This is also the reason for the author to do this research: to investigate the advantage of violent online games from the perspective of teenagers.

The result is that 80% of adolescents deem forcible digital games will strengthen their memory. By analyzing the approach of how this type of game improves memory capacity, the author finds the player situation, progress of game missions and understanding of task settings are the top three.

For the first one, player situation, take League of Legends as an example. When users play this game, they should be tense and concentrate on the actual situation on the battlefield. As a result, because of the drastic batter and brutal culling system, they are supposed to remember all the states of opposite game players to better keep the leading edge or find an opportunity to turnover. Because of the set of diverse respawn times at different points of time, players should bear all sequences of respawn time in mind to perform better during a better form than being rebuked by teammates. However, the respawn time is just a micro aspect gamers need to keep in mind. The current player status, the ceaselessly changeable factor such as the equipment or economy of the opposite, should be conceived continually and bear in mind. There are also many other different aspects such as player skill, skill cooldown. All of these activities can train people's memory in a long term and keep the brain active.

Secondly, the hidden mission, the link players prefer most as a result of challengeable difficulty. This kind of mission requires multiple dimensions of individuals' capacity, but the core is still a memory. For instance, when playing a violent decoding game, there is usually various complex scenes players should analyze. During this process, remembering all the conditions players experience before and the tips this game gives is the crucial part for eventually decoding. The violent factors will also make them more intensive to keep remembering. If those game players forget some vital events or significant tips the system offer, it might waste quite a lot of time for them to infer or recall.

Thirdly, understanding of task setting, and the necessary condition for playing games, especially violent video games. When the system requires a player to read various plots to push for the process of the whole game, many users might skip those plots or ignore them. Nonetheless, when the game moves on to the next chapter, those users who neglect the texts may not understand the reason for the next step. Hence, when reading those tasks set, the combination of comprehension and retention counts most. For memory, those excellent players have a good memory to fast read and remember the texts when entering into the next plot. In contrast to those players with bad memory, it is hard for them to fast push forward the game.

Therefore, by merely analyzing the memory affected by violent video games from three sides, the advantage created by the details of the game is obvious. However, just because this research survey is from the perspective of teenagers, the disadvantages seem dimmer. It is widely accepted nearly all adolescents love playing games and a part of them even be addicted to violent video games on account of the stimulation and excitement. This is the main reason that students recognize as the negative effect. In addition, every participant in the survey wants to prove what they do is true and, as the pressure from parents, lots of them might fill in the questionnaire with the attitude of resisting parents, which can be called rebelling psychology, and even some of them lied to their results. Hence, many answers seem radical and although some of these are adjudged invalid, there are still some responses with emotions the author has not yet found. Maybe the result of this survey is too optimistic. That is to say, violent video games are not as beneficial as the questionnaire shows.

Nevertheless, the advantage of forcible digital games should be realized by people and also be proven by this survey. Here are some suggestions for those teenagers who play this type of game. On one hand, trying to limit the time of playing violent video games to avoid being addicted to the game. When being addictive to this kind of game, those adolescents will play that for the whole day without relaxing and it will inevitably exert negative influences on their psychology. On the other hand,

teenagers should follow the rule of the limitations of age. A large number of violent games in the market are too forcible that the regulation claims individuals whose age is over 18 are allowed to play those games. If teenagers touch this game ahead of time, their mentality might be distracted.

## 6. Conclusion

In conclusion, this paper has successfully found the positive effect generated by forcible mobile games on adolescents. The final received questionnaires, which is the main method of this research, are reviewed by the author. Whose exposure to video games is less than 1 year, whose amount of time of playing digital games is less than 1 hour and those who do not play violent video games are judged as invalid pieces that will not count in further research. In addition, this research combines with the currently prevalent trend – the Internet, and the data on the frequency of playing games is appropriately correspond to the popularizing rate of the network in China, which is the surprise point. As mentioned, parents' bad essentialism is a rebuttal of this research. This is also a chance for adolescents to communicate with their parents through this questionnaire. Many of them cannot play violent video games because their families ban that to make them better focus on their studies. Now, it is time to tell those parents: violent video games will not be detrimental to teenagers if playing appropriately. The paper analyzes the channels of how forcible video games help students enhance their memory capacity, that is the opposite situation, invisible missions and task setting. All these three aspects will help teenagers train their memory in a long term. However, this research also has some limited aspects. Those students who play violent video games for the whole night do not get sleep. This is a kind of addiction instead of something beneficial. For that kind of student, games are truly to be limited or even banned. To cover those events, they lie to the survey. It is crucial for students to normally play violent video games rather than play wantonly. In addition, just because of the stage of adolescent, they have the rebelling mental to protest their parents, then neglect those negative effects. Hence, this paper's outcome is a little bit subjective and it is better to do more objective studies to find out the percentage of those lied students. In future research, it is better to discover both positive and negative influences to get a more objective conclusion.

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