Research Article

From Gamers to Spectators: Exploring the Interplay Between Online Esports Viewership and the China Anti-Addiction System in Gaming

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Abstract: Video Gaming among minors can bring both enjoyment and concern. Gaming offers opportunities for entertainment, social interaction, and even skill development. However, excessive gaming among young people could lead to addiction resulting in issues like neglecting responsibilities, disrupted sleep patterns, and emotional disturbances. China has implemented the Anti-Addiction System to curb gaming addiction among minors which limits the amount of time minors can spend playing online games to promote healthier gaming habits and reduce the potential negative impacts of excessive gaming on their well-being. However, the effectiveness of China's anti-addiction system remains unknown. This study aims to examine the effectiveness of China's Anti-Addiction System in preventing gaming addiction among Chinese youths by assessing their game time in relation to online esports spectatorship. Using an online questionnaire, this study aims to assess the potential relationship between the effects of China's Anti-Addiction System and online esports spectatorship among Chinese youth between ages 15 and 17 (n = 33). Data were collected on participants' game time after restriction by China's Anti-Addiction System and their time spent watching esports online. Additional Likert scale questions further assessed the potential relationship. The collected data was subject to linear regression analysis and statistical hypothesis tests. This study discovered that there lacks convincing evidence of a relationship between the game time influenced by the Anti-Addiction System and online esports spectatorship. Results from this study reveal that China's Anti-Addiction System does not have a substantial influence on the online esports spectating behaviors of underage Chinese gamers. Continued research and observations in this area are necessary to develop more effective strategies for the prevention of gaming addiction among underaged gamers.

Keywords: Gaming; Anti-Addiction System; Gaming addiction; Chinese youth; Esports spectatorship.

Introduction

Since its implementation in 2021, the nationwide, real-name verified Anti-Addiction System has revolutionized the gaming realm for underage gamers in China. Replacing the sleepless nights of endless gaming, Chinese gamers under the age of 18 are now only allotted a regulated one-hour gaming window on Friday, Saturday, Sunday, and holiday evenings, from 8 pm to 9 pm. This restrictive policy, established by the Press and Publication Administration in China, aims to combat gaming addiction among Chinese minors [1]. Gaming addiction, or gaming disorder as defined by the World Health Organization, is an addictive behavior characterized by impaired control over gaming, prioritizing gaming over other activities to the point where it supersedes other interests and daily obligations, and persistently engaging in gaming despite experiencing adverse outcomes [2].

The number of underage gamers in China plummeted from 122 million in 2020 to 83 million in 2021 [3]. Several factors could have contributed to this sharp decline in the number of underage gamers, such as the regulatory measures established by China's Anti-Addiction System, encompassing a wide range of controls for gamers with requirements for real-name verification, as well as restrictions on game time for minors. The impact of this restrictive system has been nothing short of remarkable. According to data from the China Internet Network Information Center [4], there has been a 2.1% decline in underage computer gamers and a 3.2% drop in underage mobile game players from the previous year (56.4%), further highlighting the effectiveness of China's Anti-Addiction System in

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reducing gaming behaviors. Additionally, data from the 2022 Progress Report on the Protection of Minors in China's Game Industry demonstrated that more than 70% of minors played video games for less than 3 hours every week, and the total consumption of gaming among minors has also greatly reduced. This positive trend in stimulating healthier gaming behavior suggests a positive effect of the Anti-Addiction System in restricting game time among minors [5].

However, rather than abandoning their passion for gaming entirely, underage gamers have found an exciting alternative: immersing themselves in the world of esports. Many of them have shifted their interest from solely playing the games to watching professional gamers compete in intense tournaments since China lacks a mandatory nationwide real-name verification system prohibiting minors from watching esports live streams. Data from iiMedia reveals that 62.5% of livestream esports audiences in China are under 24 years of age, with nearly half of them being minors [6]. Among China's esports audience, 79.1% watch esports competitions for more than 10 hours on average per month in 2022 [7]. Given the limitations on game time, it is plausible that many underage gamers have shifted their interest from purely playing the games to watching professional gamers compete in intense tournaments through esports live streams as China lacks a nationwide system prohibiting minors from watching esports online.

In light of the constraints imposed by China's Anti-Addiction System and the burgeoning popularity of esports among Chinese underage gamers, this study aims to explore the potential relationship between the effects of the Anti-Addiction System and the prevalence of online esports spectatorship among underage Chinese gamers aged between 15 and 17.

Methods and Materials
Participant Recruitment

All participants were active online esports audiences between ages 15 and 17. Participants were recruited using non-probability convenience sampling from online communities related to esports on social media platforms to reach the target population (Chinese underage gamers). Social media platforms used include Weibo Super Topic communities, which are interest-based online discussion communities similar to "subreddits" on Reddit [8]. For instance, Super Topic communities of "Esports," "Esports fans," and Super Topic communities for popular esports competitions in China such as "LPL" (League of Legends Pro League), "KPL" (King Pro League), "IVL" (Identity V League) were used to recruit participants for this study. Likewise, Chinese social media platforms such as

Tieba, Douban, and Hupu were used for participant recruitment employing a similar approach.

The inclusion criteria for participants were as follows: (1) between the age of 15 to 17, (2) self-report being an active online audience of esports, (3) self-report that their game time is restricted by the Anti-Addiction System, (4) voluntary submission of the online questionnaire, and (5) signing the informed consent form authorizing the use of their information for research purposes.

Questionnaire and Survey

The following survey questionnaire was asked:
1. What is your gender?
2. Your age?
3. Is your game time limited by the Anti-Addiction System?
4. The average weekly game time is (hours)
5. The average weekly time spent watching live esports tournaments online is (hours)

The questionnaire was conducted on Wenjuanwang, a Chinese platform for professional online questionnaires. To measure the effectiveness of the Anti-Addiction System, participants who identified their game time as being restricted by the Anti-Addiction System were asked to self-report their average weekly game time. This metric serves as a direct indicator of how the Anti-Addiction System influences the participants' gaming duration. By collecting and analyzing this information, I aim to gain a comprehensive understanding of the effectiveness of the Anti-Addiction System in managing and moderating participants' game time. The participants were also asked to report their average weekly time spent watching esports online to determine if the Anti-Addiction System correlates with online esports spectatorship among underage gamers in China. Additionally, three additional supplemental Likert scale questions were included in the questionnaire to further explore the potential effect of the Anti-Addiction System on online esports spectatorship. These questions aimed to evaluate the participants' motivations for watching esports live streams in relation to the time restrictions imposed by the anti-addiction system.

The relationship between the game time restrictions set by the Anti-Addiction system and esports spectatorship was observed using simple linear regression analysis and hypothesis testing [9]. The collected data underwent simple linear regression analysis using Statistical Package for the Social Sciences (SPSS). Furthermore, to complement findings from the regression analysis, the mean values and standard deviations of participants' responses to the 7-

point Likert-scale questions were utilized as supplementary data. Cronbach's alpha test was conducted to assess the reliability of the Likert scale questions. The Cronbach's alpha coefficient was found to be 0.799 (p<.001), and alpha coefficients for all Likert-scale items were ≤ 0.70 (p<.001), indicating acceptable reliability [10].

Ethics
Ethics approval was obtained from the informal Institutional Review Board (IRB) at Cinco Ranch High School, Katy, Texas before recruitment began. To protect the confidentiality of the participants involved in this project, strict measures have been implemented to ensure the privacy and security of their information. Any information that can be used to identify the participants remained confidential, and all participants remained anonymous in the study. Each participant's response was assigned a unique code instead of using their real names. Data was collected between January and February 2023 using non-probabilistic convenience sampling due to the difficulty of carrying out a random sample. The study design and procedures were approved by the IRB to eliminate ethical issues.

Results
Demographics of the Participants
37 responses were collected between January and February 2023. Four responses were excluded from the 37 submissions as they did not meet the inclusion criteria. Demographic analysis indicates that males and females were roughly equally distributed (55% female and 45% male, **Table 1**).

Table 1. Sociodemographic Characteristics of Participants.

Baseline Characteristics	n	%
Gender		
Female	18	55%
Male	15	45%
Age		
15	7	21%
16	12	36%
17	14	42%

Relationship between the effect of the China Anti-Addiction System on game time and online esports spectatorship.
No correlation was found between the effect of the Anti-Addiction System on game time and online esports spectatorship. **Table 2** presents the results of the linear regression analysis (df = 31; t = 0.862; p > 0.05). As the significance level exceeds 0.05, I fail to reject Ho. There is insufficient evidence to support a relationship

between the effects of the Anti-Addiction System and online esports spectatorship among underaged gamers aged 15 to 17 in China. Consequently, no substantial relationship exists between game time affected by China's Anti-Addiction System and esports spectatorship.

Table 2. Linear Regression Analysis Results.

	Coefficient	Standard Error	t Stat	P-value
Intercept	3.1909	1.019877	3.1287	0.0038
Average weekly game time (hours)	0.1592	0.184716	0.8619	0.3953

Supplemental Questions
Beyond the absence of a correlation between respondents' game time and duration spent watching esports live streams, the responses to the supplementary Likert scale questions indicate an apparent lack of association between the effects of the Anti-Addiction System and online esports spectatorship. Among the three Likert scale questions, all displayed a mean score lower than 4.0 (i.e., the midpoint on the 7-point Likert scale), suggesting that most respondents did not perceive the restrictions on their game time as a contributing factor to their online esports viewership (**Supplementary Table 1**) [11]. However, it's noteworthy that the standard deviation values for each Likert scale question exceeded 2.0, indicating considerable deviations from individual responses concerning the mean value. This signifies a substantial degree of variability among participants' perspectives.

Conclusion
The objective of this study was to investigate whether a correlation exists between the time constraints imposed by the Anti-Addiction System and online esports spectatorship among Chinese youth of 15 to 17 years old. Evidence from this study does not provide compelling proof of any association between the Anti-Addiction System and online esports spectatorship. The supplementary results obtained from the Likert scale questions further reinforce the absence of a correlation, in which all three questions yielded a mean score below 4, implying a sense of neutrality or disagreement among participants regarding any

discernible correlation between the Anti-Addiction System and online esports viewership [12]. No statistically significant relationship exists between the Anti-Addiction System's impact on game time and online esports spectatorship among underaged Chinese gamers. However, the high standard deviation values of Likert scale question responses suggest a high variance among participants regarding any discernible effects of the Anti-Addiction System on their online esports viewership. This demonstrates that for some gamers, there is an alternative way for them to experience the cathexis of gaming and continue their passion for gaming through watching esports online. The results of this study present insight into Chinese minors' engagement in esports online in response to having strictly restricted game time. The lack of association opens discussions for policymakers and the gaming industry to possibly reassess the effectiveness of the Anti-Addiction System in preventing video game addiction. Besides, educators and parents may face the need to provide minors with more constructive and effective limitations and education to discourage addictive gaming disorders or excessive esports spectatorship.

This study has potential limits. First, the online survey utilized in this study relied on self-reported data, which is susceptible to response bias and social desirability bias [11]. Social desirability bias can lead respondents to present themselves in a more positive light, showcasing prosocial behaviors and overstating adherence to positively valued societal norms, even if their behaviors do not support such claims. Consequently, participants in this study may have underreported their game time and time spent watching esports or falsely indicated that their game time is restricted by the Anti-Addiction System, even if they were using an adult verified account. Response bias could also have been created with the use of inaccurate answers in the survey due to reluctance to report their honest answer. Furthermore, the non-probability convenience sampling method could have limited the generalizability of the findings and generated sampling bias. The sample in this study may not be fully representative of the population being studied. Additionally, due to physical distance constraints, we had limited access to participants. However, social media platforms were utilized for participant recruitment, ensuring an efficient data collection process despite the distance constraints. Lastly, as a preliminary study examining the hypothesized association between the effects of the Anti-Addiction System and online esports spectatorship, this study lacks prior research studies on this topic. Even though numerous preceding studies in China and across the world have explored gaming addiction and esports spectatorship on their own, respectively, there do not appear to be studies that scrutinized the effectiveness of the Anti-Addiction System in China limiting gaming addiction in terms of online esports viewership.

Although the sample size was sufficient to yield valuable results, future research could strengthen the robustness with a larger sample. To further assess whether there exists a potential association between the Anti-Addiction System and online esports viewership among underaged Chinese gamers, future research is advised to employ a larger sample in combination with multiple recruitment methods to reach a larger and more diverse sample, which facilitates incorporating more generalizability of the findings and more reliable statistical results. Beyond that, future research is advised to consolidate self-reported questionnaire data with actual screen time to conduct proper experiments, which could increase the robustness of research findings and reduce potential bias from self-reported data. Additionally, in the online setting, esports audiences' actual consumption data, such as hours watching esports and hours playing games alone, could be obtained with users' permission, giving policymakers and researchers more useful information and accessibility to target research participants and acquire more precise results. If policymakers and researchers hope to obtain a better understanding of whether the game time impacted by the Anti-Addiction System is associated with online esports spectatorship, then conducting more empirical research is crucial. Future research could, for instance, conduct observational studies or experiments that track game time and online esports consumption with ethical design to further investigate this. Finally, correlational studies can also be conducted to delve further into this topic.

Conflicts of interest

The author declares that there are no conflicts of interest.

References

1. Notice of the State Press and Publication Administration on Further Strict Management to Effectively Prevent Minors from Becoming Addicted to Online Games. www.gov.cn/zhengce/zhengceku/2021-09/01/content_5634661.htm (accessed on 2023-02-21)

2. World Health Organization. (2020, October 22). *Addictive behaviours: Gaming disorder*. https://www.who.int/news-room/questions-and-answers/item/addictive-behaviours-gaming-disorder (accessed on 2023-01-10)

3. China Youth Gamers. (2022, July). Niko Partners. Retrieved September 21, 2022, from https://nikopartners.com/china-youth-gamers/ (accessed on 2023-02-21)

4. Report of Internet usage of Chinese minors 2021 http://news.youth.cn/gn/202211/t20221130_14165457.htm (accessed on 2023-01-25)

5. Game Publishing Working Committee of China Audio-visual and Digital Publishing Association, China Game Industry Research Institute, Gamma Data, Progress Report on the Protection of Minors in China's Game Industry, 2022.

6. iiMedia Research. (2021). 2020-2021 China's e-sports live industry development special research report https://report.iimedia.cn/repo13-0/39370.html (accessed on 2023-01-20)

7. *iResearch. (2022)*. China Esports Industry Research Report 2022, https://report.iresearch.cn/report_pdf .aspx?id =4001(accessed on 2023-01-20)

8. Koetse, M., Verberg, G., & Xiao, B. (2022, March 3). What Are Weibo's "Super Topics"? What's on Weibo. https://www.whatsonweibo.com/what-are-weibos-super-topics/ (accessed on 2023-01-20)

9. Schneider, A., Hommel, G., & Blettner, M. (2010). Linear regression analysis: part 14 of a series on evaluation of scientific publications. *Deutsches Arzteblatt international*, *107*(44), 776–782.

10. Nunnally, J. C. (1978). Psychometric theory. New York, NY: McGraw-Hill.

11. Boone, H. N., & Boone, D. A. (2012). Analyzing Likert Data. *The Journal of Extension, 50*(2), Article 48. https://tigerprints.clemson.edu/joe/vol50/iss2/48 (accessed on 2023-01-20)

12. Brenner, P. S., & DeLamater, J. (2016). Lies, Damned Lies, and Survey Self-Reports? Identity as a Cause of Measurement Bias. *Social psychology quarterly*, *79*(4), 333–354.

Supplementary Table 1. Supplemental Questions. Descriptive statistics.

Item	Mean (SD)
I watch esports live streams because there are no time restrictions on watching esports, unlike the anti-addiction system.	3.72 (2.08)
I would not be watching esports live streams if my game time was not influenced by the anti-addiction system.	2.94 (2.18)
My time spent watching esports live streams has increased because of the anti-addiction system.	3.38 (2.14)