

What Affects Mobile Social Games Addiction During COVID-19: Taking Honor of Kings as An Example

Fan Yiting (1155131755), Gao Yifan (1155128246),

Cai Wenwen (1155128405), Zhu Xiaoxi (1155131658),

Chen Xiaoxiao (1155130149), Qi Xin (1155128611)

The Chinese University of Hong Kong

Abstract

Mobile social games are one kind of the favorite leisure online activities, especially under the special lockdown of COVID-19. The number of active players and the amount of time they spend on the game significantly raise with the risk of internet addiction. The authors take Honor of Kings, one of the most popular mobile social games in mainland China as an example to examine the relationship between players' psychological status and internet addiction during the epidemic period. Expanding the Uses and Gratifications Theory, a research model is developed to test three factors, including self-control, stress level, social interaction. The research model was tested with 124 responses from online participants. The results revealed that two factors – self-control, social interaction significantly influenced internet addiction and stress level does not show any significant influence. Practical implications and theoretical contributions of the study findings are discussed in the context of lockdown and recovery.

1. Introduction

1.1 Popularity

The Honor of Kings is a popular mobile social game in China owned by internet giant Tencent. As a MOBA (Multiplayer Online Battle Arena) and a Multiplayer Online Competitive Mobile Social Game, it has over 200 million registered users till now, and a maximum of 50 million daily active users according to consulting agencies.

Nowadays, the penetration rate of Honor of Kings is about 22.3%, with those under 24 accounting for 52%.

With the development of communication technology in recent years, the cost of network communication falls further, it makes people break through the barrier of network game's dependence on Wi-Fi signal. Besides, it indirectly indicates that mobile social game users can play almost everywhere for relaxation.

According to statistics, the Honor of Kings' peak DAU had reached 80 million, it can be said that the Honor of Kings has become one of the most important parts of young people's entertainment life.

1.2 Social platform

The Honor of Kings not only satisfies users' entertainment needs but also provides a social platform and content for users, which can effectively relieve users' pressure in life and work. According to our survey in Technology Update paper, many gamers

socialize with their playmates through in-game buddy systems and in-game voice chat systems.

1.3 Psychological problems caused by COVID-19

At the beginning of 2020, the COVID-19 epidemic outbreaks, home epidemic prevention has become one of the keywords of Chinese people in the New Year. As a result, offline entertainment activities are subject to a wide range of restrictions, and the frequency of users choosing online social contact and entertainment gradually increases, leading to the steady growth of an online business.

About 35 percent of the respondents suffered from psychological distress and had obvious emotional stress reactions, of which 29.29% suffered mild to moderate distress and 5.14 percent suffered severe psychological distress. (Xu Yifeng, 2019) Playing games is exactly a way for people to relieve their psychological pressure.

1.4 Online social needs caused by COVID-19

For young people, the long-term home epidemic prevention has compressed their offline social needs, the pent-up psychological emotions of the epidemic need a release window, online social games can meet the requirements.

According to the data collected from China Mobile Internet Database, the time people spend online has increased significantly during the outbreak of COVID-19. When people have more time staying at home, they tend to spend more time on entertaining

apps such as Honor of Kings, which has experienced an increase of 36% in daily active users, which reached to 95,000,000 users per day.

More specifically, the average time people spend playing Honor of Kings has increased from less than 2 hours to more than 3 hours, an increase of 75%, during their household epidemic prevention.

1.5 The issue of game addiction

However, if people are addicted to social network for a long time, they will have a strong sense of dependence and infatuation on the media network, and even get stuck in the media world, confusing the nature of the real world and the virtual network, and gradually become the "slave" of media science and generates narcissism, paranoia, depression, indifference, procrastination, and other adverse psychological phenomena, inducing psychological diseases.

In the research, we are going to dig out the causation of the Honor of Kings' addiction and find some methods or suggestions to overcome it.

2. Literature review and Research Questions

2.1 Use and Gratification

As defined by Louis Leung in his article that addiction is based on the medical model and is properly reserved for bodily and psychological dependence on a physical substance but not a behavior pattern (Leung, 2014). From the perspective of his eight

symphonies, we can clarify why the COVID-19 drives the addiction, as the virus brings problems of time management and environmental distress for people.

However, the perspective that we want to focus on here is the U&G theory. The honor of Kings as a mobile game, it can be applied by the *Use and Gratification* theory, as it can feed people's social and psychological demands.

Firstly, the users are all active audiences, the perceived fulfillment through using Honor of Kings in the psychological aspect is entertainment or leisure. On the social needs side is to get a new partner and team-work spirit. But with the long-term gratification-obtained, there derived the dependency theory, which means the long time U&G affects, the deeper dependency the audience will have on media, and the negative evolution of dependency will become Internet addiction.

2.2 Internet Addiction

As the game is designed to form a group and to fight the enemy by the virtual ability, it enables people to release their emotions by acting the virtual function and learn how to negotiate a strategic team to win.

As states in Louis Leung's article that "Massively multiplayer online role-playing game can be very addictive as adolescents can role-play a character, immerse themselves in a fantasy world, and become well-known in online games"(frosting-Henningson,2009; Smahel, Blinka, &Ledabyl, 2008). That is to say, compared to other simple games, players can get higher order of social-psychological needs from Honor of Kings rather

than just website browsing or killing time, they can obtain demands such as status-gaining, expressing an opinion, identity-experimentation, and entertainment.

As we can see from the game design, this virtual community offers unpredictability and curiosity, epic meaning and calling, development and accomplishment, empowerment of creativity and feedback, the embodiment of heroism, etc.

From Leung's analysis of the user data survey that "Such results indicate that adolescents who scored highly in entertainment and status-gaining gratifications at Time 1 might be most likely to develop pathological Internet use and exhibit addiction symptoms one year later"(Leung, 2014). therefore, the higher order of the gratification that people can get from the function design of Honor of King resulted in the addiction.

Additionally, another physical characteristic of Honor of Kings is mobility as it is a mobile game, according to Leung that affordances such as mobility and ubiquity of the game devices, like iPhone and iPad, can also be the accelerate factor of addiction rate (Leung, 2014).

Chen et al also developed scales for Chinese Internet Addiction Core Symptoms, measuring internet addiction from tolerance symptoms, compulsion and withdrawal symptoms, interpersonal and health-related symptoms and time management problems (2003).

2.3 Self-Control

Self-control directly affected internet addiction (Kim et al, 2017). Generally, individuals with low self-control have a higher chance of experiencing problematic behaviors, such as internet and game addiction, than those with high self-control (Gottfredson & Hirschi, 1990; Tangney et al., 2004). During the lockdown, players had no access to any outdoor activities and were forced to stay at home with an environment of less stress and competition, more free time, and comfortable space. However, psychological risk factors for substance use may vary across the social environment and the context of the environment is likely to affect people's level of self-control (Novak, & Clayton, 2001). Therefore, we predicted that during the lockdown, people's self-control is influenced because of changes in the environment, which causes significant fluctuations in the average time spent on the Honor of Kings and finally leads to addiction. And our first research question and hypothesis are:

RQ1: *Does self-control affect Honor of King's addiction?*

H1: *Self-control will negatively affect the Honor of Kings' addiction.*

2.4 Stress Level

According to Xu Yifeng, President of the psychiatrist branch of the Chinese medical doctor's association, about 35 percent of the respondents suffered from psychological distress and had obvious emotional stress reactions, of which 29.29% suffered mild to moderate distress and 5.14 percent suffered severe psychological distress. Playing games is exactly a way for people to relieve their psychological pressure (Xu Yifeng 2020).

Stress and internet addiction are connected. Broad internet addiction and stress programs should be provided to prevent problems of internet addiction(Kim et al, 2010).

We predicted that during the lockdown period, people's stress level raised and therefore they spend more time playing Honor of Kings. Our second research question is:

RQ2: Does stress level affect Honor of Kings addiction?

H2: Stress level will positively affect Honor of Kings addition.

2.5 Social Interaction

According to users' daily feedback, the Honor of Kings, as a mobile social game, can not only meet users' entertainment needs but also provide online voice, game social system, and other functions to serve users' social needs. (Shi Haosheng, 2015)

Individual gratification, a second-order factor reflected in interaction with others, is a strong determinant of users' intention to play mobile social games (Wei & Lu, 2014).

People get more engaged in social games for the purpose of social interaction (Hou,2011). During the COVID-19 period, people are forced to stay at home and separated from others, leading to greater needs for social interactions online instead of face-to-face interactions. Interactions with others in mobile social games like Honor of Kings can fulfill the need.

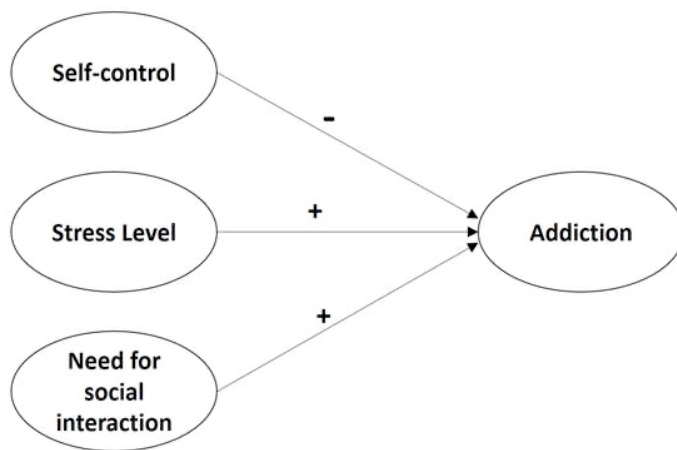
RQ3: Does need for social interaction affect the Honor of Kings addition?

H3: Need for social interaction will positively affect Honor of Kings addition.

3 Methodology

This research paper is intended to find out the causes of addiction to internet during COVID-19, and mobile social game Honor of Kings is used as a starting point.

Regarding the questions raised in the last part, we chose a quantitative method to do the research for the reasons that we want to evaluate the impact of self-control, stress level, and social interaction desire on the addiction level of Honor of Kings. After the literature review, we picked up 4-6 questions for each topic.



(Figure 3.1 Impact Model)

A questionnaire survey with 11 questions was used to collect data. The second, third, and fourth questions explore the relationship between self-control, stress, and social interaction desire and Honor of Kings addiction respectively. These three questions contain 5-6 sub-questions to further investigate the impact of each factor. For example, in the “social interaction” part, the sub-questions are:

1. During COVID-19 household epidemic prevention, my social desire is stronger than usual.
2. During COVID-19, I cannot socialize with my friends offline, Honor of Kings could help maintain friend intimacy, so I spend more time playing Honor of Kings.
3. Honor of Kings often become the conversation topic between me and my friends, so I spend more time playing Honor of Kings.
4. During COVID-19, socializing in Honor of Kings could reduce my longlines in real life.

Questionnaire data were collected from April 11th to 12th by online questionnaire platform Wenjuanxing. Target respondents are individuals who play the game Honor of Kings while our sample is defined as ‘individuals who play the game Honor of Kings in the friend circle of our group members and friend's friends. Two sampling methods are:

1. Convenience sampling: posting the questionnaire on social media such as WeChat (especially WeChat groups that have more of our target respondents such as the game group of Honor of Kings) and Weibo and invite friends to help fill out the questionnaire.
2. Snowball sampling: ask our friends to post the questionnaire on their WeChat groups and Moment.

Internet addiction measurement is based on Chen, Weng et al's Chinese Internet addiction scale (2003). There are three parts for evaluation including Sym-C(compulsive internet use), Sym-W(withdrawal from internet addiction), and Sym-T(tolerance of internet addiction). We designed two questions for each part, using six perspectives totally to measure the degree of internet addiction. Questions related to the three factors in our hypothesis, namely self-control, stress level, and social interaction desire, are designed by referring to several theses and reports.

The self-control scale is localized based on Low Self-Control Items and Results of Principal-Components Analyses (Arneklev, Bruce, et al, 1993). The dimensions are simplified to fewer questions (one statement for measurement each dimension) but the six perspectives are kept: impulsivity, simple tasks, entertaining activities, risk-seeking, entertaining activities, self-centered, and temper components. Both the current situation and the research topic are considered in the process: physical activities component is adjusted to entertaining activities because of the special situation that people spend most of their time online and telling physical from mental activities is not applicable. Therefore, we tried to divide this dimension into two perspectives: entertaining and thinking activities.

The social interaction desire scale is designed based on the questionnaire investigating the influence of mobile game users' willingness to pay (Dou Jingjing, 2018). In this research, 'love and belonging needs' and 'emotional demand' of users are quantified to

evaluate their impacts on game users' willingness to pay. According to this logic, we redesigned the questions by exchanging the keywords.

We chose a suitable methodology to give a bigger and more concrete picture of the questionnaire result. Thus, the quantitative approach and statistical analysis such as using SPSS to do correlation analysis and reliability testing are used to make analysis and generalization to verify whether our hypotheses are correct or not.

4 Findings

Correlation analysis was conducted to study the correlation between the three items and the degree of addiction to the Honor of Kings during the epidemic period. During the analysis, the Pearson correlation coefficient was used to indicate the strength of the correlation. The following tables indicate the correlation among self-control, stress level, need for social interaction, and the addiction of Honor of Kings.

4.1 Self-control

The first one is about self-control and the addiction of Honor of Kings. The components of IV, that is self-control measurement perspectives, is on the first line while the six metrics of Honor of Kings addiction are on the first row.

These tables show that there is a positive correlation between the impulsivity component and the six metrics on Honor of Kings addiction measurement. And the correlation coefficient values are 0.463, 0.438, 0.415, 0.536, 0.582, 0.580. Under the same six metrics, simple tasks component (0.335, 0.304, 0.299, 0.353, 0.446, 0.535)

and risk-seeking component (0.437, 0.334, 0.326, 0.409, 0.489, 0.571) shows less positive correlation. Entertaining activities component and self-centered component has more positive correlation with the values of 0.603, 0.636, 0.614, 0.616, 0.676, 0.460 and 0.617, 0.599, 0.568, 0.543, 0.567, 0.464 separately. As for temper component, the values of Sym-C and Sym-W and Sym-T1 are 0.292, 0.300, 0.449, 0.310, 0.406, which are positive with the exception of Sym-T2.

More specifically, the bolded data are the most significant data, and the Italic and shadowed data was little or no significant. Actually, most data are reliable with the exception of temper component and Sym-C1.

We can draw to the conclusion that in general, there is a significant correlation between self-control and the degree of addiction to the Honor of Kings. And in the questionnaire, the lower self-control level is, the higher score the participant got. Therefore, self-control negatively affects the Honor of Kings addition.

	Impulsivity Component	Simple Tasks Component	Risk-seeking Component	Entertaining Activities Component	Self-Centere d Component	Temper Component
Sym-C1	0.463**	0.335*	0.437**	0.603**	0.617**	0.265
Sym-C2	0.438**	0.304*	0.334*	0.636**	0.599**	0.292*
Sym-W1	0.415**	0.299*	0.326*	0.614**	0.568**	0.300*
Sym-W2	0.536**	0.353*	0.409**	0.616**	0.543**	0.449**
Sym-T1	0.582**	0.446**	0.489**	0.676**	0.567**	0.310*
Sym-T2	0.580**	0.535**	0.571**	0.460**	0.464**	0.406**

(Table 4.1 Self-control and Honor of Kings Addiction)

4.2 Stress level

The second table is on the stress levels. According to the situation analysis in the table, correlation analysis is conducted to study the correlation between the psychological stress index of users and the degree of addiction to the Honor of Kings during the epidemic period. During the analysis, the Pearson correlation coefficient was used to indicate the strength of the correlation.

According to the systematic analysis of SPSS, the correlation values of the psychological stress index and the six indicators of addiction to the Honor of Kings were 0.159, 0.194, 0.181, 0.237, 0.256, and 0.045, all of which were close to 0. All p values were greater than 0.05, indicating high reliability.

All significant correlation values are bolded which are relatively low compared to these numbers in self-control, indicating that the correlation is not as significant as those in self-control. Those left in white are the ones with no significant correlation at all.

However, it is also noticeable that most of the data are not reliable enough with a p-value above 0.05, in the table that is there is no * mark.

The subjective emotion shows a significant correlation with the Honor of Kings addiction. But if all the metrics are considered, in general, there is no significant correlation between the psychological stress level of users and the degree of addiction to the Honor of Kings in our research. In our research, the stress level does not affect the Honor of Kings addiction.

Therefore, there is no significant correlation between the psychological stress index of users and the degree of addiction to Honor of Kings.

	Frustration	Control	Nervousness	Future expectation	Subjective emotion
Sym-C1	0.181	0.181	0.22	0.079	0.319*
Sym-C2	0.159	0.144	0.185	0.138	0.349*
Sym-W1	0.194	0.159	0.174	0.192	0.354*
Sym-W2	0.237	0.242	0.307*	0.295*	0.394**
Sym-T1	0.256	0.275	0.26	0.212	0.395**
Sym-T2	0.045	0.126	0.185	0.209	0.408**

(Table 4.2 Self-control and Honor of Kings Addiction)

4.3 Social interaction

The final table is about the need for social interaction. The correlation values of social desire during the COVID-19 period index and the six indicators of addiction to Honor of Kings were 0.016, 0.108, 0.262, 0.252, 0.231, 0.112, all of which were close to 0. All p values were greater than 0.05, indicating high reliability. There is no significant correlation between the social desire index of users and the degree of addiction to the Honor of Kings.

The bolded data are the most significant data and the Italic and shadowed data was little or no significant. Those left in white are also significant. As the table shows, friend intimacy, conversation topic, loneliness generally has a significant correlation with the Honor of Kings addiction with the exception of social desire. There is a significant correlation between some aspects of the need for social interaction and Honor of Kings addiction with the exception. In the research, needs for social interaction may positively affect the Honor of Kings addiction to some degree. But there is no solid conclusion.

	Social desire	Friend intimacy	Conversation topic	Loneliness
Sym-C 1	<i>0.016</i>	0.476**	0.398**	<i>0.252</i>
Sym-C 2	<i>0.108</i>	0.494**	0.423**	0.342*
Sym-W 1	<i>0.262</i>	0.571**	0.460**	0.399**
Sym-W 2	<i>0.252</i>	0.482**	0.346*	0.384**
Sym-T 1	<i>0.231</i>	0.612**	0.412**	0.357*
Sym-T 2	<i>0.112</i>	0.358*	<i>0.048</i>	0.359*

(Table 4.3 Self-control and Honor of Kings Addiction)

5 Conclusion and Discussion

Our research shows that Honor of Kings addiction is associated with different levels of self-control, stress, and social interaction. This has to do with the user needs that the game itself satisfies. Under these conditions, COVID-19 has more significant characteristics and data performance in a special time period.

First, the research shows that self-control can have a negative impact on the Honor of Kings. From this, we can infer that during the epidemic, people with poor self-control may use the Honor of Kings for a much longer time than usual. Its leisure time for a certain degree of dependence on mobile games is also very sure. This is also consistent with Kim, j. 's view of "self-control directly affected Internet addiction" (Kim et al, 2017). Interestingly, we found no significant correlation between stress levels and the Honor of Kings addiction. Games may indeed be a way for people to relieve psychological pressure, as Xu Yifeng said (2020). However, it is not true that during an epidemic, people may become more obsessed with the Honor of Kings in order to relieve excessive psychological stress. People may resort to other ways to relieve stress, such as working out at home.

Prolonged home life during an outbreak is bound to increase the need for social interaction. Compared with the surprising results of the psychological stress study, the role of social interaction in the Honor of Kings addiction is clear. Based on the collected data, we can see that the Honor of Kings, as a game, largely satisfies people's need to increase the intimacy of friends through game mode and social function. As

well as the positive correlation between multiple components of social interaction and the Honor of Kings addiction during the epidemic with the exception of social desire.

Actually, in others' research on the intention to play mobile social games or the cause of game addiction, researchers' results and conclusions are quite different. Some consider social interactivity as significant factors while others find there is no connection between social interaction and intention to play mobile social games at all. In view of this study, we can say that need for social interaction may positively affect the Honor of Kings addiction to some degree. In short, the main reason for the addiction to the Honor of Kings is still a lack of self-control.

Limitations and suggestions for future research

Furthermore, we hope that people who are addicted to mobile games will realize the seriousness of this problem and refuse to indulge in it, so as to have a more positive psychological and life state. Know how to relieve psychological pressure and meet social needs through positive channels, especially improve self-control, do not disturb the normal rhythm of life because of the outbreak, and as soon as possible after the outbreak into normal work and learning. Of course, the research method of this study is relatively simple (questionnaire survey), and the research results are not universal for the phenomena and effects during the epidemic. No consideration was given to the influence of three factors on mobile game addiction and the influence of three factors on each other. There is also no in-depth discussion on the impact of offline life content on online and offline social entertainment. In the future, experimental or

quasi-experimental design with relatively strict control conditions can be adopted, and longitudinal study or follow-up study can be considered.

6 References

- [1]石浩生. (2015). 媒体接触与社交依赖. 新闻研究导刊, (23), 135.
- [2]Wei, P., & Lu, H. (2014). Why do people play mobile social games? an examination of network externalities and of uses and gratifications. *Internet Research*, 24(3), 313-331.
- [3]Hou, J. (2011), "Uses and gratification of social games: blending social networking and gameplay", *First Monday Peer-Reviewed Journal on the Internet*, Vol. 16 No. 7.
- [4]Gottfredson, M. R., & Hirschi, T. (1990). *A general theory of crime*. Stanford, CA: Stanford University Press.
- [5]Tangney, J. P., Baumeister, R. F., & Boone, A. L. (2004). High self-control predicts good adjustment, better grades, and interpersonal success. *Journal of Personality*, 72(2), 271–324. doi:10.1111/j.0022-3506.2004.00263.
- [6]Kim, J., Hong, H., Lee, J., & Hyun, M. (2017). Effects of time perspective and self-control on procrastination and Internet addiction, *Journal of Behavioral Addictions* J Behav Addict, 6(2), 229-236. Retrieved Apr 14, 2020, from <https://akjournals.com/view/journals/2006/6/2/article-p229.xml>
- [7] Arneklev, Bruce, J. Grasmick, Harold Tittle, and G. Bursik. "Low Self-control and

Imprudent Behavior." *Journal of Quantitative Criminology* 9.3 (1993): 225-47. Web.

[8] Chen, S. H., Weng, L. J., Su, Y. J., Wu, H. M., & Yang, P. F. (2003).

Development of a Chinese Internet addiction scale and its psychometric study.

Chinese Journal of Psychology.

[9] Li, Caina, Dang, Jianning, Zhang, Xiaoling, Zhang, Qianqian, and Guo, Jingjing.

"Internet Addiction among Chinese Adolescents: The Effect of Parental Behavior and Self-control." *Computers in Human Behavior* 41 (2014): 1-7. Web.

[10]Cohen, S.; Kamarck, T.; Mermelstein, R. A global measure of perceived stress. *J. Health Soc. Behav.* 1983, 24, 385-396

[11]窦晶晶. (2017). 手机游戏用户付费意愿的影响因素研究 (Master's thesis, 西安理工大学).

[12]Erturkoglu, Z., Zhang, J., & Mao, E. (2015). Pressing the Play Button: What Drives the Intention to Play Social Mobile Games? *International Journal of E-Business Research (IJEBR)*, 11(3), 54-71.

[13]Leung, L. (2009). User-generated content on the internet: An examination of gratifications, civic engagement and psychological empowerment. *New Media & Society*, 11(8), 1327-1347.

[14]Wei, P., & Lu, H. (2014). Why do people play mobile social games? An examination of network externalities and of uses and gratifications. *Internet Research*,

24(3), 313-331.

[15] Leung, L. (2008). LINKING PSYCHOLOGICAL ATTRIBUTES TO ADDICTION AND IMPROPER USE OF THE MOBILE PHONE AMONG ADOLESCENTS IN HONG KONG. *Journal of Children and Media*, 2(2), 93-113.

[16] Novak, S. P., & Clayton, R. R. (2001). The influence of school environment and self-regulation on transitions between stages of cigarette smoking: A multilevel analysis. *Health Psychology*, 20(3), 196.

[17] Kim, H. S., Choi, Y. H., & Yoo, S. J. (2010). The study on the relations among ego-identity, stress, and internet addiction in high school students. *Journal of Korean Academy of Psychiatric and Mental Health Nursing*, 19(2), 173-185.

[18] Leung, L. (2014). Predicting Internet risks: a longitudinal panel study of gratifications-sought, Internet addiction symptoms, and social media use among children and adolescents. *Health Psychology and Behavioral Medicine: An Open Access Journal*, 2(1), 424-439.

7 Bibliography

[1] 杨修成. (2012). SNS 网络游戏上瘾机制及其影响因素的探究. *中国经贸*, (8), 144-146.

[2] 肖玲玲, & 石向实. (2012). 大学生网络成瘾倾向与生活事件、自我效能感的关系研究.

- [3] 李毛毛. (2019). 社交类手游对大学生人际交往的影响——以《王者荣耀》为例. 大众文艺, (9), 262.
- [4] 廖曼孜. (2019). 浅析中国手游市场的现状与未来发展趋势. 市场观察, (2), 84.
- [5] 崔曦曦,孙晓军,牛更枫. (2016) 社交网站中的自我呈现对青少年友谊质量的影响:积极反馈的中介作用[J].心理发展与教育,32(03):294-300.
- [6] 张自中,彭兰. (2018). AR 情景下的游戏玩家线下化身认同及其模式研究[J].新闻界,(06):64-72+100.
- [7] Mroczek, D., & Kolarz, C. (1998). The Effect of Age on Positive and Negative Affect: A Developmental Perspective on Happiness. *Journal of Personality and Social Psychology*, 75(5), 1333-1349.
- [8] Pedro Campos. (2017). The Impact of Gamified Social-Media Mobile Challenges on Mental Well-being. *EAI Endorsed Transactions on Serious Games*, 4(13), 1-6.