Mobile Phone Use，Mobile Phone Addiction and Academic Performance in Primary School Students

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Abstract: *In order to explore the relationship among mobile phone use，mobile phone addiction and academic performance of primary school students, 187 Chinese primary school students were surveyed on mobile phone use, mobile phone addiction and academic performance. The results showed that 38.7% of primary school students had their own mobile phone. 41.3% of the students with mobile phones asked for mobile phones on their own initiative, and the rest were given a mobile phone by their parents or elders. 12.6% of primary school students use mobile phones for more than one hour a day and 24.5% use mobile phones for more than half an hour a day. From high to low, the top three ways primary school students use their phones are networking, information search and phone calls. About 16% primary school students have the tendency of mobile phone dependence; there is no significant difference of grade, gender and one-childin mobile phone dependence. There was a positive correlation between cell phone use time and cell phone dependence.Pupils' academic performance was at an upper level.There was a significant negative correlation between MPA and academic performance.*

Keywords*: mobile phone usage, mobile phone addiction, academic achievement, primary school student*

I. **Introduction**

With the continuous development of the Internet and the popularity of smart phones, using mobile phones to surf the Internet has become an important part of people's lives.By June 2019, the number of mobile Internet users in China had reached 847 million, an increase of 29.84 million over the end of 2018.Among them, students use mobile phones on a large scale.HuiQiuping's survey showed that 64.36% of primary and middle school students have their own mobile phones (2013).Che foundation published a survey report on the use of mobile phones by students in Taiwan in June 2006, which showed that nearly 70% of students have mobile phone dependence (Shao Leilei, Lin Heng, 2010).The same is true abroad, where 40% of Spanish teenagers are addicted to their phones, spending more than four hours a day talking or texting (2014).75% of college students in South Korea believe that mobile phones are a necessity in life, and if they are not around, they will feel anxious, in bad mood and slow in

thinking, presenting "mobile phone poisoning syndrome" (Ye Xindong, 2004).

According to the blue book on youth -- report on the Internet use and reading practice of Chinese minors (2017-2018) released by the Chinese academy of social sciences, 64.2 % of primary school students have their own mobile phones. From 2006 to 2017, the age at which Chinese minors first came into contact with the Internet has been decreasing, and by the end of 2017, the proportion of 7-year-olds (preschool age) who were connected to the Internet had reached 27.9% (Wang Hongxia, 2018).Mobile phone addiction gradually shows the characteristics of a younger age.And because the resistance of primary school students is weaker than that of adults, when using mobile phones, the body absorbs more radiation than adults.Therefore, the radiation from mobile phones will damage the brain nerves of primary school students, causing headache, memory loss and sleep disorders (He Xuehuan, Zhang Zhihua, 2018).Zhao Yuru (2016) found that the higher the level of self-control, the lower the degree of dependence on mobile phones.Compared with adults, primary school students have lower self-control, so they are more likely to give in to the temptation of mobile phones and thus more likely to become dependent on them.At present, many developers of mobile applications focus on minors and even primary school students, developing a lot of software and applications with primary school students as the main audience.Some schools and educational institutions have also incorporated technology into their teaching, requiring pupils to be equipped with devices such as ipads and mobile phones for use in the classroom.In this way, the degree of mobile phone use and dependence on the students' learning life will have a certain impact.

In a word, the problem of mobile phone addiction is becoming more and more serious, and its negative effects are also increasing.It is urgent to study the negative effects and interventions of mobile phone addiction.This paper will explore the current situation of primary school students' mobile phone addiction and its impact on academic performance.

1.1 Mobile phone addiction

Mobile phone dependence, also known as mobile phone addiction, refers to an obsessive state in which individuals' physical, psychological, and social functions are significantly impaired due to the use of mobile phones. Many scholars believe that mobile phone dependence is an impulsive behavior with withdrawal symptoms (Gou Yongkuo, 2016), and it is a "behavioral addiction" (Shao Leilei, Lin Heng, 2010), that is, mobile phone dependence is excessive. Addicted to mobile phones, the addictive behavior may not involve any specific direct biological effects, but refers to an unusual behavior mode, which causes individuals to suffer pain or significantly affect their physical, mental health, and occupation due to repeated activities in these activities Function or social interaction (XuHua, Wu Xuanna et al.,2008).

1.2 Academic performance of primary school students

Academic achievement refers to the achievement of learning, harvest. Academic performance is mainly related to rewards and punishments, compliance with discipline, parental expectations, counselling and the degree of cover-up (Wan Xingsong and FeiLongcai, 2003). Li Mingmin and Pan Xiaoli (2000) et al. found that changes in modern lifestyles have an impact on academic performance. Quite a few boys are addicted to playing video games and stay in the Internet bar for a long time, which leads to inattention in class or drowsiness. Therefore, compared

with girls, boys tend to be more anxious about learning, and the phenomenon of avoiding study and exams is more serious, so their academic performance is worse than that of girls. Besides, academic performance is also related to students' psychological factors. Depression, anxiety and self-esteem are important factors affecting academic performance. Learners without depression, anxiety and high self-esteem perform better (ZengRong, 2018).

1.3 Primary school students' mobile addiction and academic performance

Mobile phone dependence is one of the hotspots in today's society. Research shows that mobile phone dependence has become one of the reasons for the continuous decline in the physical health of primary school students in China (He Xuehuan, Zhang Zhihua, 2018). A three-year longitudinal study of 1,877 adolescents in South Korea found that there is a two-way relationship between mobile phone addiction and depression, and the two will promote each other to cause a vicious cycle (Sangmin Jun, 2016). Research on medical students has shown that mobile phone addiction can reduce students' self-control ability, which in turn can cause or exacerbate academic burnout (Zhang Bing, 2019).

Many domestic researches on mobile phone dependence have taken junior, high school, and college students as research objects, and in the existing research. There are few studies that directly examine the relationship between the two variables of mobile phone dependence and academic performance. Therefore, the author attempts to study the relationship between the degree of mobile phone dependence and academic performance of primary school students from the perspective of primary school students. The purpose of this study is to investigate the use of mobile phones by primary school students, including whether primary school students have a mobile phone, their daily use of mobile phones, and their use, and to explore the relationship between the current status of school mobile phone dependence and academic performance.

II. Method

2.1 Participants

187 primary school students were tested. Among them there are 84 males and 103 females and all of their ages are between 9 and 12. 41.7% of them are only child and 58.3% are non-only child. They come from different grades. The specific conditions of the participants are shown in Table 1.

Table 1. Participants.

		n	%
Gender	Male	84	44.9%

	Female	103	55.1%
Grade	Fourth grade	63	33.7%
	Fifth grade	77	41.2%
	Sixth grade	47	25.1%
Whether or	Only child	78	41.7%
not the only	Non-only child	109	58.3%

2.2 Instruments

The paper questionnaire survey was carried out among primary school students in grades 4, 5 and 6 by using stratified sampling method. Adopt "elementary school students use mobile phones and the investigation questionnaire", in reference to college students' mobile phone depends on behavioral intention and influencing factors of research after revision, the revised questionnaires including personal basic situation, mobile phones use, mobile phone use feeling, 16 diagnosis, such as: "I would rather choose mobile phones and the chat, do not wish to directly face to face" "ringtone not ring for a period of time, I will feel not adapt, and subconsciously see if cell phones have not call" "if long time no use mobile phone or tablet, I would feel uncomfortable", etc.

The mobile phone dependence scale was scored in five points. The higher the score of scale the higher the degree of mobile phone addiction. The reliability and validity of the questionnaire are good and the alpha coefficient is 0.87.

The total score of the scale is 90. The total score is less than 48 points indicating a low degree of dependence or no dependence phenomenon. If the total score is greater than 48, there is mobile phone dependence. If the total score is greater than 68, the mobile phone dependence is considered serious.

Students' grades in Chinese, mathematics and English were taken as their academic grades, and the scores were converted into corresponding standard z-scores and added up in each grade, which was taken as the measurement standard of the subjects' grades.

Statistical software SPSS19.0 was used for statistical analysis.

III. Results

3.1 The status of mobile phone used by college students

The results showed that 38.7% of primary school students have their own mobile phone, which is lower than the data of ZhongYue (2016) in the survey and analysis of the use of mobile phones by primary school students (71%). 41.3% of them asked for the phone themselves and the rest was given by parents or elders; 75.5% of primary school students used mobile phones for less than half hours per day, 12.6% of them used mobile phones for more than 1 hours per day.

Table 2. Time spent by primary school students using mobile phones very day.

Hour (h)/day	n	%

Within 0.5h	141	75.5%
0.5—1h	22	11.9%
1—1.5h	16	8.6%
More than1.5h	8	4.0%

Table 3 showed the top three uses of mobile phones for primary school students from high to low were interpersonal communication, information searchand phone call. The highest frequency of primary school Students' mobile phone use is Interpersonal communication related to social interaction, followed by information search related to study. Playing games is lower frequency to be used.

Table 3. The use of mobile phone in primary schoolstudents

Usefulness	n	%
Interpersonal communication	135	72.50
Phone call	67	35.90
Information search	120	64.25
Game	10	5.44
Others	7	4.21

3.2 Primary school students' mobile phone addiction and grade differences

The survey found that 41.59% of primary school students were dependent on mobile phones, more than two-fifths, and the incidence of mobile phone dependence was medium. Among them, the proportion of fourth-grade students who are moderately dependent on mobile phones accounts for 9.32%. Low dependence accounted for 27.21%; those without dependence accounted for 40.31%; The proportion of grade 5 students with moderate or higher mobile phone dependence was 9.51%. Those with low degree of dependence accounted for 40.23%; the proportion without dependence was 39.77%; The proportion of grade 6 students who are moderately dependent on mobile phones accounts for 9.21%. Low dependence accounted for 25.27%; those without dependence accounted for 39.02%; the results of variance analysis showed that there was no significant difference in the distribution of mobile phone dependence among different grades. (F=5.231, P>0.01)
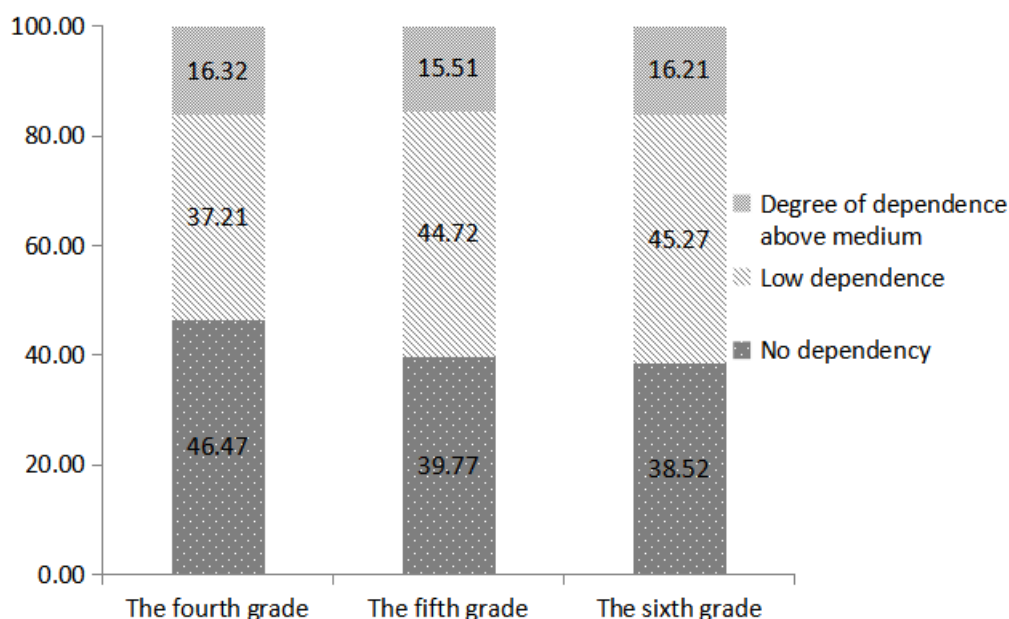
Figure 1 Distribution of mobile phone dependence in each grade

3.3 Primary school students' mobile phone addiction and phone usage time

According to the statistical analysis of the survey results, there is a significant positive correlation between mobile phone use time and the degree of mobile phone dependence (r=0.425, p<0.01).

3.4 The degree of primary school students' mobile phone addiction

The average score of the five-point rating scale for comprehensive primary school students' mobile phone dependence shows that 9.45% of primary school students have an average score of more than 3 points for each question. 89.7% of primary school students with an average score of less than 3 points per question have low or no dependence. 0.8 % of primary school students on average more than 4 points per question are heavily dependent on mobile phones. In other dimensions, there was no significant difference in the average score of mobile phone dependence between only and non-only children. There was no significant difference in phone dependence between male and female primary school students.

Table 4 The degree of primary school students' mobile phone addiction

	None	Slight	Medium	Serious	Very Serious
I feel bad if I don't use my phone or ipad for a long time.	30.21%	35.36%	2.30%	15.15%	16.98%
I'm often afraid of my phone and ipad shutting down automatically.	39.30%	29.19%	5.04%	20.48%	5.99%
My phone is a part of me, and once it's gone, I feel like I've lost something.	35.91%	41.03%	2.36%	12.21%	8.49%
When the phone doesn't ring for a while, I don't feel comfortable.	40.45%	20. 26%	15.20%	14.56%	9.53%

3.5 Academic achievementsand its correlation with mobile phone addiction

Table 5 shows that there is a significant negative correlation between primary school students' mobile phone addiction and academic achievement, indicating that the more serious the primary school students' mobile addiction is, the lower the academic achievement. It can be seen that mobile phone addiction has a certain degree of adverse impact on the academic performance of primary school students.

Table 5. Descriptive statistics of academic achievementand its correlation with MPA

Variable	N	M	SD	Pearson Correlation coefficient
Mobile phone dependence	187	33.4866	20.09771	-0.626**

*P<0.05 ，**P<0.01，***P<0.001

IV. Discussions

4.1 MPA of primary schoolstudents is **significantly negatively correlated with their academic performance**

This study found that 14.97% of primary school students were seriously addicted to mobile phones.Far less than Yang li's (2017) study, 34.9 % of primary school students who have mobile phones are inclined to rely on them.The guess is that the number of subjects in this study is small and the sample is not representative enough.However, inthis study, mobile phone dependence was negatively correlated with academic performance.This is consistent with the research of Zhang Guojin and Cao Lichun (2016) and Fang Xianglian (2014) on the relationship between mobile phone addiction and academic performance in junior high school students.

A study have shown that the greater the use of mobile phones, the greater the likelihood of absenteeism and low grades (Young, 1998;Scherer K,1997), and thus worse academic performance. Our study found that mobile phone use was positively correlated with mobile phone dependence.Thus confirming the relationship between mobile phone dependence and academic performance.In addition, Barber (1997) and Brady (1996) showed that using mobile Internet can distract students from their study.This means that if students spend too much time surfing the Internet on their mobile phones, they will have little or no time to study.These previous studies support the current findings that there is a significant relationship between phone addiction and academic performance.

4.2 Gender differences in primary schoolstudents' mobile addiction

There is no consensus on whether there is a gender difference in phone addiction.According to a study, compared with boys, girls spend more on mobile phones and spend more time using them every day, and more inclined to use social software such as WeChat and watching movies and listening to music, thus it can be seen that girl's cell

phone use is mainly used for building and maintaining social relationships (Beranuy Marta, Oberst Ursula, etc., 2009), were also more likely to form the mobile phone depend on (Chen Yonggang, HaoYue, 2018).However, some reports suggest that men have a higher prevalence of Internet and mobile phone addiction (Lam and Peng, 2010;Nikhita et al., 2015;Sharma et al., 2015), because men are more likely to use electronic devices to indulge in online games (LimalemlaJamir and MonaDuggal, 2019).In this study, there was no significant gender difference in mobile phone addiction among primary school students.The author believes that the age of the subjects has not yet entered the stage of puberty, and the female students have relatively low need for interpersonal communication with the help of communication equipment.In addition, primary school students have more extracurricular activities, soprimary school boys are less likely to use mobile phones for entertainment than middle school, high school and college students.This may have something to do with the different needs of boys and girls.As we explore gender differences in phone dependence, we also need to explore the reasons behind them, which makes more sense for targeted prevention interventions.

4.3 Purpose of primary school mobile phone use

Interpersonal communication is one of the main purposes for primary school students to use mobile phones. Compared with other interpersonal communication channels, mobile phone chat software communication is faster and cheaper. Moreover, mobile communication has the ability for primary students to satisfy belonging and love in peer group communication Need to also bring a mobile, private, and portable experience to elementary school students.This is consistent with the research of Mizuko Ito and Okabe(2005), who believe that the reason why young people are prone to addiction is that they have fewer social contacts and a relatively small social circle. However, they are eager to have high-intensity interaction with the outside world, so mobile phone becomes a portable tool for them to communicate with the outside world. Nevertheless, interacting with a desire for other people through a mobile phone can backfire.Mizuko Ito, et al found that due to the lack of normal ways and means of social interaction among young people, mobile phones have become a substitute for their social contact.Some studies have suggested that self-esteem is negatively correlated with mobile phone addiction (You Zhiqi, Zhang Yingru, 2019).Billieux and his colleagues (2012,2015) found that individuals with low self-esteem often experience cognitive distortion and emotional maladjustment, resulting in higher social anxiety and more sensitive evaluation of interpersonal relationships.In emotional relationships, people tend to escape from reality (Gyurak and Ayduk, 2007), especially for fear of meeting others face to face in the real world (Ezoe et al., 2009), so they have to overuse mobile phones to get comfort, which makes it difficult for people to establish good interpersonal relationships in the real world (Leary et al., 1995). Besides, primary school students often use inanimate communication tools, which will narrow the circle of interpersonal communication of primary school students. Some students are even addicted to the virtual world, which is divorced from the society and reality, leading to the formation of students' solitary character (He Xuehuan, Zhang Zhihua, 2018).Zhou Hanghui et al. (2011) found that mobile phone addiction can reduce interpersonal perception and lead to interpersonal communication disorders.Therefore, parents and schools should set up a correct concept of interpersonal

communication for children and create a good and harmonious interpersonal communication environment.

4.4 Source of primary school students' mobile phone

Nearly half of the elementary school students actively requested elders to obtain mobile phones. After analysis, they were affected by factors such as family ideas, herd mentality, and comparison psychology. Among them, the main reason was the influence of peers. Primary school students 'mentality of comparison is one of the main driving forces for mobile phone consumption. Because of seeing a companion owning a cell phone, elementary school students will have an urgent yearning mood and want to own the same, and they will not be able to satisfy their needs. Zhou Xihua (2010) found that an important reason for the phenomenon of mobile phone addiction in colleges and universities is that some students from superior families show off in front of classmates to satisfy their vanity. This is easy to infect the people around them, causing them to imitate them for various needs or desires. This trend will aggravate the phenomenon of mobile phone addiction. In addition, studies have shown that students from families with better economic status show stronger emotional responses when they cannot use mobile phones normally (Zhang Guojin, Cao Lichun, 2016). The authors speculate that parents of students with better family conditions are more likely to meet the requirements of their children, and form an indulgent or laissez-faire parenting style and family environment, which may lead to their children's addiction to mobile phones.

The important finding of this study is that primary school students' mobile phone addiction has a significant negative impact on their academic performance.Primary school academic performance is mainly reflected through the test results, mainly to investigate the students' basic knowledge grasp and application ability, which is related to the efficiency of primary school students' review at ordinary times. The primary school students usually used for class time is basically the same, if they spend more time on their cell phone, they spend less time studying and their academic performance declines.Some studies have also shown that primary and secondary school students bring mobile phones back to school and play mobile phones in their spare time, which causes them to lose their concentration in class and have difficulty in keeping up with the course progress, thus leading to a vicious circle of declining academic performance. Moreover, mobile phone dependence will weaken students' learning motivation and reduce their academic performance (LanYukun, Ding Jiaoer et al., 2019). Therefore, parents, schools and society need to attach great importance to the situation of mobile phone addiction in primary school students. Make pupil reduce the use of mobile phone, put their mind more on study and improve their study results.

V. Conclusion

In order to understand the status and relationship between mobile phone addiction and academic performance of primary school students, Chinese primary school students were surveyed on mobile phone use, mobile phone addiction and academic performance. The results showed that 38.7% of primary school students had their own mobile phone. 41.3% of the students with mobile phones asked for mobile phones on their own initiative, and the

rest were given a mobile phone by their parents or elders. 12.6% of primary school students use mobile phones for more than one hour a day and 24.5% use mobile phones for more than half an hour a day. From high to low, the top three ways primary school students used their phones were networking, information search and phone calls. Interpersonal communication is one of the main purposes for primary school students to use mobile phones, but the excessive use of mobile phones often goes against interpersonal communication.About 16% primary school students have the tendency of mobile phone dependence; there is no significant difference of grade, gender and one-child in mobile phone dependence. There was a positive correlation between cell phone use time and cell phone dependence.Pupils' academic performance was at an upper level.There was a significant negative correlation between MPA and academic performance.

According to this study it is very necessary for parents, schools and society to pay attention to the problems of mobile phone addiction and academic performance of primary school students.This research has strong social practice significance and theoretical value.Future research should adopt experimental methods, consider more cognitive and social variables, further explore the psychological mechanism and career preparation of primary school students' mobile phone addiction, and establish operational procedures for prevention and intervention of mobile phone addiction.

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