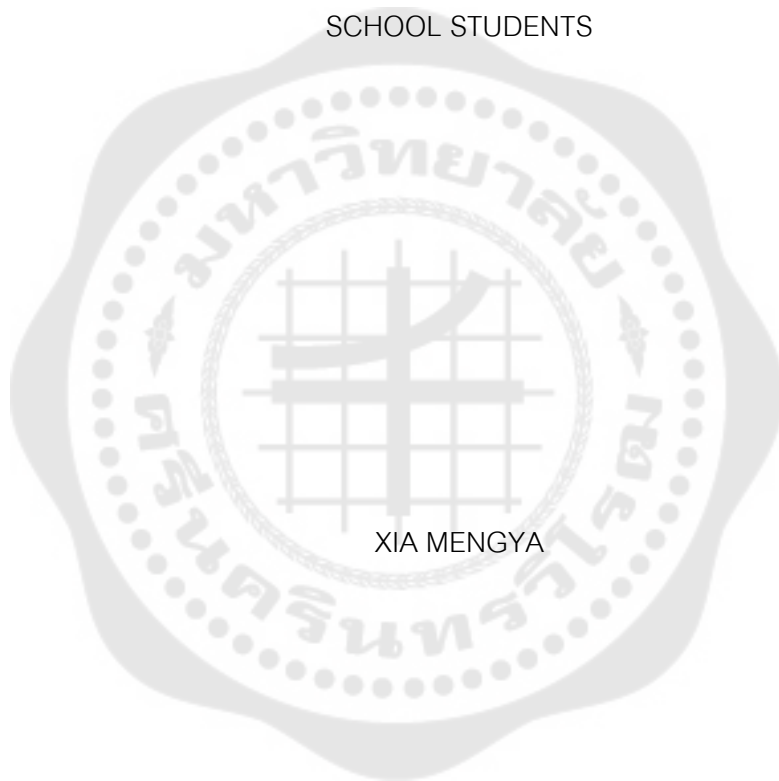FACTORS INFLUENCING ON MOBILE PHONE ADDICTION AMONG CHINESE MIDDLE

SCHOOL STUDENTS

XIA MENGYA

Graduate School Srinakharinwirot University

2023

ปัจจัยที่มีอิทธิพลต่อการติดโทรศัพท์มือถือของนักเรียนมัธยมศึกษาตอนต้นประเทศจีน

XIA MENGYA

ปริญญานิพนธ์นี้เป็นส่วนหนึ่งของการศึกษาตามหลักสูตร
การศึกษามหาบัณฑิต สาขาวิชาจิตวิทยาการศึกษาและการแนะแนว
คณะศึกษาศาสตร์ มหาวิทยาลัยศรีนครินทรวิโรฒ
ปีการศึกษา 2566

FACTORS INFLUENCING ON MOBILE PHONE ADDICTION AMONG CHINESE MIDDLE

SCHOOL STUDENTS

XIA MENGYA

A Thesis Submitted in Partial Fulfillment of the Requirements

for the Degree of MASTER OF EDUCATION

(M.Ed. (Educational Psychology and Guidance))

Faculty of Education, Srinakharinwirot University

2023

THE THESIS TITLED

FACTORS INFLUENCING ON MOBILE PHONE ADDICTION AMONG CHINESE MIDDLE SCHOOL STUDENTS

BY

XIA MENGYA

HAS BEEN APPROVED BY THE GRADUATE SCHOOL IN PARTIAL FULFILLMENT

OF THE REQUIREMENTS FOR THE MASTER OF EDUCATION

IN M.ED. (EDUCATIONAL PSYCHOLOGY AND GUIDANCE) AT SRINAKHARINWIROT

UNIVERSITY

....

(Assoc. Prof. Dr. Chatchai Ekpanyaskul, MD.)

Dean of Graduate School

....

ORAL DEFENSE COMMITTEE

.... Major-advisor .... Chair

(Dr.Asama Campiranon) (Assoc. Prof. Dr.Sukaroon Wongtim)

.... Co-advisor .... Committee

(Assoc. Prof. Dr.Patcharaporn Srisawat) (Assoc. Prof. Dr.Skol Voracharoensri)

Title	FACTORS INFLUENCING ON MOBILE PHONE ADDICTION AMONG CHINESE MIDDLE SCHOOL STUDENTS
Author	XIA MENGYA
Degree	MASTER OF EDUCATION
Academic Year	2023
Thesis Advisor	Doctor Asama Campiranon
Co Advisor	Associate Professor Doctor Patcharaporn Srisawat

The aims of this research are as follows: (1) to study the level of mobile phone addiction among middle school students; and (2) to study the factors affecting mobile phone addiction. The sample group consisted of 1,342 middle school students at Chongqing Agricultural School. This research had a mobile phone addiction survey with 27 questions, with an item objective congruent (IOC) of 0.96. The statistics used were basic statistics, including percentage and standard deviation. The research results found that students had a low level of mobile phone addiction at 27.80%. The factor that mostly influences phone addiction is family, followed by telephone use factors and general factors such as gender, age, and grade point average. When considering each factor, all three factors were significantly different ($p<0.05$)0, except for the general factor of age.

Keyword : Chinese middle school students, Mobile phone, Addiction factor

ACKNOWLEDGEMENTS

Here, I would like to express my gratitude to many people, and their support and help have played an important role in my growth in my postgraduate study and life.

First of all, I would like to sincerely thank my advisor. In the process of studying for my postgraduate degree, my tutor provided me with valuable guidance and support with his selfless spirit, and gave me profound academic inspiration. My tutor's scientific research style and his diligent working attitude have had a profound impact on me, which will become a valuable wealth in my future life.

At the same time, I would like to thank my friends for their encouragement and support when I was in trouble. I would like to thank my family, who have always been my most solid backing and provided me with endless love and support. Without their help and support, I could not complete this paper.

In the process of research, I have experienced many challenges and difficulties, but each time I have gained something. These gains could not have been achieved without the help and support of mentors, friends and family. Here, I would like to express my most sincere thanks to them.

Finally, I would like to share my outlook and plans for future academic research. I will continue to work hard and keep learning and exploring. I believe that in the future, I will meet more opportunities and challenges, but no matter when, I will remember this gratitude, with practical actions to repay those who have helped me. Thanks again!
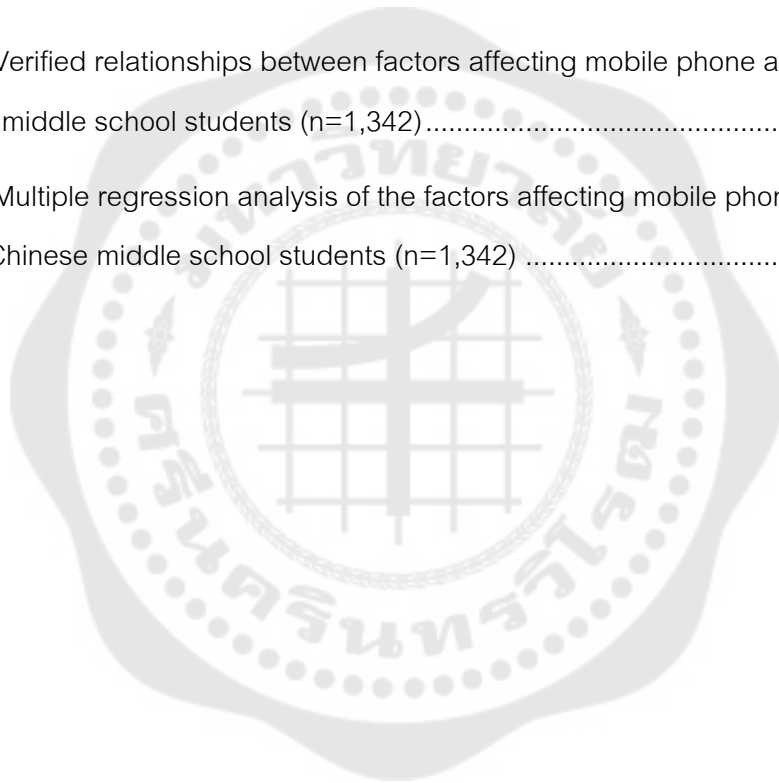
XIA MENGYA

TABLE OF CONTENTS

LIST OF TABLES

CHAPTER 1
INTRODUCTION

1.1 Background

Mobile phones are becoming more and more common in the digital age, especially among young people. This has led to worries about the possible harm. They might affect several facets of life, particularly the addictive habits that come with using them (Raut, 2021).

This study aimed to investigate the variables correlating to and affecting mobile phone addiction among middle school students, illuminating the complex interactions between general factors (sex, age, and academic performance) and family factors (birth order, parenting style, and mobile phone use) and mobile phone addiction that contribute to this condition.

The issue of mobile phone addiction, which is typified by excessive and obsessive usage that results in adverse outcomes, has gained considerable attention, especially concerning the development of adolescents (Abuhamdah & Naser, 2023). Adolescence is a critical time characterized by increased susceptibility to outside influences, identity discovery, and the formation of social networks. According to this perspective, the difficulties experienced by Chinese middle school students take on new dimensions due to the widespread use of mobile phones (Liu et al., 2023).

In recent years, the popularity rate of mobile phones among middle school students has shown an increasing trend, and it has almost become a standard for high school students to study and lives (Ezemenaka, 2013). However, with the increasing popularity of mobile phones among middle school students, its influence on middle school education and teaching has gradually highlighted the fact that students often use mobile phones in class. Outside the class, most of the students are also in a living and learning state, which not only seriously affects the study but also has a huge impact on the daily rest (Guinee & Mertz, 2015).

Middle school students using mobile phones for a long time will hinder their smooth communication with people around them, thus affecting their harmonious

interpersonal relationship. Middle school students who use mobile phones not only lack communication with classmates and teachers in school but are also more likely to have discord with their parents (Liang et al., 2023). Those children with mobile phones in the classroom are mostly in browsing websites, chat QQ, or see e-books, etc., at the same time, they told the teacher that the course content turned a deaf ear. They indulge in the mobile phone world like a layer of bubbles isolated from their "self" and the outside world, which at the same time will make them lonelier (Gao et al., 2023).

The adolescent stage is an important life cycle, during which they face a huge learning burden and seek opportunities to interact with the outside world with the hope of independently meeting the challenges of growth (Hashmi, 2022). However, they are often rejected or even afraid to share their thoughts with their parents and teachers, especially when their ability to understand the world and their self-management are relatively weak. Therefore, some teenagers choose to rely on mobile phones as a social tool, but the flood of negative information on mobile phones has seriously affected their healthy growth. After further research, we found that most of their time was spent on their mobile phones, other than their normal academic activities, usually no more than an hour and occasionally more than two hours (Wang, 2022).

The environment of Chinese middle schools is distinct and influenced by cultural, family, and educational elements that can have a big impact on how this group of students feel and act when using mobile phones (Chen, 2022). The way that people view mobile phones as social integration aids or status symbols depends on their self-regulation and societal expectations. A student's connection with their phone can also be significantly shaped by parental practices and family dynamics. For a thorough understanding of mobile phone addiction among Chinese middle school children, it is imperative to comprehend the ways in which these socio-cultural elements interact with psychological processes (Song, 2022).

In previous research, numerous scholars have examined factors that influence mobile phone addiction among students. Prasittichok et al. (2023) explored the influence of personal factors such as new media literacy and self-regulation, as well as

environmental factors such as social support and family upbringing on mobile phone addiction. Based on a survey of 140 students, Munasinghe (2016) explored the impact of usefulness, loneliness, family income level, and gender on addiction to smartphones. Chinese scholars are also dedicating their efforts to this field. Song (2022) explored the relationship between students' grade level, mobile phone usage time, parental attitudes toward students' smartphone usage, parental autonomy support, parental autonomy control, overall peer relationship scores, and the ownership of exclusive smartphones with mobile phone addiction. Pu et al. (2022) conducted a study involving 1200 middle school students, examining the impact of family dynamics on mobile phone addiction among adolescents. The research specifically focused on investigating the influence of variables such as the father-child relationship, parental relationships, maternal support for the father-son relationship, and perceived father involvement on mobile phone addiction.

While previous research has explored various aspects influencing smartphone addiction among adolescents, particularly middle school students, there has been a lack of comprehensive investigation into the variables involved. As the issue of mobile phone addiction among Chinese middle school students becomes increasingly severe. This study intends to fill the existing research gap by conducting a detailed investigation into the diverse factors that impact mobile phone addiction among middle school students in China. Through quantitative analysis of the interaction among general factors, family factors and mobile phone use factors, the research aims to offer valuable insights. These insights can then be utilized to shape educational policies, provide guidance to parents, and develop intervention programs focused on nurturing a positive and balanced connection with technology among adolescents in China. By gaining a thorough understanding of the factors contributing to mobile phone addiction, efforts can be directed towards establishing an environment that promotes the holistic development of middle school students in the era of digital technology.

1.2 Questions of the Study

1.2.1 What factors are correlated with mobile phone addiction?

1.2.2 What factors affect mobile phone addiction?

1.3 Objectives of the Study

1.3.1 To study factors correlating to mobile phone addiction among middle school students.

1.3.2 To investigate factors affecting mobile phone addiction among middle school students.

1.4 Significance of the Study

With the rapid progress of mobile device technology and the increasing diversification of application fields, mobile phones have gradually established their role as the primary internet gateway. The number of internet users in China continues to rise, and college students have become the main group of mobile internet users. However, we must also note that some college students are falling into the dilemma of mobile phone dependence, which not only has a negative impact on their academic performance, but also disturbs their daily lives. It is particularly worth mentioning that middle school students, as an important educational group, play a key role in the process of conveying excellent talents to society. In the past, the popularity of mobile phone use among middle school students was not high, so the relevant research mainly focused on college students.

With the widespread use and popularization of mobile phones, the corresponding problem of mobile phone addiction among middle school students has gradually attracted the attention of scholars. This paper studied the students in middle school to study the influencing factors of mobile phone addiction. The psychological development of middle school students is unique; for example, their self-awareness gradually increased, but the mind was not fully mature; their emotions were rich but had large mood fluctuations; and their willpower was not stable. Therefore, it is very important for us to deeply understand and study the phenomenon of mobile phone addiction among middle school students.

1.5 Scope of the Study

This research used a quantitative approach to explore the causes of mobile phone addiction in Chinese middle school students. The population of this study was 2536 middle school students at Chongqing Agricultural School. A simple random sampling method was employed to select the respondents from the population. After that, the sample group consisted of 1342 middle school students at Chongqing Agricultural School. Simple random sampling stands out as a widely utilized sampling approach in scientific investigations. It is specifically chosen for populations characterized by high homogeneity, where research participants are randomly chosen to engage in the study (Bhardwaj, 2019). Building on existing literature, a framework was created and a questionnaire was designed to investigate factors related to mobile phone addiction and their impact on its development in this demographic.

1.6 Definition of Terms

1.6.1 Mobile phone refers to a device equipped with an advanced operating system capable of diverse functionalities and applications (García & Mendez, 2013).

1.6.2 General factors influencing mobile phone addiction refer to a combination of demographic and behavioral elements that collectively contribute to the likelihood and patterns of mobile phone addiction in individuals, specifically middle school students. These factors include sex, age, and academic performance, as follows: 1) Sex refers to the biological traits that distinguish individuals as either female or male (Morse, 1993). 2) Age is an unchanging attribute or a measurable entity indicating the duration of an individual's life or the existence of something (Sign, 2022). 3) Academic performance is defined as the degree to which a student completes their studies and associated tasks (Aminu, M., & Timothy, 2014).

1.6.3 Family factors refers to the family dynamics related to the birth order of the children and parenting style, both of which contribute to the complex interplay influencing the likelihood of mobile phone addiction in middle school students. Birth order means the numerical order of a child's birth within a family (Paulhus, 2008). Parenting style denotes the parenting methods employed by the parents (Nancy, 1999).

1.6.4 Mobile phone use factors refer to the motivations and frequency of use associated with middle school students' engagement with their mobile phones. These factors include the desire for social interaction, information acquisition, and entertainment, as well as the regularity with which students use their mobile phones to fulfill these needs. The combination of these elements contributes to understanding the various aspects and influences shaping mobile phone usage patterns among middle school students (Choi & Lee, 2015).

1.6.5 Mobile phone addiction means that users cannot control the time they use their mobile phones. It is used regularly and for a longer period than intended. Users feel frustrated when they do not use their mobile phones to receive news and information, both educational and entertainment. Users have high costs associated with using the phone. Users often argue with family members about long-term phone use. Users cannot concentrate on studying and feel restless when not using mobile phone (Moattari et al., 2017).

1.6.6 Middle school students are defined as individuals aged between 12 and 18 (Thyne & Anhaus-Brey, n.d.) who were enrolled in Chongqing Agricultural School during the data collection period.

1.7 Research Framework

1.General factors (Age, Gender, and GPA) 2. Family factors (Birth order, Parenting style) 3. Mobile phone use factors	→	Mobile phone addiction
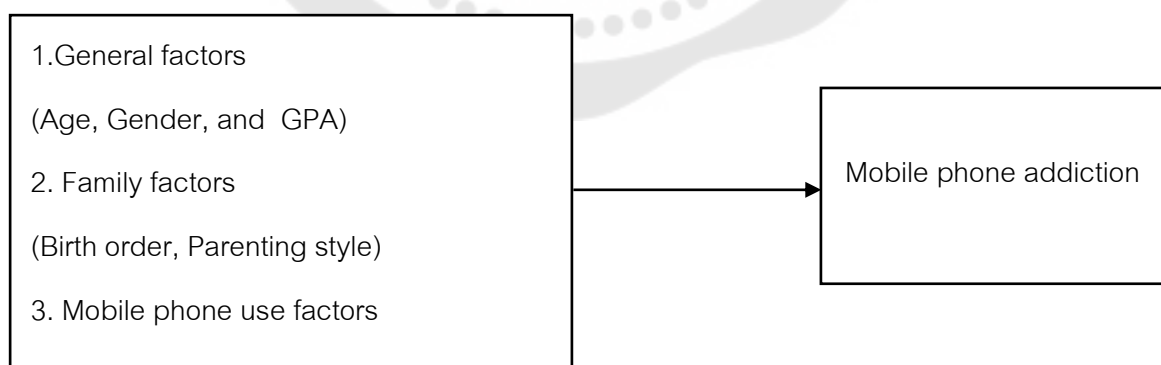
CHAPTER 2
LITERATURE REVIEW

2.1 Cell Phone Addiction

2.1.1 The Concept of Mobile Phone Addiction

At present, there is no consensus on the precise definition of the concept of "mobile phone addiction." This phenomenon is also often referred to as "mobile phone syndrome," "mobile phone dependence," "mobile phone dependence syndrome," "mobile phone anxiety," and "problematic mobile phone use." These terms are put forward for the overuse of mobile phones to a certain extent, which has been deeply studied and discussed by researchers and scholars from various angles. As a result, we found that the definition of mobile phone addiction presents a variety of characteristics that are difficult to enumerate.

Bianchi and Phillips (2005) borrowed from a theoretical framework on behavioral addiction, where they defined the five key factors of problematic mobile phone use, which are tolerance, ability to escape other problems, withdrawal, craving, and possible negative effects, as problematic mobile phone use. They further suggest that these problems may stem from an individual's lack of social control over his own behavior or lack of ability to self-control.

According to the American Psychological Association's (APA) (n.d.) definition of substance addiction, the symptoms of cell phone dependence are identified. These symptoms mainly include six aspects, which are significance, conflict, excitability, tolerance, withdrawal, and recurrence.

According to a study by Han and Qi (2005), mobile phone addiction is regarded as a disease caused by the excessive use of mobile phone, which causes physical or mental discomfort.

Shi (2009) proposed a new term: "mobile phone dependence," also known as "mobile phone syndrome," "mobile phone addiction," and "mobile phone anxiety." He defines it as a state of obsession in which an individual's inability to control their mobile phone use results in serious impairment of their physical, mental, and social functioning.

This phenomenon is often referred to as "phone addiction." Although the term "phone dependency" is often misinterpreted to mean an overdependence on the physical body of the phone, it actually describes a much deeper phenomenon. This phenomenon stems from an individual's inability to control their frequent use of mobile phones, including gaming, web browsing, text messaging, and various other applications, so much so that they become addicted. This not only has a serious negative impact on their career and academic activities but also has a non-negligible impact on their daily lives and mental health. Therefore, we can think of mobile phone dependence as a "behavioral addiction."

While studying the over-reliance on mobile phones of college students born in the 1980s, Liang and Yang (2010) found that the phenomenon was seen as a mixture of anxiety and expectation. These young people showed a strong state of psychological desire for dependence, and they also point out the main symptoms of mobile phone dependence, which mainly include seven aspects of performance.

Li (2018) has deeply studied the phenomenon of "over-reliance on mobile phones," pointing out that it is a mode of behavior in which individuals cannot restrain themselves and use mobile phones without restraint. This behavior not only has a negative impact on the individual's physical and mental health but may also hinder the normal conduct of their daily life and work. Usually, people keep their phones with them and even check them frequently, unconsciously, in case they miss any important information. However, once their phones are out of reach, the signal disappears, or the battery runs out to recharge, they feel lonely and depressed. In addition, they may feel anxious if their phones do not sound for a long time or if they make significantly fewer calls. In real life, they may tend to replace face-to-face communication by texting or making phone calls. These behavioral patterns partly reflect the excessive reliance on mobile phones in modern society.

There is no consistency in the phenomenon of "mobile phone dependence." According to Moattary and others (2017), the relatively suitable definition of mobile phone addiction is that users cannot control the time they use their mobile phones. It is

used regularly and for a longer period than intended. Users feel frustrated when they do not use their mobile phones to receive news and information, both educational and entertainment. Users have high costs associated with using the phone. Users often argue with family members about long-term phone use. Users cannot concentrate on studying. Feeling restless when not using your mobile phone (Moattari et al., 2017).

2.2 Current Situation of Mobile Phone Addiction

Nowadays, smart phones have become an important part of our daily lives, and their powerful functions make our lives more convenient and efficient. Whether social media or utilities, you can easily get the information you need from these devices. For students, they can store a large number of educational resources, such as online courses and e-books, so that they can do their own learning anywhere. In addition, there are many mobile applications designed for learning that help users expand their knowledge and improve their skill levels. For example, we can use mobile phone navigation to find strange routes, or we can complete various tasks such as food consumption, water and electricity payment, and so on. Not only that, but we can also book transportation through our mobile phones, including taxis, planes, and train tickets. Therefore, modern people do not need to carry cash or handbags when they go out but only need a mobile phone to meet all their needs, which is undoubtedly great progress. As this trend developed, some new business models were born. Taking Uber and Didi, for example, two companies allow certified drivers to provide services, attracting many young people and college students to use their free time to contribute to the family economy. Although smart phones have brought a lot of convenience and positive effects to our daily lives, their negative effects are also gradually becoming more prominent.

In recent years, the phenomenon of "phubbers" has appeared frequently in every scene of our daily lives. Whether it is on public transportation such as the subway and bus or at gatherings with friends and family, they are focused on the screen, which is usually a mobile phone. However, this behavior not only deprives them of real-life interaction opportunities but also leads to the creation of a new sense of loneliness and alienation.

While everyone is focusing on their own mobile phones, the occasion that should be full of laughter becomes silent, leaving only a strange atmosphere. The same is true at home; whether in the same room with family or in intimate time between couples, it is often occupied by endless electronic devices. This makes the family environment seem very quiet and depressing. Although no one calls, people habitually take out their phones to check messages in case something important is missed. Therefore, even in the bathroom, we can often see someone squatting while brushing his or her mobile phone. This situation shows that when we face problems, the first thought is to deal with them through mobile phones rather than direct communication. It is clear that while mobile phones have become a necessity, to some extent, they are also weakening people's social skills.

The problem of excessive use of smart phones is very obvious among contemporary college students. They are keen to use various mobile apps such as WeChat, Weibo, and QQ to show photos of their daily activities and lives and have become accustomed to checking the status of their phones anytime and anywhere. The driving force behind this behavior is the desire to see their social media updates attract attention and interactive feedback for a sense of accomplishment. However, some college students may fall into the abyss of mobile phone games or online novels. In addition, others are trying to use mobile phones for various small business projects. No matter extracurricular time or course time, many college students will frequently browse the mobile phone screen and almost touch the mobile phone for 24 hours a day. If they leave home without a mobile phone, they will feel extremely anxious and eager to return to the dormitory to be picked up. This situation has a serious negative impact on the studies and lives of college students.

2.3 Factors of Mobile Phone Addiction

With the rapid progress of technology in the 21st century, smart phones have been widely used and growing, which undoubtedly indicates that we have entered a fast-paced period of information. Today, both elementary and high school students generally have their own mobile devices. Since, these tools were first used to send text

messages and make calls, they have been given more features, such as installing various applications to get information and deliver a variety of information, making mobile phones a central part of modern life.

However, this phenomenon has also had a profound impact on students' education and lives, especially for those teenagers who are receiving higher education, and their lifestyle has been greatly impacted. Excessive reliance on mobile phones can lead to impaired physical health while also disrupting normal learning and social activities, thus leaving their mental state in exhaustion. It is worth noting that this situation is not limited to Internet addicts but has begun to penetrate into the younger generation, including some younger children. Therefore, we can see that the problem of mobile phone addiction is not only a personal problem but also a social challenge.

2.3.1 General Factors: Age, Sex, and Academic Performance

Sex: Moser (1993) mentioned that sex pertains to the biological traits that distinguish individuals as either female or male. Tian and others (2017) found that there are significant differences in internet addiction behaviors between men and women. Men spend more time online each week than women, and they use online games more than women, which may be caused by the different interests of different genders. Male college students are more likely to seek new and different experiences brought by online games. Studies have shown that gender has a certain impact on mobile phone addiction in middle school students.

There are significant differences between boys and girls in the dimensions and total scores of mobile phone addiction among middle school students. Specifically, boys are significantly higher than girls in the positive expectation dimension, while girls are significantly higher than boys in the other four dimensions and total score, indicating that girls are more serious than boys in the overall and multi-dimensional mobile phone addiction. Therefore, gender has a certain impact on middle school students' mobile phone addiction, but at the same time, other factors such as academic performance will also have an impact on mobile phone addiction.

Age: Age is defined by Sigh (2022) as an unchanging attribute or a measurable entity indicating the duration of an individual's life or the existence of something. If you look closely, you will find that among all the children who are addicted to mobile phones, the adolescent children are the most addicted. So why are teenagers the most addicted to mobile phones? Fundamentally speaking, this is actually the law of growth that makes decisions. Adolescence is the stage of dramatic changes in body and mind, In the critical transition period, their height and weight increase, their bodies become increasingly close to adults, and their psychological development often cannot keep up with the speed of physiological development. Students at this stage of psychological characteristics have strong self-esteem, and adolescent rebellion makes its desire for independence, easy to appear between parents.

The use of mobile phones can make communication objects not have to communicate face-to-face. This person provides a buffer and a safe space. With the use of a mobile phone to communicate with strangers, they can completely hide their real identity, social status, economic status, and other privacy from the other side, and then, according to their ideal personality, shape the image and do things. Mobile phone network information is inclusive; students cannot restrain and control their Internet behavior and cannot resist the temptation of the virtual world. Bianchi and Phillips (2005) investigated age and sex in demographic variables as independent variables and mobile phone addiction behavior as dependent variables and showed that age factors had a strong predictive effect on mobile phone addiction behavior.

Academic performance: Academic performance, a widely employed gauge of success in educational settings, is defined as the degree to which a student completes their studies and associated tasks (Aminu & Timothy, 2014). The impact of academic performance on mobile phone addiction for middle school students is a complex problem. On the one hand, some studies have shown a negative correlation between mobile phone addiction and academic performance.

Cell phone addiction may distract students and reduce their motivation and efficiency, thus affecting their academic performance. In addition, mobile phone

addiction may also lead to a waste of time, making it difficult for students to effectively plan and use their study time, leading to a lack of focus on learning and thus affecting their academic performance. On the other hand, academic performance is not the only factor affecting mobile phone addiction for middle school students. Other factors can also affect mobile phone addiction. For example, some students may overuse their mobile phones due to a lack of self-control or the pursuit of stimulation, while others may be prone to addiction to their mobile phones because of improper family supervision or education methods.

2.3.2 Family Factors: Birth Order, Parenting Style

Birth order: Birth order means the numerical order of a child's birth within a family (Paulhus, 2008). There is no clear scientific research proving that birth order has a direct impact on mobile phone addiction among middle school students. However, birth order may influence a child's upbringing and family status, thus further influencing their mobile phone use.

For example, the first child may be more watched and regulated by parents, so they may be less likely to overuse their phones. Conversely, later children may get less regulation and more freedom, which may make them more addicted to their mobile phones. Furthermore, different birth orders may influence a child's psychological traits, social status, and thus their use of the phone. For example, the first-born child may be more responsible and disciplined, while the later child may be more likely to feel lonely and anxious and thus more likely to use mobile phones for social support and comfort.

Parenting style: Parenting style denotes the parenting methods employed by the parents (Nancy, 1999). The influence of parental education style on the mobile phone addiction of middle school students is a topic of much attention.

Some studies suggest that inappropriate parenting practices may increase the risk of cell phone addiction in children. First, both overprotection and overstrict parenting practices can lead to problems with mobile phone use. Overprotected parents may limit too much of their children's freedom and make them feel a lack of autonomy

and desire to explore, while excessively strict parents may make their children have a rebellious mentality and instead seek entertainment and social interaction through mobile phones.

Secondly, the lack of fatherly love or maternal love in the family environment may also affect children's mobile phone use behavior. In this environment, children may be insecure and become over-dependent on their mobile phones to seek emotional satisfaction. In addition, a neglected parenting style may also increase the risk of mobile phone addiction.

Such parents may be too busy with work or other things to care about their children's emotional needs, and their children may use their mobile phones excessively because of their lack of companionship. In contrast, democratic parenting practices can help reduce their children's risk of mobile phone addiction. Such parents can give their children enough care and support, but they can also give them appropriate freedom and independence. Children who grow up in this environment tend to have better control over their mobile phone use behavior.

In conclusion, the impact of parenting style on mobile phone addiction in middle school students is a complex problem. Parents should pay attention to their parenting style, give their children enough care and support, and also appropriately limit their mobile phone use behavior. Only in this way can we help children establish healthy habits for using mobile phones and avoid the occurrence of mobile phone addiction.

2.3.3 Mobile Phone Use Factors: Use Motivation and Frequency of Use

Mobile phone use factors refer to the motivations and frequency of use associated with middle school students' engagement with their mobile phones. These factors include the desire for social interaction, information acquisition, and entertainment, as well as the regularity with which students use their mobile phones to fulfill these needs.

The combination of these elements contributes to understanding the various aspects and influences shaping mobile phone usage patterns among middle school students (Choi & Lee, 2015). The influence of motivation on mobile phone addiction in

middle school students is an important topic. The motivation of middle school students to use mobile phones mainly includes the following aspects:

Social motivation: One of the main motivations for middle school students to use their mobile phones is social interaction. They can keep in touch with friends, family, and classmates through their mobile phones, share their lives and feelings, and learn about others. This social motivation can meet the social needs of middle school students and enhance their social support and sense of belonging.

Motivation for information acquisition: Another important motivation for middle school students to use mobile phones is to obtain information and knowledge. They can access the information and knowledge they need by surfing the Internet, checking information, watching news, listening to music, and watching videos. This kind of information acquisition motivation can satisfy middle school students' thirst for knowledge and the desire to explore.

Entertainment motivation: the mobile phone can also provide entertainment and recreation functions for middle school students. They can relax themselves and relieve stress and fatigue by playing games, watching movies, listening to music, and checking microblogs. This recreational motivation can meet the entertainment needs of middle school students and provide the experience of relaxation and enjoyment.

However, if middle school students overuse mobile phones, these use motives may cause them to indulge in mobile phones, thus negatively affecting their studies and lives. For example, excessive use of mobile phones may cause problems with decreased sleep quality, poor concentration, and decreased academic performance. Therefore, parents and schools should guide middle school students to use mobile phones reasonably, clarify the purpose and time of using mobile phones, and avoid excessive reliance on mobile phones. At the same time, other entertainment and social channels should also be provided so that middle school students have more choices and can avoid addiction to mobile phones.

Frequency of mobile phone use: Mobile phone use frequency is an important factor affecting mobile phone addiction among middle school students.

Frequent use of mobile phones will lead to students' dependence on mobile phones, which further leads to mobile phone addiction.

First, frequent mobile phone use allows students to spend a lot of time on their phones, thus reducing their time for other activities. These other activities may include learning, sports, and socializing, and these activities are equally important to the growth and development of adolescents. Therefore, frequent use of mobile phones will cause students to rely too much on mobile phones and ignore other activities.

Secondly, the frequent use of mobile phones will also affect students' mental health. Excessive use of mobile phones may lead to negative emotions such as loneliness and anxiety. At the same time, excessive use of mobile phones will also affect students' social skills, as they may rely too much on social media on mobile phones rather than face-to-face communication.

In addition, the frequency of mobile phone use is also related to the home environment. Some families may not have effective regulation of their children's mobile phone use, which can lead to excessive use of mobile phones. At the same time, some parents may themselves be mobile phone addicts, which can set a bad example for their children.

Therefore, in order to prevent mobile phone addiction among middle school students, parents and schools should take measures to control the frequency of mobile phone use among students. For example, parents can set a fixed mobile phone use time and supervise their children's mobile phone use behavior. Schools can also guide students to use their mobile phones correctly through educational activities to improve their self-discipline. At the same time, parents should also pay attention to their own mobile phone use behavior to set the right example for their children.

2.4 Relationship between Variables

2.3.1 Relationship between general factors and mobile phone addiction

Currently, many studies have explored the relationship between gender and mobile phone addiction. According to Park and Li (2022), because sex exhibits different patterns of mobile phone addiction, it should be considered in relation to mobile phone

addiction. Chen and others (2017) conducted a study of more than 1,000 teenagers and found that 30 percent of boys and 29 percent of girls were addicted to their phones. While a relationship between gender and mobile phone addiction was shown, there was little difference between the sexes. Joy (2023) reports that no significant differences in cell phone addiction were found based on sex.

Considering the impact of age on mobile phone addiction, Sahu and others (2019) suggested that young people, particularly adolescents and youth are the primary users of mobile phones and are more likely to develop problems of mobile phone addiction. However, Jeong and Bae (2021) found that there is no significant relationship between age and mobile phone addiction.

The relationship between academic achievement and phone addiction has been examined by a number of researchers. The findings of Damiao and Cavaliere (2021) indicated that students with mobile phone addiction tend to have lower academic performance, while high-achieving students are more likely to avoid indulging in excessive mobile phone use. Conversely, Hawi and Samaha (2016) mentioned that students with a high susceptibility to smartphone addiction are less prone to attain cumulative grade point averages (GPAs) that are distinguished or higher.

2.3.2 Relationship between family factors and mobile phone addiction

There is little literature on the role of birth order in mobile phone addiction. Bojic et al. (2013) explored the possibility of substantial transformation in the upcoming mobile backhaul network through the integration of emerging wireless, optical, and software-defined technologies. The research findings revealed that every member of a household possessed the latest smartphone, irrespective of household income, and that smartphone usage was not significantly influenced by birth order. According to Joy (2023), there were no notable distinctions identified in mobile phone addiction concerning birth order.

The impact of parenting style on a child's phone addiction is obvious. The results of Lian (2016) study showed that a negative parenting style significantly influenced college students' smartphone addiction. According to Ching and Hong

(2017), the parenting style exhibited a positive correlation in predicting attachment, and attachment, in turn, positively correlated with self-regulation. Furthermore, self-regulation demonstrated a negative correlation with smartphone addiction. Abu Bakar and others (2021) indicated that students who interpret their parents' demonstration of either nurturing behavior or encouragement of autonomy are at risk of developing smartphone addiction.

2.3.3 Relationship between mobile phone use factors and mobile phone addiction

The way students use mobile phones may determine whether they will become addicted to them. Li and others (2023) stated that people who satisfy their social needs through smartphone usage may develop a dependency on these devices, resulting in the development of addictive behaviors. Moreover, Liu and others (2022) noted that mobile phones may be especially alluring to Chinese students as a source of entertainment, relaxation, and stress release. Mobile phones' success in meeting these demands may be attributed to their many features and applications' accessibility. Chinese students may be more prone to use these electronic devices for leisure and amusement since they provide a flexible and practical outlet, whether it be through gaming, social networking, or multimedia material. Moreover, Chao and Cheng (2009) demonstrated that mobile phones serve as effective supportive tools to support students' learning and working. They contend that mobile phones facilitate students in planning and managing learning strategies and activities. The portability of mobile phones is emphasized as a factor that offers flexibility in planning ahead for suitable learning strategies, ultimately contributing to the enhancement of students' assessment and management of their learning goals.

Time spent on mobile phones has been linked to addiction in previous studies. According to Parasuraman and others (2017), their findings indicate that extended or excessive use of mobile phones can result in changes in behavior and the development of addictive tendencies. This implies that a stronger connection with mobile phone addiction is established as the duration of mobile phone usage increases. Bağcı and Pekşen (2018) found that students who exceed 5 hours of telephone usage

exhibit a higher level of addiction compared to their peers. Additionally, students who utilize their phones for 3 to 5 hours show a higher level of smartphone addiction than those who use phones for 0 to 3 hours.

CHAPTER 3
METHODOLOGY

3.1 Research Design

This study employs a quantitative research approach to examine the factors contributing to mobile phone addiction among Chinese middle school students. Drawing insights from previous literature, the researchers have formulated a research framework. This framework was used design a questionnaire to probe into both the factors correlated to mobile phone addiction and those influencing the development of mobile phone addiction among this demographic.

3.2 Population and Sample

The population of this study were 2536 middle school students at Chongqing Agricultural School. The sample group consisted of 1342 middle school students at Chongqing Agricultural School, which was selected by simple random sampling.

3.3 Research Variables

3.2.1 Independent variables:

1. General Factors: Sex, Gender, GPA
2. Family Factors: Birth order, Parenting style
3. Mobile Phone Use Factors

3.2.2 Dependent variable:

1. Mobile phone addiction

3.4 Variable Interpretation

Age: Age is defined by Sigh (2022) as an unchanging attribute or a measurable entity indicating the duration of an individual's life or the existence of something.

Sex: Moser (1993) mention that sex pertains to the biological traits that distinguish individuals as either female or male.

GAP: Academic performance, a widely employed gauge of success in educational settings, is defined as the degree to which a student completes their studies and associated tasks (Aminu, M., & Timothy, 2014).

Birth order: Birth order means that the numerical order of a child's birth within a family (Paulhus, 2008).

Parenting style: Parenting style denotes the parenting methods employed by the parents (Nancy, 1999). It includes four styles which are Authoritarian, Authoritative, Permissive and Uninvolved.

Mobile phone use factors: Mobile phone use factors refers to the motivations and frequency of use associated with middle school students' engagement with their mobile phones. These factors include the desire for social interaction, information acquisition, and entertainment, as well as the regularity with which students use their mobile phones to fulfill these needs. The combination of these elements contributes to understanding the various aspects and influences shaping mobile phone usage patterns among middle school students (Choi & Lee, 2015).

3.5 Research Instrument

The research instrument utilized in this study was a questionnaire, tailored in accordance with the established research framework. The researcher developed this questionnaire with the aim of exploring what factors correlating and affecting mobile phone addiction among Chinese middle school students. These include general factors such as sex, age, academic performance, family-related factors like birth order and parenting style, mobile phone use factors and mobile phone addiction. The IOC scores for all of the variables all fell within 0.67 and 1.00. The results indicated that the questionnaire passed the content validity test, signifying that the items are considered appropriate for use in the research. The Cronbach's alpha value for all items is 0.93, indicating a high level of reliability. The items in survey on student mobile phone addiction (15 items) was rated by 5 level as shown in Table 1 and Table 2

Table 1 Positive item

Item number	answer				
	Rarely	Occasionally	Sometimes	Often	Always
	1	2	3	4	5
12,14,15			score		
	1	2	3	4	5

Table 2 Negative item

Item number	answer				
	Rarely	Occasionally	Sometimes	Often	Always
	1	2	3	4	5
1,2,3,4,5,6,7,8,9,10,11,13			score		
	5	4	3	2	1

3.6 Data Collection

After coordinating with the school, the questionnaire distribution occurred between October 13 and November 11. At the designated time, a standardized questionnaire was disseminated on-site for the survey. Subsequently, a unified collection of questionnaires was conducted, during which invalid questionnaires were excluded from the dataset.

3.7 Data Analysis

After data collection, the researcher inputted the data sequentially into the SPSS software. Utilize SPSS for conducting data analysis, employing Pearson's product-moment correlation coefficient (r) to identify correlations between variables. Input the variables showing significant correlations one at a time into the regression equation, and examine the predictions between these variables

CHAPTER 4

FINDINGS

4.1 Symbols Used in Data Analysis

For data analysis and the result meaning of the data analysis, the symbols used in data analysis are determined as follows:

n	Replace	Sample Size
p	Replace	p-value
b	Replace	Raw Scores Linear Regression
SE	Replace	Standard Error
β	Replace	Standard Scores Linear Regression
R^2	Replace	Square Multiple Correlation Coefficient
R^2_{adj}	Replace	Adjust Square Multiple Correlation Coefficient
df	Replace	Degree of Freedom
F	Replace	F-Test
t	Replace	t-test
p	Replace	p-value

4.2 Abbreviation Used in Data Analysis

Abbreviation used in data analysis are as follows:

X_1	Replace	Sex
X_2	Replace	Age
X_3	Replace	GPA 0.00-1.50
X_4	Replace	GPA 1.51 - 2.50
X_5	Replace	GPA 2.51 - 3.50
X_6	Replace	GPA 3.51 - 4.00
X_7	Replace	Eldest Child
X_8	Replace	Middle Child
X_9	Replace	Youngest Child

X_{10}	Replace	Only Child
X_{11}	Replace	Authoritarian
X_{12}	Replace	Authoritative
X_{13}	Replace	Permissive
X_{14}	Replace	Uninvolved
X_{15}	Replace	Interpersonal Communication Needs
X_{16}	Replace	Kill Time
X_{17}	Replace	Reflect Personality
X_{18}	Replace	Entertainment
X_{19}	Replace	Study or Work Needs
X_{20}	Replace	Lower 1 hours
X_{21}	Replace	1-2 Hours
X_{22}	Replace	3-4 Hours
X_{23}	Replace	5-6 Hours
X_{24}	Replace	Upper 7 Hours
Y	Replace	Mobile Phone Addiction

4.1 The Relationship between Factors and Mobile Phone Addiction among Chinese Middle School Students

The researcher studied the relationship between factors and mobile phone addiction among Chinese middle school students using Pearson product-moment correlation coefficient, as shown in Table 3

Table 3 Correlation coefficient of the factors and mobile phone addiction among Chinese middle school students

	X_1	X_2	X_3	X_4	X_5	X_6	X_7	X_8	X_9	X_{10}	X_{11}	X_{12}	X_{13}	X_{14}
Fa	1.00	0.02	0.09	0.08*	-0.12*	-0.10*	-0.12*	0.09*	0.32*	-0.32*	0.22*	-0.08*	-0.07*	-0.09*
X_1		1.00	0.00	-0.18*	-0.01	0.30*	0.14*	-0.10*	0.08*	-0.17*	-0.01	0.04	-0.01	-0.01
X_2			1.00	-0.51*	-0.30*	-0.22*	-0.05*	-0.03	0.07*	0.03	0.10*	-0.14*	-0.10*	0.11*
X_3				1.00	-0.41*	-0.30*	-0.04	0.16*	-0.02	-0.09*	0.05	0.08*	-0.04	-0.08*
X_4					1.00	-0.17*	0.02	-0.09*	-0.12*	0.21*	-0.02	-0.06*	0.02	0.06*
X_5						1.00	0.11*	-0.08*	0.08*	-0.16*	-0.19*	0.15*	0.18*	-0.10*
X_6							1.00	-0.40*	-0.44*	-0.34*	-0.07*	-0.09*	0.15*	-0.00
X_7								1.00	-0.29*	-0.23*	0.08*	0.08*	-0.14*	-0.02
X_8									1.00	-0.25**	0.10**	-0.02	-0.04	-0.04
X_9										1.00	-0.11*	0.05	0.00	0.08*
X_{10}											1.00	-0.35*	-0.50*	-0.20*
X_{11}												1.00	-0.32*	-0.13*
X_{12}													1.00	-0.32*

TABLE 3 (Continue)

Factors	X_{15}	X_{16}	X_{17}	X_{18}	X_{19}	X_{20}	X_{21}	X_{22}	X_{23}	X_{24}	Y
X_1	-0.05*	0.05*	-0.02	0.04	0.02	-0.29*	0.15*	0.03	0.12*	0.00	0.26*
X_2	-0.14*	-0.13*	0.10*	0.17*	-0.01	0.00	0.04	0.10*	-0.08*	-0.02	0.06*
X_3	-0.02	0.05*	-0.07*	0.05*	0.02	0.03	-0.06*	0.18*	-0.18*	0.14*	0.08*
X_4	0.06*	0.08*	-0.02	-0.12*	0.02	-0.01	0.03	-0.04	0.00	0.00	0.02
X_5	-0.04	-0.06*	0.10*	0.00	-0.03	0.00	0.06*	-0.09*	0.06*	-0.08*	0.08*
X_6	-0.01	-0.12*	0.01	0.11*	-0.04	-0.02	-0.03	-0.07*	0.18*	-0.08*	-0.25*
X_7	-0.00	-0.15*	0.14**	-0.03	0.04	-0.22*	0.12*	-0.01	0.02	0.08*	0.08*
X_8	0.05*	0.08*	-0.14*	0.02	-0.03	0.05*	0.03	-0.10*	-0.12*	0.07*	0.02
X_9	-0.01	-0.05*	0.06*	0.00	-0.01	0.02	-0.07*	0.04	0.14*	-0.12*	0.01
X_{10}	-0.03	0.16**	-0.10**	0.02	0.00	0.20*	-0.12*	0.07*	-0.07*	-0.05	-0.16*
X_{11}	0.09*	-0.10*	-0.03	0.01	0.00	-0.12*	-0.02	0.12*	-0.20*	0.31*	0.09*
X_{12}	-0.00	0.01	-0.15*	0.15*	0.00	0.17*	-0.14*	-0.09*	0.15*	-0.14*	0.00

TABLE 3 (Continue)

Fac	X13	X14	X15	X16	X17	X18	X19	X20	X21	X22	X23	X24	Y
X_{13}	1.00												
X_{14}	-0.18*	1.00											
X_{15}	-0.09*	0.02	1.00										
X_{16}	0.02	0.05	-0.31*	1.00									
X_{17}	0.13*	0.02	-0.46*	-0.21*	1.00								
X_{18}	-0.05	-0.08*	-0.42*	-0.19*	-0.28*	1.00							
X_{19}	0.04	-0.03	-0.10*	-0.04	-0.07*	-0.06*	1.00						
X_{20}	-0.01	0.01	0.08*	-0.02	-0.17*	0.11*	-0.04	1.00					
X_{21}	0.08*	0.05*	0.01	0.00	0.17*	-0.19*	-0.02	-0.37*	1.00				
X_{22}	-0.13*	0.06*	-0.04	-0.07*	-0.06*	0.19*	-0.02	-0.12*	-0.12*	1.00			
X_{23}	0.17*	-0.08*	-094*	0.15*	0.07*	-0.08*	-0.03	-0.32*	-0.33*	-0.10*	1.00		
X_{24}	-0.19*	-0.01	0.01	-0.10*	-0.05*	0.08*	0.13*	-0.29*	-0.30*	-0.10*	-0.26*	1.00	
Y	-0.03	-0.06*	-0.10*	-0.06*	0.10*	0.05*	0.02	-0.08*	-0.11*	0.26*	0.10*	-0.01	1.00

Note: *p<.05

Table 3: The relationship between general factors and mobile phone addiction among Chinese middle school students had positive correlation coefficients between 0.06 and 0.26; sex (X_1) and mobile phone addiction (Y) had the highest positive correlation coefficient of 0.26; age (X_2) and mobile phone addiction (Y) had the lowest positive correlation coefficient of 0.06; and GPA 3.51 - 4.00 (X_6) and mobile phone addiction (Y) had a negative correlation coefficient of -0.25.

Family factors and mobile phone addiction (Y) had the positive correlation coefficients between 0.08 and 0.09; authoritarian (X_{11}) and mobile phone addiction (Y) had the highest positive correlation coefficient of 0.09; eldest child (X_7) and mobile phone addiction (Y) had the lowest positive correlation coefficient of 0.08. Family Factors and mobile phone addiction (Y) had the negative correlation coefficient between -0.16 and -0.06; only child (X_{10}) and mobile phone addiction (Y) had the highest negative correlation coefficient of -0.16; uninvolved (X_{14}) and mobile phone addiction (Y) had the lowest negative correlation coefficient of -0.06.

Mobile phone use factors and mobile phone addiction had positive correlation coefficients between 0.05 and 0.26. 3-4 hours (X_{22}) and mobile phone addiction (Y) had the highest positive–correlation coefficient of 0.26; Entertainment (X_{18}) and mobile phone addiction (Y) had the highest positive correlation coefficient of 0.05; mobile phone use factors and mobile phone addiction had the negative correlation coefficients between -0.11 and -0.06; 1-2 hours (X_{21}) and mobile phone addiction had a negative correlation coefficient of -0.11; kill time (X_{16}) and mobile phone addiction (Y) had the lowest negative correlation coefficient of -0.06.

4.2 The Factors Affecting of Mobile Phone Addiction among Chinese Middle School Students

Before researcher analyzed factors affecting mobile phone addiction among Chinese middle school students, researcher verified factors affecting mobile phone addiction using Tolerance and VIF. After that, researcher analyzed Multiple Regression Analysis by enter method, as shown in Table 4

Table 4 Verified relationships between factors affecting mobile phone addiction among Chinese middle school students (n=1,342)

The Factors Affecting	Tolerance	VIF
Sex (X_1)	0.66	1.51
Age (X_2)	0.79	1.26
GPA 0.00-1.50 (X_3)	0.30	3.30
GPA 1.51 - 2.50 (X_4)	0.29	3.47
GPA 2.51 - 3.50 (X_5)	0.37	2.67
Eldest Child (X_7)	0.38	2.63
Middle Child (X_8)	0.45	2.20
Youngest Child (X_9)	0.37	2.68
Authoritarian (X_{11})	0.40	2.49
Authoritative (X_{12})	0.43	2.30
Permissive (X_{13})	0.39	2.54
Interpersonal Communication Needs (X_{15})	0.06	6.66
Kill Time (X_{16})	0.12	8.36
Reflect Personality (X_{17})	0.08	2.97
Entertainment (X_{18})	0.09	1.73
Lower 1 hours (X_{20})	0.47	2.13
1-2 Hours (X_{21})	0.48	2.08
3-4 Hours (X_{22})	0.79	1.27
5-6 Hours (X_{23})	0.42	2.35

Table 4: The factors affecting mobile phone addiction among Chinese middle school students had Tolerance between 0.06 and 0.79 which did not exceeded 3 and VIF between 1.26 and 8.36 which did not exceeded 10. The table shows that Tolerance and VIF had consistency, which could summarize the factors affecting mobile phone addiction among Chinese middle school students, not collinearity.

Table 5 Multiple regression analysis of the factors affecting mobile phone addiction among Chinese middle school students (n=1,342)

The Factors Affecting	b	SE	β	t	p
Sex (X_1)	0.32	0.04	0.25	8.78*	.00
Age (X_2)	0.05	0.01	0.09	3.34*	.00
GPA 0.00-1.50 (X_3)	0.62	0.06	0.45	10.67*	.00
GPA 1.51 - 2.50 (X_4)	0.56	0.05	0.44	10.26*	.00
GPA 2.51 - 3.50 (X_5)	0.76	0.06	0.48	12.72*	.00
Eldest Child (X_7)	0.34	0.05	0.26	7.04*	.00
Middle Child (X_8)	0.31	0.05	0.20	5.88*	.00
Youngest Child (X_9)	0.13	0.06	0.09	2.36*	.02
Authoritarian (X_{11})	0.13	0.05	0.10	2.75*	.01
Authoritative (X_{12})	0.26	0.06	0.16	4.56*	.00
Permissive (X_{13})	0.19	0.05	0.14	3.86*	.00
Interpersonal Communication Needs (X_{15})	-0.11	0.12	-0.09	-0.91	.36
Kill Time (X_{16})	-0.15	0.13	-0.08	-1.22	.22
Reflect Personality (X_{17})	0.09	0.12	0.06	0.75	.46
Entertainment (X_{18})	-0.09	0.12	-0.06	-0.75	.45
Lower 1 hours (X_{20})	0.10	0.05	0.07	2.04*	.04
1-2 Hours (X_{21})	-0.16	0.05	-0.11	-3.42*	.00
3-4 Hours (X_{22})	0.92	0.08	0.28	10.88*	.00
5-6 Hours (X_{23})	0.18	0.05	0.12	3.38*	.00
(Constant)	1.21	0.28	-	4.34*	.00

Note: *p<.05

R = 0.55 R^2 = 0.30 R^2_{adj} = 0.29 F=30.10 df= 19,1322 p<0.01

Table 5: : Multiple regression Analysis of factors affecting mobile phone addiction among Chinese middle school students had significantly at .05 levels (F=30.10, df=19,1322, p<0.01). It showed that sex (X_1), age (X_2), GPA 0.00-1.50 (X_3), GPA 1.51-2.50 (X_4), GPA 2.51-3.50 (X_5), eldest child (X_7), middle child (X_8), youngest child (X_9), authoritarian (X_{11}), authoritative (X_{12}), permissive (X_{13}), interpersonal communication needs (X_{15}), kill time (X_{16}), reflect personality (X_{17}), entertainment (X_{18}), lower 1 hours (X_{20}), 1-2 hours (X_{21}), 3-4 hours (X_{22}), and 5-6 hours (X_{23}) could predict 29 percent variation of mobile phone addiction.

General factors affecting mobile phone addiction among Chinese middle school students had significant relationships at .05 level in descending order as follows:

GPA 2.51-3.50 (X_5) had the highest standard score in linear regression of 0.48; GPA 0.00-1.50 (X_3) had the standard score in linear regression of 0.45; GPA 1.51-2.50 (X_4) had the standard score in linear regression of 0.44; sex (X_1) had the standard score in linear regression of 0.25; and age (X_2) had the lowest standard score in linear regression 0.09.

Family factors affecting mobile phone addiction among Chinese middle school students had significant relationships at .05 level in descending order as follows: eldest child (X_7) had the highest standard score in linear regression of 0.26; middle child (X_8) had the standard score in linear regression of 0.20; authoritative (X_{12}) had the standard score in linear regression of 0.16; permissive (X_{13}) had the standard score in linear regression of 0.14; authoritarian (X_{11}) had the standard score in linear regression of 0.10; and youngest child (X_9) had the lowest standard score in linear regression of 0.09.

Mobile phone use factors affecting mobile phone addiction among Chinese middle school students had significant relationships at .05 level in descending order as follows: 3-4 hours (X_{22}) had the highest standard score in linear regression of 0.28; 5-6 hours (X_{23}) had the standard score in linear regression of 0.12; lower 1 hours (X_{20}) had the standard score in linear regression of 0.07; and 1-2 hours (X_{21}) had the

standard score in linear regression of -0.11; except that interpersonal communication needs (X_{15}), kill time (X_{16}), reflect personality (X_{17}), and entertainment (X_{18}) had not significantly at .05 levels.

  Summary: When sex (X_1), age (X_2), GPA 0.00-1.50 (X_3), GPA 1.51-2.50 (X_4), GPA 2.51-3.50 (X_5), eldest child (X_7), middle child (X_8), youngest child (X_9), authoritarian (X_{11}), authoritative (X_{12}), permissive (X_{13}), reflect personality (X_{17}), and lower 1 hour (X_{20})–increased the mobile phone addiction. On the other hand, interpersonal communication needs (X_{15}), kill time (X_{16}), entertainment (X_{18}), and 1-2 hours (X_{21}) decreased the mobile phone addiction.

  Therefore, the equations predict affecting of mobile phone addiction among of Chinese students are written as follows:

  Equation Predict Raw Score

  $Y = 1.21(\text{Constant}) + 0.32\,X_1 + 0.05\,X_2 + 0.62\,X_3 + 0.56\,X_4 + 0.76X_5 + 0.34X_7 + 0.31\,X_8 + 0.13\,X_9 + 0.13\,X_{11} + 0.26\,X_{12} + 0.19\,X_{13} - 0.11\,X_{15} - 0.15\,X_{16} + 0.09\,X_{17} - 0.09\,X_{18} + 0.10\,X_{20} - 0.16\,X_{21} + 0.92\,X_{22} + 0.18\,X_{23}$

  Equation Predict Standard Score

  $ZY = 0.25\,X_1 + 0.09\,X_2 + 0.45\,X_3 + 0.44\,X_4 + 0.48\,X_5 + 0.26\,X_7 + 0.20\,X_8 + 0.09\,X_9 + 0.10\,X_{11} + 0.16\,X_{12} + 0.14\,X_{13} - 0.09\,X_{15} - 0.08\,X_{16} + 0.06\,X_{17} - 0.06\,X_{18} + 0.07\,X_{20} - 0.11\,X_{21} + 0.28\,X_{22} + 0.12\,X_{23}$

CHAPTER 5

CONCLUSION, DISCUSSION AND RECOMMENDATION

5.1 Conclusion

This study used the Chongqing Agricultural School as a case study in order to study the factors correlating to mobile phone addiction among middle school students and investigate the factors affecting mobile phone addiction among middle school students.

The target population of this study was the middle school students at Chongqing Agricultural School. The sample group consisted of 1342 middle school students at the school. With the use of a questionnaire given to the intended target population, this study used a quantitative analytic technique to collect data. Prior to questionnaire distribution, assessments of content validity and reliability were conducted. The level of mobile phone addiction among middle school students and the factors influencing mobile phone addiction were assessed using the Pearson Product-Moment Correlation Coefficient and Multiple Regression Analysis.

The research results could be summed up as follows based on the statistical analysis's findings:

5.1.1 Correlations between factors and mobile phone addiction among Chinese middle school students.

In examining the correlation between general factors and mobile phone addiction, positive correlation coefficients between 0.06 and 0.26 were identified. Notably, **sex** X_1 exhibited the highest positive correlation at 0.26, suggesting a noteworthy influence on mobile phone addiction. Conversely, **age** X_2 demonstrated the lowest positive correlation (0.06), indicating a relatively weaker association. Surprisingly, **GPA 3.51-4.00** X_6 revealed a negative correlation (-0.25), implying a potential protective effect against mobile phone addiction among high-achieving students.

For the family factors, positive correlation coefficients ranging from 0.08 to 0.09 were observed. **Authoritarian parenting** X_{11} displayed the highest positive

correlation (0.09), hinting at a potential link between stricter parenting styles and mobile phone addiction. On the contrary, **eldest child** X_7 status showed the lowest positive correlation (0.08), suggesting a comparatively weaker association. Noteworthy negative correlations were identified for **only child** X_{10} status and **uninvolved parenting** X_{14}, indicating a potential protective influence against mobile phone addiction.

The examination of mobile phone use factors uncovered positive correlation coefficients between 0.05 and 0.26. **Spending 3-4 hours on the phone** X_{22} displayed the highest positive correlation (0.26), suggesting a robust association with increased addiction. **Entertainment-related phone use** X_{18} also exhibited a positive correlation (0.05), emphasizing its role in contributing to mobile phone addiction. In contrast, **spending 1-2 hours on the phone** X_{21} demonstrated a negative correlation (-0.11), suggesting a potential moderation effect on mobile phone addiction. **Kill time** X_{16} displayed the lowest negative correlation (-0.06), implying a mild protective effect against mobile phone addiction.

5.1.2 **Factors affecting mobile phone addiction among Chinese middle school students.**

After confirming the factors affecting mobile phone addiction among Chinese middle school students, they had Tolerence between 0.06 and 0.79, which did not exceed–3, and VIF between 1.26 and 8.36, which did not exceed 10. The multiple regression analysis was applied to investigate the factors affecting mobile phone addiction among Chinese middle school students.

The results reveal significant influences of various predictive factors, including gender X_1, age X_2, GPA categories (X_3, X_4, X_5), birth order variables (X_7, X_8, X_9), parenting styles (X_{11}, X_{12}, X_{13}), and mobile phone usage patterns (X_{20}, X_{21}, X_{22}, (X_{23})), on mobile phone addiction. While interpersonal communication needs (X_{15}), kill time (X_{16}), reflect personality (X_{17}), and entertainment (X_{18}) had no significant influence on mobile phone addiction. Variations in these independent variables explained 29 percent of the observed variability in the dependent variable (mobile phone addiction) based on statistical analysis.

To be specific, general factors influencing mobile phone addiction among Chinese middle school students demonstrated significant relationships at the level of 0.05, arranged in descending order as follows: GPA 2.51-3.50 (X_5) exhibited the highest standard scores in linear regression, with a value of 0.48. GPA 0.00-1.50 (X_3) had a standard score in linear regression of 0.45, and GPA 1.51-2.50 (X_4) had a standard score in linear regression of 0.44. Sex (X_1) had a standard score in linear regression of 0.25, and age (X_2) displayed the lowest standard score in linear regression of 0.09.

Family factors also significantly influencing mobile phone addiction among Chinese middle school students exhibited relationships at the significance level of 0.05, ranked in descending order as follows: Eldest child (X_7) had the highest standard score in linear regression at 0.26, followed by the middle child (X_8) with a standard score in linear regression of 0.20. Authoritative parenting (X_{12}) showed a standard score in linear regression of 0.16, permissive parenting (X_{13}) had a standard score in linear regression of 0.14, authoritarian parenting (X_{11}) exhibited a standard score in linear regression of 0.10, and the youngest child (X_9) displayed the lowest standard score in linear regression of 0.09.

Moreover, mobile phone use factors significantly influencing mobile phone addiction among Chinese middle school students exhibited relationships at the 0.05 significance level, ranked in descending order as follows: Except for interpersonal communication needs (X_{15}), kill time (X_{16}), reflect personality (X_{17}), and entertainment (X_{18}), which did not show significant influence at the 0.05 level, the factors were ranked from high to low based on standard scores in linear regression.

Spending 3-4 hours on the phone (X_{22}) had the highest standard score in linear regression of 0.28, followed by 5-6 hours (X_{23}) with a standard score in linear regression of 0.12. Lower 1 hour (X_{20}) had a standard score in linear regression of 0.07, and 1-2 hours (X_{21}) had a standard score in linear regression of 0.11.

Regarding the impacts of independent variables on mobile phone addiction, both positive and negative effects were considered. The variables such as

sex (X_1), age (X_2), GPA 0.00-1.50 (X_3), GPA 1.51-2.50 (X_4), GPA 2.51-3.50 (X_5), eldest child (X_7), middle child (X_8), youngest child (X_9), authoritarian parenting (X_{11}), authoritative parenting (X_{12}), permissive parenting (X_{13}), reflect personality (X_{17}), and lower 1 hour of phone use (X_{20}) were associated with an increase in mobile phone addiction. Conversely, a decrease in factors like interpersonal communication needs (X_{15}), kill time activities (X_{16}), entertainment-related phone use (X_{18}), and spending 1-2 hours on the phone (X_{21}) were associated with a decrease in mobile phone addiction.

The equation of predict raw score and standard score were as follows:

The Equation of Predict Standard Score

$$Y = 1.21 \text{ (Constant)} + 0.32\,X_1 + 0.05\,X_2 + 0.62\,X_3 + 0.56\,X_4 + 0.76\,X_5 + 0.34\,X_7 + 0.31\,X_8 + 0.13\,X_9 + 0.13\,X_{11} + 0.26\,X_{12} + 0.19\,X_{13} - 0.11\,X_{15} - 0.15\,X_{16} + 0.09\,X_{17} - 0.09\,X_{18} + 0.10\,X_{20} - 0.16\,X_{21} + 0.92\,X_{22} + 0.18\,X_{23}$$

The Equation of Predict Standard Score

$$ZY = 0.25\,X_1 + 0.09\,X_2 + 0.45\,X_3 + 0.44\,X_4 + 0.48\,X_5 + 0.26\,X_7 + 0.20\,X_8 + 0.09\,X_9 + 0.10\,X_{11} + 0.16\,X_{12} + 0.14\,X_{13} - 0.09\,X_{15} - 0.08\,X_{16} + 0.06\,X_{17} - 0.06\,X_{18} + 0.07\,X_{20} - 0.11\,X_{21} + 0.28\,X_{22} + 0.12\,X_{23}$$

5.2 Discussion

Based on the results of the data analysis, the discussion on the results was as follows:

5.2.1 The correlation between independent variables and mobile phone addiction

The significant positive correlation between sex and mobile phone addiction may imply that one gender is more likely to be at risk for mobile phone addiction among Chinese secondary school students. This may be influenced by social interactions, usage habits, or psychological differences between genders and warrants further study. Moreover, the results showed that students with higher GPAs (GPA 3.51-4.00) were negatively correlated with mobile phone addiction, while students with lower GPAs (GPA 0.00-1.50; 2.51-3.50) were positively correlated with mobile phone addiction. This

finding may reflect the fact that high GPA students are more academically focused, have better self-control, and are therefore less likely to be affected by mobile phone addiction. On the contrary, students with lower GPAs may face problems such as academic stress and a lack of motivation to study and are more likely to fall into mobile phone addiction. This is consistent with the findings of Sunday and others (2021), who found that students who demonstrated better performance in their academics indicated that they had high levels of concentration and self-regulation, helping to avoid mobile phone addiction.

In the study, it was found that the eldest child was positively correlated with mobile phone addiction, while the only child was negatively correlated with mobile phone addiction. These two correlations may reflect the different pressures and influences that children in different positions in the family may face. Older children often bear greater expectations from parents, who anticipate them to be more responsible. This implicit pressure may inadvertently contribute to stress, and the desire to escape such pressure could potentially lead to mobile phone addiction. This is in line with research by Csibi and others (2021), which discovered that some addiction-related aspects of mobile phone use were more prevalent across age groups. Because of this, the addictive aspects associated with mobile phone use show unique trends among various age groups. Conversely, only children may be more likely to receive parental attention and support, helping to reduce the risk of mobile phone addiction. The study also found that authoritarian parenting was positively correlated with mobile phone addiction, while uninvolved parenting was negatively correlated with mobile phone addiction, a finding that may reflect the different effects of different styles of parenting on adolescents' mobile phone use behavior. This aligns with the findings of Budiarti and others (2022), where they observed that an authoritative parenting style has a 70% probability of causing moderate mobile phone addiction in children and a 29% probability of leading to severe addiction. For authoritarian parenting, there may be stricter family rules and restrictions, resulting in adolescents being more likely to fall into mobile phone addiction as they seek independence and escape from constraints. In

such cases, teens may outwardly seek to socialize more outside the home, thus reducing the frequency of mobile phone use.

For the mobile phone use factors, the results indicate a positive correlation between the long duration of mobile phone usage and the likelihood of mobile phone addiction and a negative correlation between the short duration of mobile phone usage and the likelihood of mobile phone addiction. This is consistent with the findings of Parasuraman and others (2017), where they discovered that prolonged or excessive mobile phone usage may lead to behavioral alterations and induce addictive behavior. This suggests that as the time spent using a mobile phone increase, the association with mobile phone addiction becomes stronger.

Moreover, the researcher found a positive correlation between entertainment and reflecting personality, and mobile phone addiction, while interpersonal communication needs and time-killing activities exhibit a negative correlation. This pattern may suggest varying motivations and psychological needs influencing individual mobile phone usage. The positive correlations with entertainment and reflecting personality imply a greater likelihood of individuals becoming engrossed in seeking stimulation or expressing themselves through their phones. Xiong and others' (2021) findings also align with this observation. The entertainment aspect of mobile phones provides students with additional opportunities to regulate their emotions. Mobile phone addiction is largely attributed to the pleasure students derive from entertainment activities, contributing significantly to this phenomenon. Abd Rahim and others (2021) additionally discovered that numerous studies indicate a correlation between mobile phone addiction and the personality traits of mobile phone users, particularly those who are extroverted and introverted. Conversely, the negative correlations with interpersonal communication needs and time-killing activities may suggest that individuals are more inclined to reduce their dependence on phones when fulfilling social needs or engaging in other meaningful activities. They also confirmed that young people who prefer interpersonal communication and seek activities to kill time tend to be more extroverted and less prone to mobile phone addiction than

introverts. These results underscore the significance of psychological motivations in shaping mobile phone usage behaviors and addictive tendencies, providing valuable insights into the mechanisms underlying mobile phone addiction.

5.2.2 The influence of independent variables on mobile phone addiction

For the general factors, the results of multiple regression analysis revealed that all of the general factors significantly contribute to mobile phone addiction among Chinese middle school students. GPA emerged as a key determinant, with relatively high standard scores observed. This suggested a positive impact of academic performance on mobile phone addiction. This is consistent with the findings of Rathakrishnan and others (2021), where the study revealed that higher levels of mobile phone addiction were associated with lower academic performance among university students. Additionally, gender exerted a significant influence on mobile phone addiction, albeit to a lesser extent than GPA. The impact of age was relatively weak, suggesting that mobile phone addiction may manifest across various age groups. Horwood and others (2021) also supported the idea that children of all ages are prone to mobile phone addiction.

For the family factors, the analysis indicated birth order had a significant influence on mobile phone addiction. Specifically, the eldest child had the highest influence on mobile phone addiction, and the middle child ranked second. The youngest child, on the other hand, displayed the lowest standard score in linear regression. This implies a comparatively weaker influence on mobile phone addiction. This finding aligns with Hawi and Samaha's (2021) suggestion that older children may experience different parenting styles and expectations, potentially impacting their mobile phone usage patterns. The researcher also looked into factors pertaining to trends in mobile phone usage. The amount of time spent using a mobile phone each day was found to be a major factor; 3–4 hours of usage was linked to the highest standard scores. This implies that students who use their phones more frequently are more likely to become addicted to anything. Interestingly, a negative standard score was seen after 1-2 hours of consumption, suggesting that there may be a threshold

below which the risk of addiction declines. Gangadharan and others (2022) noted in their study that the average time dedicated to mobile phone usage was notably elevated among individuals with addiction. Ge et al. (2015) also corroborated the findings of this study, suggesting that additional activities diverting individuals' attention from mobile phones could contribute to a reduction in the prevalence of mobile phone addiction. According to the Chongqing Compulsory Education Academic Quality Testing Social Edition Report released by the Chongqing Education Quality Monitoring Center in 2020, specifically, students who spend only 0.5 hours a day on their mobile phones five days a week generally have better test scores than those who spend more than three hours a day, up by 108 points. The same is true on weekends or holidays, where students who spend one hour a day on their mobile phone rather than three hours score significantly higher on average, with an advantage of at least 50 points (Chongqing Daily, 2021).

5.3 Recommendation

    5.3.1 Practical recommendations

        Based on the results of this study, educational philosophers and school principals can draw insights to prevent or counteract mobile phone addiction among middle school students.

        Educational philosophers play a vital role in situating the findings of this study within broader educational principles. They can analyze how the identified correlations between smartphone addiction, academic performance, and family dynamics align with educational philosophies. By considering the equilibrium between academic achievement and student well-being, philosophers can offer valuable insights into the ethical dimensions of smartphone usage in educational settings. Additionally, policymakers in education can use this research to formulate comprehensive policies and guidelines addressing the societal implications of smartphone addiction. The study's implications may instigate policy-level discussions on devising strategies that align with educational objectives while promoting a healthy learning environment.

        As primary decision-makers in educational institutions, school principals and administrators have the opportunity to implement practical measures derived from

the research. By integrating strategies to address smartphone addiction into the overall framework for student well-being and academic success, they can establish an environment that supports both educational goals and students' mental health. These leaders play a crucial role in translating research insights into actionable policies, ensuring the educational institution embraces a holistic perspective on students' smartphone usage.

Furthermore, teachers, educational support staff, and parents can also derive benefits from the research findings.

Teachers, being at the forefront of student interaction, can directly apply the research findings in their classrooms. With an understanding of how mobile phone addiction may affect students academically, teachers can develop strategies to address these challenges on an individual or class level.

Educational support staff, including counselors and psychologists, can incorporate the research into their interventions, offering targeted support to students displaying signs of mobile phone addiction and collaborating with parents to address underlying psychological factors.

Parents, as the primary influencers of a child's behavior, can significantly benefit from the research insights. By comprehending the impact of birth order, parenting styles, and academic performance on mobile phone addiction, parents can establish healthy technology habits at home and engage in effective communication with their children about responsible phone use.

To address the issue of mobile phone addiction among Chinese secondary school students, a number of practical recommendations may be made based on the perceptive results and discussions offered in the preceding sections.

Firstly, it is necessary to create intervention programs that are specifically suited to the demands and obstacles experienced by all sexes, given the considerable positive link that has been shown between sex and addiction to mobile phones. These initiatives can concentrate on comprehending and reducing the social, psychological, and usage habit variables that lead to sex disparities in mobile phone addiction.

Secondly, given the inverse relationship between a high GPA and a mobile phone addiction, educational establishments have to think about offering academic assistance services to students with lower GPAs. These programs can deal with problems including motivational deficits, stress related to school, and other elements that lead to dependency on mobile phones.

Thirdly, the study found relationships between parenting philosophies, mobile phone addiction, and birth order. It is suggested to hold parenting classes, which can assist parents in comprehending the possible influence of their children's mobile phone usage due to factors such as birth order and parenting methods. Reducing the danger of mobile phone addiction can be achieved in part by offering advice on how to create a stable and harmonious home environment.

Finally, both parents and students must be made aware of the possible dangers of excessive phone use, especially in light of the link between the length of phone use and addiction. Awareness-raising efforts might emphasize the value of striking a balance between screen time and other activities, promoting responsible usage, and establishing reasonable daily phone usage limitations.

5.3.2 Recommendations for further studies

1) In order to fully understand the dynamic nature of addiction to mobile phones, a follow-up study needs to be conducted. Through long-term follow-up, researchers may investigate the progression of mobile phone addiction and its association with factors like birth order, gender, and GPA. This follow-up study reveals possible turning points and crucial adolescent times, providing a nuanced view of the developmental trajectory of cell phone addiction.

2) Future research on the cross-cultural subtleties of addiction to mobile phones should take geography, cultural norms, and ethnic background into account. Through comparative studies conducted across multiple geographies and ethnic groups, researchers may investigate the validity of the relationships between independent variables and dependence on mobile phones in different cultural contexts.

3) Future research can also adopt a grade-level perspective to understand how mobile phone addiction evolves throughout different stages of education. By conducting a comprehensive analysis across elementary and high school grades, researchers can identify patterns and variations in mobile phone usage and addiction risk.

4) This study, focusing on the factors influencing mobile phone addiction among middle school students, was grounded in quantitative analysis for deriving results. Future research endeavors may consider integrating qualitative research methodologies into the study design. Qualitative insights give a more comprehensive understanding of the elements leading to mobile phone addiction by placing the data correlations in context. Researchers can reveal complex viewpoints, cultural influences, and emotional qualities that may be missed by using quantitative measurements alone by probing into people's lived experiences.
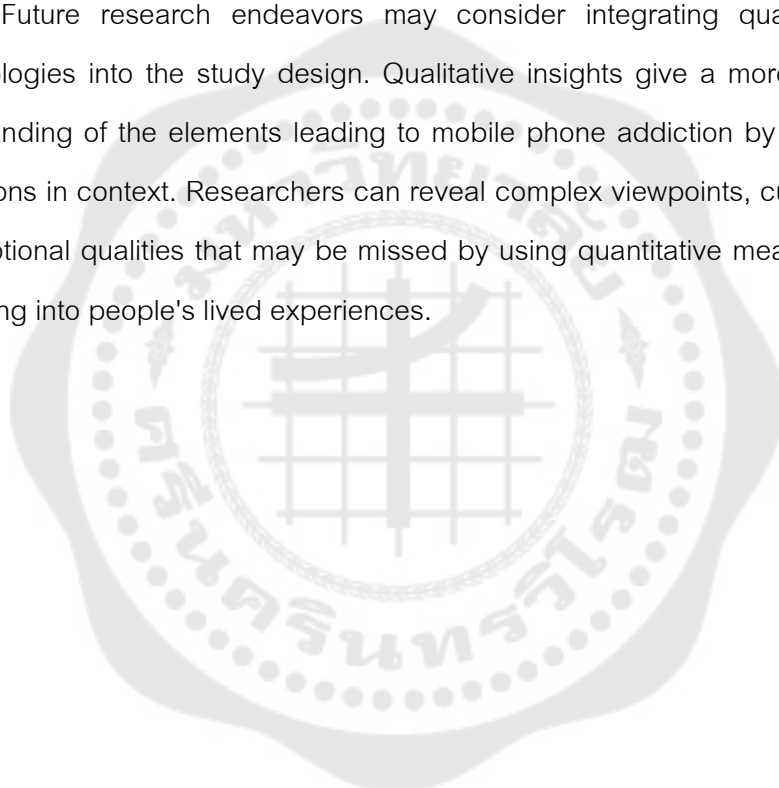
REFERENCES

Abd Rahim, N. A., Siah, Y. H., Tee, X. Y., & Siah, P. C. (2021). Smartphone addiction: Its relationships to personality traits and types of smartphone use. *International Journal of Technology in Education and Science*, *5*(1), 128–140.

Abu Bakar, M. F., Mohd Yusoff, S. S., Abdul Rahman, R., & Idris, N. S. (2021). The prevalence of smartphone addiction and its association with parenting styles among secondary school students in Kota Bharu, Kelantan. *International Medical Journal*, *28*(5), 542-546.

Abuhamdah, S. M. A., & Naser, A. Y. (2023). Smartphone addiction and its mental health risks among university students in Jordan: A cross-sectional study. *BMC Psychiatry*, *23*, 812.

Alolaywi, Y. (2021). Teaching online during the COVID-19 pandemic: Teachers' perspectives. *Journal of Language and Linguistic Studies*, *17*(4), 2022-2045.

American Psychological Association (APA). (n.d.). *Substance use, abuse, and addiction. American Psychological Association*. Retrieved 12, December 2023 from https://www.apa.org/topics/substance-use-abuse-addiction

Aminu, M., & Timothy, J. (2014). Career choice and academic performance of Microbiology students in a Nigerian university. *International Journal of Science and Technology Educational Research*, *5*(5), 58-66.

Bağcı, H., & Pekşen, M. F. (2018). Investigating the Smart Phone Addictions of Vocational School Students from Different Variables. *Malaysian Online Journal of Educational Technology*, *6*(4), 40–52.

Bhardwaj, P. (2019). Types of Sampling in Research. *Journal of the Practice of Cardiovascular Sciences*, *5*, 157-163.

Bianchi, A., & Phillips, J. G. (2005). Psychological predictors of problem mobile phone use. *Cyberpsychology & Behavior*, *8*(1), 39–51.

Budiarti, A., Sustrami, D., & Febriani, V. (2022). The correlation between parenting styles

and smartphone addiction among primary school students in Indonesia. *International Journal of Nursing and Midwifery Science (IJNMS)*, *6*(1), 96-102.

Chen, B., Liu, F., Ding, S., Ying, X., Wang, L., & Wen, Y. (2017). Gender differences in factors associated with smartphone addiction: A cross-sectional study among medical college students. *BMC Psychiatry*, *17*, 341.

Chen, S. E. (2022). Current status of smartphone addiction among middle school students and correction strategies. *Teaching and Educating*, *25*, 4-6.

Ching, K. H., & Hong, L. M. T. (2017). The structural model in parenting style, attachment style, self-regulation, and self-esteem for smartphone addiction. *IAFOR Journal of Psychology & the Behavioral Sciences*, *3*(1), 85-103.

Choi, Y. K., & Lee, S. (2015). *Understanding Mobile Phone Usage through a Value-Based Approach: Marketing Implications*. IGI Global.

Chongqing Daily (2021, December 1). *Chongqing Compulsory Education Academic Quality Testing Social Edition Report*. Retrieved from https://www.cq.gov.cn/zwgk/zfxxgkml/zdlyxxgk/shgysy/jy/202112/t20211201_10061025.html

Csibi, S., Griffiths, M.D., Demetrovics, Z., & Szabo, A. (2021). Analysis of Problematic Smartphone Use Across Different Age Groups within the 'Components Model of Addiction'. *International Journal of Mental Health and Addiction, 19*(3), 616–631.

Damiao, J., & Cavaliere, C. (2021). The relationship between smartphone addiction and academic performance in college students. *Global Journal of Health Science*, *13*(9), 10-15.

Ezemenaka, E. (2013). The usage and impact of Internet-enabled phones on academic concentration among students of tertiary institutions: A study at the University of Ibadan, Nigeria. *International Journal of Education and Development using Information and Communication Technology (IJEDICT)*, *9*(3), 162-173.

Gangadharan, N., Borle, A. L., & Basu, S. (2022). Mobile phone addiction as an emerging behavioral form of addiction among adolescents in India. *Cureus*, *14*(4), e23798.

Gao, Y., Wang, J., Zhao, T., & Jiang, S. (2023). Current status of smartphone addiction and correction strategies among middle school students. *Psychological Monthly*, *4*, 79-81+84.

García, Z. B., & Mendez, Z. A. (2013). *What is Smartphone*. IGI Global.

Ge, R. K., Zhong, X. M., & Chen, R. (2015). Influence of exercise intervention on mobile phone dependence in university students. *Modern Preventive Medicine*, *42*(21), 3919–3921.

Guinee, K., & Mertz, G. (2015). *Mobile Phone Use by Middle School Students*. IGI Global.

Han, D., & Qi, Z. (2005). Psychological analysis of mobile phone addiction among college students. *Contemporary Youth Research*, (12), 34-38.

Hashmi, K. (2022). Adolescence and Academic Well-being: Parents, Teachers, and Students' Perceptions. *Journal of Education and Educational Development*, *9*(1), 27–47.

Hawi, N. S., & Samaha, M. (2016). To excel or not to excel: Strong evidence on the adverse effect of smartphone addiction on academic performance. *Computers & Education*, *98*, 81–89.

Hawi, N. S., & Samaha, M. (2017). Relationships among smartphone addiction, anxiety, and family relations. *Behaviour & Information Technology*, 36(10), 1046–1052.

Horwood, S., Anglim, J., & Mallawaarachchi, S. R. (2021). Problematic smartphone use in a large nationally representative sample: Age, reporting biases, and technology concerns. *Computers in Human Behavior*, *122*, 106848.

Jeong, J.-H., & Bae, S.-M. (2021). The relationship between types of smartphone use, digital literacy, and smartphone addiction in the elderly. *Psychiatry Investigation*, *18*, 832-839.

Joy, D. (2023). Examining the relationship between personality and smartphone addiction among college students. *International Journal of Progressive Research in Engineering Management and Science (IJPREMS)*, *3*(8), 126–132.

Li, D., Xu, Y., & Cao, S. (2023). How does trait mindfulness weaken the effects of risk factors for adolescent smartphone addiction? A moderated mediation model.

Behavioral Sciences, *13*(4), 540.

Li, Z. (2018). Over-reliance on mobile phones: A comprehensive analysis of its impact on physical and mental health. *Journal of Behavioral Sciences*, *15*(3), 245-259.

Lian, L., You, X., Huang, J., & Yang, R. (2016). Who overuses smartphones? Roles of virtues and parenting style in smartphone addiction among Chinese college students. *Computers in Human Behavior*, *65*, 92–99.

Liang, A., & Yang, B. (2010). Exploring the Nexus of Smartphone Addiction and Youth: A Comprehensive Study. *Journal of Technology and Behavioral Science*, *8*(2), 112-125.

Liang, Y., Liu, X., Tu, L., & Li, C. (2023). Investigation and research on smartphone addiction among junior high school students. *Statistics and Management*, *9*, 25-31.

Liu, H., Novotný, J. S., & Váchová, L. (2022). The effect of mobile phone addiction on perceived stress and mediating role of ruminations: Evidence from Chinese and Czech university students. *Frontiers in Psychology*, *13*, 1057544.

Liu, J., Yu, X., Kong, L., & Zhou, X. (2023). Prevalence and factors associated with smartphone addiction among nursing postgraduates during the COVID-19 pandemic: A multilevel study from China's mainland. *BMC Psychiatry*, *23*, 915.

Moattari, M., Moattari, F., Kaka, G., Kouchesfahani, H. M., Sadraie, S. H., et al. (2017). Smartphone Addiction, Sleep Quality, and Mechanism. *International Journal of Cognitive and Behavioral Practice*, *1*(1), 002.

Moser, C. (1993) *Gender Planning and Development: Theory, Practice, and Training*. Routledge: London, UK.

Munasinghe, P. G. (2016). Factors influencing smartphone addiction among students of the North Central Province in Sri Lanka. *In Proceedings of Annual Bangkok Business and Social Sciences Research Conference, Ambassador Hotel, Bangkok, Thailand* (pp. 1-10).

Nancy, D. (1999). *Parenting Style and Its Correlates*. ERIC Clearinghouse on Elementary and Early Childhood Education Champaign IL.

Parasuraman, S., Sam, A. T., Yee, S. W. K., Chuon, B. L. C., & Ren, L. Y. (2017).
Smartphone usage and increased risk of mobile phone addiction: A concurrent
study. *International Journal of Pharmaceutical Investigations*, *7*(3), 125–131.

Park, Y., & Lee, S. (2022). Gender differences in smartphone addiction and depression
among Korean adolescents: Focusing on the internal mechanisms of attention
deficit and self-control. *Computers in Human Behavior*, *136*, 107400.

Paulhus, D. (2008). Birth order. Encyclopedia of Infant and Early Childhood Development.

Prasittichok, P., Sripairote, T., & Trisri, S. (2023). Causal factors affecting the smartphone
addiction of Generation Z in Bangkok during the COVID-19 pandemic. *Humanities,
Arts and Social Sciences Studies*, *23*(2), 394–405.

Pu, S., Li, C., Qiu, S., & Dai, L. (2022). Family influence and prevention of mobile phone
addiction tendency in junior high school students. *Journal of Guangdong Second
Normal College*, *42*(1), 50-57.

Rathakrishnan, B., Bikar Singh, S. S., Kamaluddin, M. R., Yahaya, A., Mohd Nasir, M. A.,
Ibrahim, F., & Ab Rahman, Z. (2021). Smartphone addiction and sleep quality on
academic performance of university students: An exploratory research.
International Journal of Environmental Research and Public Health, *18*(16), 8291.

Raut, P. (2021, August 18). *Smartphone addiction for teens; signs, causes, effects, and
solution*. Retrieved from https://www.linkedin.com/pulse/smartphone-addiction-
teens-signs-causes-effects-solution-raut

Sahu, M., Gandhi, S., & Sharma, M. K. (2019). Mobile phone addiction among children and
adolescents: A systematic review. *Journal of Addictions Nursing*, *30*(4), 261-268.

Sanghi, S. (2022). Age as a site of law's meaning-making practices. *Jindal Global Law
Review*, *13*, 221–229.

Shi, J. G. (2009). Mobile phone dependence syndrome. *Clinical Psychiatry*, *19*(2),
138-139.

Song, F. (2022). The impact of smartphone addiction on junior high school students and
coping strategies. *Beijing Education (General Education Edition)*, *8*, 73-74.

Sunday, O. J., Adesope, O. O., & Maarhuis, P. L. (2021). The effects of smartphone

addiction on learning: A meta-analysis. *Computers in Human Behavior Reports*, *4*, 100114.

Thyne, D., & Anhaus-Brey, D. (n.d.). *A Guide to Education & International Schools in China. Internations*. Retrieved 13 June, 2023 from https://www.internations.org/china-expats/guide/education

Tian, X., Xiang, H., & Wang, Y. (2017). Gender differences in internet addiction among college students. *Sichuan Mental Health*, *1*, 67-70.

Wang, X. (2022). The era locked in the smartphone screen: Causes and countermeasures of smartphone addiction among middle school students. *Primary and Secondary School Mental Health Education*, *35*, 75-77.

Wu, Y.-Y., & Chou, W.-H. (2023). Smartphone addiction, gender, and interpersonal attachment: A cross-sectional analytical survey in Taiwan. *Digit Health*, *9*, 20552076231177134.

Xiong, S., Xu, Y., Zhang, B., Zhu, L., & Xie, J. (2021). Smartphone addiction and Eysenck's personality traits among Chinese adolescents: A meta-analysis. *Frontiers in Psychology*, *12*, 794112.

APPENDIX

APPENDIX A

IOC OF QUESTIONNAIRE

Item Objective Congruence for questionnaire

Rate +1, if the item clearly matches the stated objectives.

Rate 0, if the item is unclear or unsure whether the measures meet the stated objectives.

Rate -1, if the item does not clearly match the stated objectives.

Part 1 General information (11 questions)

No.	Item Test No.	Expert 1	Expert 2	Expert 3	Average	Congruence
1.	What is your gender? ☐ Male ☐ Female ☐ LGBTQ+	+1	+1	+1	+1	Congruent
2.	What level of secondary education are you in? ☐ Grade 1 ☐ Grade 2 ☐ Grade 3	+1	+1	+1	+1	Congruent
3.	What was your cumulative grade point average? ☐ 0 – 1.50 ☐ 1.51- 2.50 ☐ 2.51 - 3.50 ☐ 3.51- 4.00	+1	+1	+1	+1	Congruent
4.	Where do you live? ☐ City ☐ Rural	+1	+1	+1	+1	Congruent

Part 1 General information (11 questions) (Cont.)

5.	What was your birth order? ☐ Eldest child ☐ Middle child ☐ Youngest child ☐ Only child	+1	+1	+1	+1	Congruent
6.	What was your family structures? ☐ Complete families ☐ Single-parent families ☐ Remarried families ☐ Families of left-behind children ☐ Orphans	+1	+1	+1	+1	Congruent
7	What was your parent's parenting style? ☐ Authoritarian ☐ Authoritative ☐ Permissive ☐ Uninvolved	+1	+1	+1	+1	Congruent
8	What is your average monthly expense? ☐ <400 yuan ☐ 401 - 650 yuan ☐ 651 - 900 yuan ☐ 901 – 1,1500 yuan ☐ > 1,1501 yuan	+1	+1	+1	+1	Congruent

Part 1 General information (11 questions) (Cont.)

9	What are the top 3 mobile phone functions that you use most? ☐ call ☐ send text messages (including MMS) ☐ with the mobile phone photography ☐ Use your mobile phone for entertainment, such as watching movies, listening to music, playing games. ☐ use the mobile phone to surf the Internet ☐ use the mobile phone to read e-books	+1	+1	+1	+1	Congruent
10	What is your biggest motivation for using a mobile phone? ☐ interpersonal communication needs ☐ kill time ☐ reflect personality ☐ entertainment ☐ study or work needs	+1	+1	+1	+1	Congruent

Part 1 General information (11 questions) (Cont.)

11	What is the average daily time of mobile phone use? ☐ < 1 hours ☐ 1 - 2 hours ☐ 3 - 4 hours ☐ 5 - 6 hours ☐ > 6 hours	+1	+1	+1	+1	Congruent

Part 2: Survey on student mobile phone addiction (15 questions)

|						
1	When I wake up in the morning, the first thing I do is pick up my cell phone. (-)	+1	+1	+1	+1	Congruent
2	If I don't use my mobile phone for a week, I can't stand it. (-)	+1	+1	+1	+1	Congruent
3	If I don't have my mobile phone, I feel bad. (-)	+1	+1	+1	+1	Congruent
4	You often use your mobile phone for longer than intended. (-)	+1	+1	+1	+1	Congruent
5	you feel pain wrist or neck while using a cell phone. (-)	+1	+1	+1	+1	Congruent
6	If you don't check your phone messages for a while, you will feel irritated. (-)	+1	+1	+1	+1	Congruent

Part 2: Survey on student mobile phone addiction (15 questions) (Cont.)

7	You will feel restless every time if you don't have a mobile phone at hand (-)	+1	+1	+1	+1	Congruent
8	You will always miss your mobile phone even when you are not using it. (-)	+1	+1	+1	+1	Congruent
9	You can't concentrate on your studies because of using your mobile phone. (-)	+1	+1	+1	+1	Congruent
10	Your friends and family complain that you use your cell phone all the time. (-)	+1	+1	+1	+1	Congruent
11	You argue with your parents or family members about the cost of your cell phone. (-)	+1	+1	+1	+1	Congruent
12	You try to spend less time on your mobile phone. (+)	+1	+1	+1	+1	Congruent
13	It's hard to turn your phone off. (-)	+1	+1	+1	+1	Congruent

Part 2: Survey on student mobile phone addiction (15 questions) (Cont.)

14	When you feel lonely, you will use your mobile phone to chat with others. (+)	+1	+1	+1	+1	Congruent
15	When you feel in a bad mood, you will play your mobile phone to improve your mood. (+)	+1	+1	+1	+1	Congruent
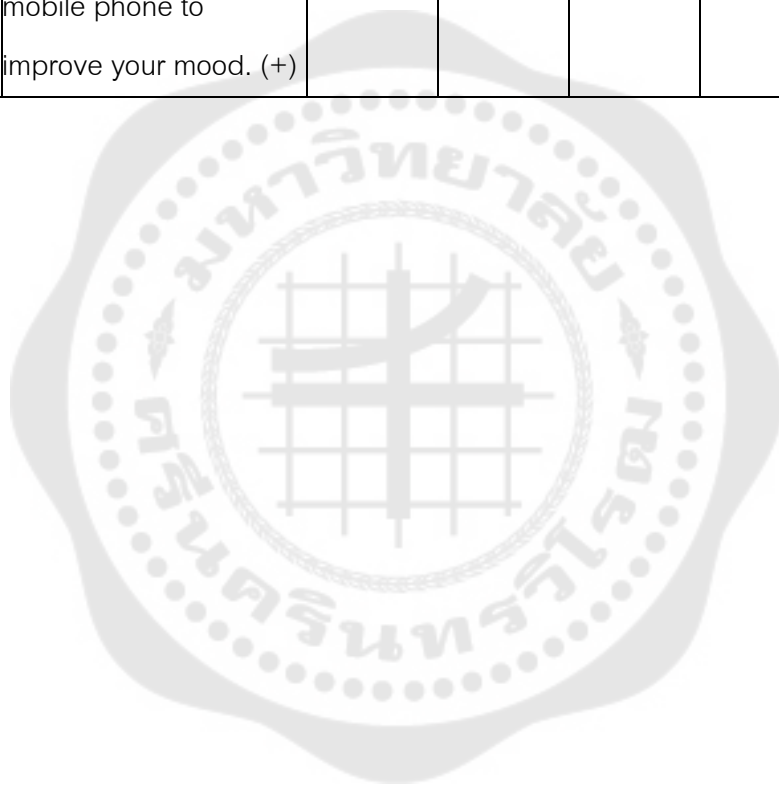
APPENDIX B

QUESTIONNAIRE

Factors that influence mobile phone addiction among Chinese middle school students

Survey on student mobile phone addiction

Explanation: Responding to the Mobile Phone Addiction Survey.

1.This Mobile Phone Addiction Survey is for educational purposes only. which is part of the Master's degree program Department of Educational Psychology and Guidance Faculty of Education Srinakharinwirot University

2. Students' answers will be helpful and of great importance to the study. and further research

3. The students' answers are neither right nor wrong. Therefore, the researcher would like to ask for help from Students, please answer the survey truthfully. and corresponds to the idea students' feelings the most

4. Various information that students answered It will be considered confidential and will not cause any harm to the student.

5. The survey is divided into 2 parts. Please answer all questions. Because if you do not answer all questions, this survey will not be able to analyze the research results.

The researcher would like to thank all students for their cooperation in answering the survey and providing assistance in this research.

Mengya Xia

Researcher

Part 1 General information (12 questions)

Instructions: Please mark √ in the box in front of the statement that corresponds to the student's reality.

1. What is your gender?

☐ Male   ☐ Female   ☐ LGBT

2. What level of secondary education are you in?

☐ Grade 1   ☐ Grade 2   ☐ Grade 3

3. What was your cumulative grade point average?

☐ 0 – 1.50   ☐ 1.51 - 2.50   ☐ 2.51 - 3.50   ☐ 3.51 - 4.00

4. Where do you live?

☐ City ☐ Rural

5. What was your birth order?

☐ Eldest child   ☐ Middle child   ☐ Youngest child   ☐ Only child

6. What was your family structures?

☐ Complete families

☐ Single-parent families

☐ Remarried families

☐ Families of left-behind children

☐ Orphans

7. What was your parent's parenting style?

☐ Authoritarian ☐ Authoritative ☐ Permissive ☐ Uninvolved

8. What is your average monthly expense?

☐ <400 yuan

☐ 401 - 650 yuan

☐ 651 - 900 yuan

☐ 901 – 1,1500 yuan

☐ > 1,1501 yuan

9. What are the top 3 mobile phone functions that you use most?

☐ call

☐ send text messages (including MMS)

☐ with the mobile phone photography

☐ Use your mobile phone for entertainment, such as watching movies, listening to music, playing games.

☐ use the mobile phone to surf the Internet

☐ use the mobile phone to read e-books

10. What is your biggest motivation for using a mobile phone?

☐ interpersonal communication needs

☐ kill time

☐ reflect personality

☐ entertainment

☐ study or work needs

11. What is the average daily time of mobile phone use?

☐ < 1 hours

☐ 1 - 2 hours

☐ 3 - 4 hours

☐ 5 - 6 hours

☐ > 7 hours

Part 2: Survey on student mobile phone addiction (15 questions)

Instructions: Please mark √ in the box in front of the statement that corresponds to the student's reality. Please read the following sentences carefully and choose the number that most matches your situation

Topic	Rarely	Occasionally	Sometimes	Often	Always
	1	2	3	4	5
1. When you wake up in the morning, the first thing you do is pick up my cell phone.(-)					
2. If you don't use my mobile phone for a week, you can't stand it. (-)					
3. If you don't have my mobile phone, you feel bad. (-)					
4. You often use your mobile					

phone for longer than intended. (-)				
5. you feel pain wrist or neck while using a cell phone. (-)				
6. If you don't check your phone messages for a while, You will feel irritated. (-)				
7. You will feel restless every time. If you don't have a mobile phone at hand. (-)				
8. You will always miss your mobile phone even when you are not using it. (-)				
9. You can't concentrate on your studies because of using your mobile phone. (-)				
10. Your friends and family complain that you use your cell phone all the time. (-)				
11. You argue with your parents or family members about the cost of your cell phone. (-)				
12. You try to spend less time on your mobile phone. (+)				
13. It's hard to turn your phone off. (-)				

14. When you feel lonely, you will use your mobile phone to chat with others. (+)					
15. When you feel in a bad mood, you will play your mobile phone to improve your mood. (+)					

VITA

NAME   Xia MengYa

DATE OF BIRTH   September 7th,1989

PLACE OF BIRTH   Chongqing,China

HOME ADDRESS   No. 3, Constellation, Group 8, Longhu u City, No. 29, Daxue

City West Road, Huxi Street, Shapingba District, Chongqing,

China