

Intergenerational Differences in Mobile Phone Addiction Between Elderly Migrants and Adolescents: A Grounded Theory Study

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Abstract

With the penetration and popularity of mobile phones among the elderly and adolescents, the problem of mobile phone addiction has become a new focus of academic attention. To explore the characteristics of mobile phone addiction and its inter-generational differences between elderly migrants and adolescents, this study uses the grounded theory and constructs a generational difference theory model. The study found that mobile phone addiction in elderly migrants addicts are prone to consume because they fear "withdrawing" from the world. However, adolescents' addiction is the product of "entering the new world to create", and they believe that they can control the online world at the cognitive level, while the elderly say they cannot completely "deal with" it. In addiction dependence, "emotional" dependence is basic need for elderly migrants, while the youth are "functionally" dependent. In addition, mobile phone addiction will deepen inter-generational conflicts. Interestingly, elderly migrant often compromises to avoid conflicts. The inter-generational difference model of mobile phone addiction characteristics between different groups proposed in this study will provide a reference for targeting media literacy education and promoting inter-generational harmony.

Keywords: Mobile Phone Addiction, The Elderly Migrants, Adolescents, Emotional Dependence, Grounded Theory

Introduction

"Mobile phone addiction" is not a new social problem but a new symptom of "Internet addiction" set in the rapid development of mobile Internet technology. As early as the 1980s, Sherry Turkle was concerned that new technologies could be so sticky that people could not break away from their dependence on them (Turkle, 2014). In recent years, mobile phones have become the most dominant device for people to access the Internet due to their independent operating system and running space, convenience and portability (Chou and Chou, 2019). However, the more ubiquitous and powerful mobile phones are, the harmful

effects of "mobile phone addiction" penetrate deeply into different aspects. According to the "Research Report on Internet Access Behavior of Middle-aged and Older People in 2021" published by Imedia Consulting(2021), 51% of middle-aged and older people spend more than four hours online each day and using mobile phones day and night becomes a daily routine; more than 9.9% of minor Internet users spend more than two hours online per capita on weekdays(CYL and CNNIC, 2020).

Of China's 244 million migrant population, more than 13 million are elderly, of which 43% choose to migrate to care for their younger generations (UNFPA and Unicef, 2018). Due to this group's environmental and cultural incompatibility, social interaction and interpersonal conflicts have become social problems that cannot be ignored (Mu, 2017). Social interaction is a basic need of human beings. Elderly migrants devote much time to various new social media platforms to seek newly attached human relations and obtain social support(Wang and Zhang, 2022). 2

Problem Statement

Although scholars have examined the causes of mobile phone addiction in older adults, the existing studies in intergenerational family relationships are insufficient to provide a complete understanding (Zhou and Xie, 2021). Intergenerational differences may lead to diverse characteristics of mobile phone addiction in different generational groups, which may reflect the problem within the family system (Chen and Fei, 2010). Therefore, this grounded theory study plan to extract the characteristics of mobile phone addiction of elderly migrants and adolescents, and then explore and analyze the intergenerational differences in mobile phone addiction between the two groups.

Limitations

This grounded theory study is only an exploratory study and still has shortcomings. First of all, considering the adequacy of previous research on adolescent mobile phone addiction, this study collected secondary data on the topic of "characteristics of adolescent mobile phone addiction," which is likely to affect the analysis results; Second, due to the epidemic, this study interviewed older adults on the Internet lacking timely feedback interactions and on-site observation details, which may also affect data quality.

Literature Review

Media use and generational differences

Intergenerational differences are group characteristics that vary significantly across generations regarding values, emotional preferences, cognition, and behavior, influenced by birth years and upbringing (Xue et al., 2018). At present, Chinese society is facing an increasingly "new" media and an increasingly "old" population structure. Population aging is becoming increasingly severe. Different generations were being called "digital natives" and "digital immigrants" by Mike Prensky because of the differences in the timing and skill level of their access to media technology. Although the values and attitudes of different groups and generations are presented and debated in the new media, the expanding media have brought about "implosion"-like social changes, resulting in the subversion, challenge, and even rupture of otherwise stable social relations such as ethical relations and power structures (Zhou, 2015; Zhou, 2016). Scholars study intergenerational differences mainly focusing on intergenerational differences in media use behavior, the proximate use of different types of media, and the motivation of media use. Intergenerational differences in

media use behavior primarily manifest in specific media preferences and participation. Variation in media usage across different types of media reflects individual inclinations towards particular media platforms. Additionally, disparities in motivation for media consumption examine psychological needs and overall satisfaction with media engagement.

The most fruitful results on intergenerational differences in media use behavior (Shuanglong and li, 2008; Zhu, 2015a). Several studies have confirmed intergenerational differences in media use behaviors, especially online media use. A survey of cloud services across Spain found that teenagers have more significant needs than seniors for cloud service storage space and privacy protection. At the same time, older users are more sensitive to the security experience of cloud services (Bordonaba-Juste et al., 2020). Zhao (2019b) found that the post-70s lagged behind the post-80s and post-90s across the board regarding information acquisition, online dating, and online expression, which may be caused by the short time the post-70s spending on the Internet. It has also been found that the "liking" behavior of the post-70s is mainly to improve communication, while the post-90s are both improving and avoiding communication (Chen and Shao, 2018). In addition, there are also intergenerational differences in the use of web buzzwords, with the use of web buzzwords by the children's generation being significantly higher than that of the parents' generation, and after in-depth analysis, it was found that the parents' generation mainly use buzzwords that are more widely spread and accepted (Li, 2014).

Scholars have also researched the use of different media types, with different generations showing other service habits under the double line of a media development cycle and audience life cycle. A Swedish research study shows that the older generation tends to use traditional media, while the new generation embraces social media more actively (Ghersetti and Westlund, 2018). There are behavioral differences across generations, even when faced with the same social media (Zhao, 2019a). Younger generations focus on showing themselves on social platforms, are active and creative, and are willing to try new social software; older adults have conservative attitudes and mainly obtain information about useful services like health and weather information (Wang and Wang, 2018a).

In addition, a few studies examine different generations' motivations for using social media, focusing primarily on audience media use and gratification. Scholars have found significant generational differences in media use on socialized trust (Xue et al., 2018). However, data from a survey of 10 European countries showed that levels of media trust did not differ between generations (Brosius et al., 2021). Other studies have found that the same medium does not bring about the same need satisfaction. For example, there are no generational differences in using Facebook and blogs to satisfy social and emotional needs. Still, there are generational differences in selfish motivation (Leung, 2013).

Mobile phone addiction and generational differences

We are living in an addictive era, where addiction caused by excessive mobile phone use has a significant negative impact on the physiological and psychological well-being of individuals. While research in this area began in 2008 with the introduction of mobile phones, it was in 2014 that the real focus of scholars was placed on it. Wang and Wang (2018b) reviewed that the study of mobile phone addiction mainly focus on the adolescent group, and it needs to expand the research population further.

Studies have found that mobile phone addiction not only affects adolescents' physical and mental health (Arrivillaga et al., 2020; Zhang et al., 2019) and academic achievement (Yan et al., 2018; Samaha and Hawi, 2016) but also leads to adolescents' frustrated interpersonal relations in real life and social interactions (Shen, 2018; Zhang and Sun, 2015), and can even induce adolescents to form a criminal mentality and inclination towards crime (Wang, 2007). Several scholars have empirically demonstrated that gender, personality traits, anxiety depression, self-efficacy, and social support of adolescents can predict mobile phone addiction (Wang et al., 2015; Liu et al., 2014; Huang et al., 2021; Zhou et al., 2015; Ge and Zhu, 2014); others have used mobile phone addiction as a predictive variable to explore the relationship between mobile phone addiction and sleep quality (Zhu, 2015b; Liu et al., 2017a), academic achievement (Nie, 2014, Liu et al., 2017b) and physical activity (Zhu, 2017). Compared to mobile phone addiction research in adolescents, there is a lack of research on mobile phone addiction in older age groups. Vasiliu et al (2017) noted that it is crucial to differentiate the characteristics of addictive behaviors in different subjects due to differences in age, culture, and experience. A study of mobile phone users aged 18 to 70 found that mobile phone addiction had a more significant negative impact on younger people than older adults (Kim et al., 2018).

In summary, along with the increasing popularity of digital survival, research on media use focusing on different generations is emerging in China, and many research results on youth mobile phone addiction have been accumulated. Still, few studies have explored the characteristics of mobile phone addiction from the perspective of intergenerational differences. Even studies on mobile phone addiction focusing on older groups are still limited to empirical descriptions (Duan and LV, 2020). Peng Lan pointed out that the difference in digital survival between generations will also increase the intergenerational cultural gap and even lead to cultural rupture (Peng, 2020a). This study will undoubtedly enrich the existing research results. It will not only help to guide the "healthy existence" of different generations in digital space but also provide a reference for relevant governing bodies to carry out media literacy education, bridge intergenerational cultural differences, and promote intergenerational harmony.

Research Objectives

1. To study the characteristics of mobile phone addiction in the elderly migrants.
2. To explore the characteristics of mobile phone addiction in the adolescents.
3. To examine the differences in the characteristics of mobile phone addiction between these two groups?

Research Questions

This study will to answer these questions

1. What are the characteristics of mobile phone addiction in the elderly migrants?
2. What are the characteristics of mobile phone addiction in the adolescents?
3. What are the differences in the characteristics of mobile phone addiction between these two groups?

Research Methodology

The grounded theory method was initially proposed by Barney Glaser and Anselm Strauss. Grounded theory is not a "theory" but rather an alternate, comparative, interactive, and

hypothetical inference approach that allows for using multiple sources for research (Corbin and Strauss, 2015). It is recognized as the most scientific type of qualitative research (Timmermans and Tavory, 2012). It emphasizes bottom-up induction of concepts and propositions from information in natural contexts and the theoretical construction of socially specific phenomena (Liu and Zhang, 2019). This study aimed to investigate the intergenerational differences in the characteristics of mobile phone addiction and to develop a preliminary theoretical construction of the intergenerational differences in the parts of mobile phone addiction. Therefore, this study used grounded theory to code primary interview data and secondary literature (e.g., research papers, reports, news, and other texts) step by step.

The study was concluded by open Coding, axial Coding, and selective Coding of interview materials and collected secondary sources based on the formulation of questions and systematic literature review, and only after passing the theoretical saturation test. In the open coding stage, the selected texts were coded and categorized after repeatedly deliberating word by word and sentence by sentence; in the axial coding stage, the categories from the open coding stage were again summarized, and the main categories were refined; finally, the main types were organically related to examining the latent pattern, and for this purpose, the theoretical paradigm of "A (condition) → B (phenomenon) → C (environment) → D (action/interaction and its strategy) → E (consequence)" Wu and Li (2020) is outlined, and the theoretical model of intergenerational differences in the characteristics of mobile phone addiction is explored, and interpreted and compared by repeatedly comparing the collected data and sorting out the "storyline". Considering that this study is to explore the intergenerational differences in the characteristics of mobile phone addiction, we will not construct a selective code for each group separately but will compare the concepts and categories extracted from the study on the two groups to form a standard theory that is applicable.

Data Sources

This study focused on the core issue of "mobile phone addiction" in these two groups. The primary data selected for the study of "mobile phone addiction" among elderly migrants were in-depth interviews conducted with people aging 60 years and above who had symptoms of mobile phone addiction. The selection criteria for mobile phone addiction were mainly based on the self-assessment of the elderly and other assessments by their family members, such as mobile phone use for 5 hours or more per day. Through purposive sampling, eight interviewees were finally selected in this study, who are now living with older people in Chengdu, Nanjing, Xining, and Yinchuan in China. The interviews were conducted through face-to-face and online discussions (WeChat voice calls) to understand their awareness of mobile phones, mobile phone use, and the influences of mobile phones on their life. The interviews were conducted from November 2021 to February 2022, with a single interview lasting about 30 minutes. Secondary data include authoritative media reports such as Guangming Daily and China Youth Daily and some reports, totaling 23 documents (Table 1).

Table 1

Selected sample of news reports, data reports

Type of Literature	Literature Name	Literature Sources
Press release	Why are there more and more "Internet-addicted seniors"? Report on the Internet life of older adults: some people may suffer from Internet loneliness, online for more than ten	Xinhua YICAI
Press release	hours a day	Guangming
Press release	Older adults also have "Internet addiction" What to do	Daily Xinhua
Press release	Why are silver-haired people addicted to brushing their phones? Focus on Internet-addicted elderly "three senses." 2021 Research Report on Middle-aged and Older People's	Daily Telegraph
Report	Internet Access Behavior	imedia

As mentioned in the previous section, scholars have studied mobile phone addiction among adolescents, and this study is intended to compare the intergenerational differences in the characteristics of mobile phone addiction, so the data on mobile phone addiction among adolescents were mainly selected from the research literature on the Internet. Because the concept of mobile phone addiction is used interchangeably with mobile phone dependence, cell phone addiction, Internet addiction, and problematic mobile phone use, the above-mentioned similar concepts were also included in the literature search in the CNKI(Chinese National Knowledge Infrastructure) database. The papers were indexed and included in CSSCI. By searching all CSSCI source literature published before January 1, 2022, after removing duplicate articles, a total of 65 research articles highly related to the study topic were selected by manual screening.

The study randomly selected two interview transcripts of older adults and 15 pieces of adolescent mobile phone addiction research papers for further theoretical saturation testing. Based on its principle, theoretical saturation was considered to be reached when the information could not be generalized to new concepts or relations.

Data Analysis

Open Coding

Open coding reviews textual information word by word, tagging keywords, and then summarizes them, which is the first stage of conceptualization (Wu and Li, 2020). In the open coding stage of the characteristics of adolescent mobile phone addiction, out of 65 documents related to this topic, 50 were randomly selected for classification and reorganization, labeling, summarization, and coding, and 243 original event records were compiled based on objective judgment and comprehensive understanding, and were conceptualized classification. Because of the homogeneity of many research hypotheses in the knowledge-based literature, this study invited academic experts to integrate, compare, screen, and label the actual events, conceptual understanding, and determination of categories and finally formed 63 initial concepts. Twenty categories were developed after re-clustering by judging these concepts' correlation, similarity, subordination, or causality (Table 2).

Table 2

Concepts and categories of open coding of adolescent mobile phone addiction

Initial Category	Initial Concept	Initial Category	Initial Concept
A1 Inappropriate family parenting	a1 Rough parenting	A2 Complex schooling environment	a6 Stressful study
	a2 Family indulgence		a7 Different majors
	a3 Behavioral role models		a8 Lots of free time
	a4 Low parent-child interaction		a9 Controlled by arrangement
	a5 Disregard for psychological needs		a10 Exam-oriented education
A3 Developed mobile phone applications	a12 Many functions close to daily life	A4 Inadequate government regulation	a11 No positive praise
	a13 Humanized design		a16 The system is vulnerable
	a14 Handy to carry		a17 Lack of green mobile phone culture
	a15 Concealment of the induction method		
A5 Promoted by capital	a18 Operators offer deals	A6 Being in the adolescent stage	a20 Self-identity establishment period
	a19 Developers cater to user needs		a21 Inner Rebellion
A7 Individual trait differences	a22 Emotional instability	A8 Emotional and social needs	a26 Showing oneself and maintain a social network
	a23 High neuroticism		a27 Communicating emotions and building social relationships
	a24 Perfectionist tendency		
	a25 Affected by life events		
A9 Escape from negative emotions	a28 Escape from reality	A10 Information Needs	a30 Coping with Social Uncertainty
	a29 Relieve negative emotions		a31 Coping with Information Uncertainty
A11 Entertainment needs	a32 Excessive focus on mobile entertainment	A12 Addictive Preferences	a34 Preference for information
	a33 Pursuit of pleasure and personal comfort		a35 Preference for Entertainment
			a36 Prefer social
A13 Usage habits	a38 Ritualized mobile phone use	A14 Wrong self-perception	a37 Enthusiastic about program updates
	a39 Use during school activities or classes		a41 Negative self-awareness
			a42 Lack of meaning in life

	a40 Use at home while doing homework		
A15 Wrong world perception	a43 Internet is good a44 Reality sucks	A16 Positive mobile phone perception	a45 Meaningful cultural symbols a46 Giving positive emotional feedback a47 Fashionable lifestyle a48 Achieving high efficiency in work and study a49 Improve efficiency in life
A17 Not good for physical and mental health	a50 Affects sleep a51 Affects mood a52 Disrupts the balance of brain chemistry a53 Affects personality independence	A18 Not conducive to academic performance	a54 Academic burnout a55 Difficulty concentrating a56 Lack of independent thinking a57 Poor verbal skills
A19 Not conducive to interpersonal harmony	a58 Weakening interpersonal skills a59 Outbreak of intergenerational conflict a60 Distancing of family relationships	A20 Not conducive to future development	a61 Influences on future career a62 Hindering the training of reserve talents in society a63 Toward the path of crime

Based on the same idea and operation procedure, 23 pieces secondary papers and 6 primary interview transcripts were compiled on the issue "What are the characteristics of mobile phone addiction of elderly migrants," 182 prior event records were obtained, and 44 initial concepts and 17 categories were proposed after further abstraction and categorization (Table 3).

Table 3

Concepts and categories of open coding of mobile phone addiction among elderly migrants

Initial Category	Initial Concept	Initial Category	Initial Concept
A1 Family support with a focus	a1 Low family emotional support	A2 Social support is improving	a4 Policy support increased
	a2 More family material support		a5 Grassroots organizations support
	a3 No active support for mobile phone use skills		a6 Enterprises respond to national policies

A3	Mobile applications are highly targeted	a7 Accurate mobile phone algorithm recommendation a8 More forced advertising a9 Spam application plug-in download	A4 Individual life characteristics	a10 High impact of life events a11 Difficult environmental integration
A5	Being in the life cycle of old age	a12 Childlike curiosity and desire to explore a13 Decreased physical function	A6 Emotional needs	a14 Maintaining social networks a15 Expanding new social networks
A7	Information needs	a16 Concern for national and social development a17 Responding to social interaction	A8 seeks spiritual support	a18 Relieving negative emotions a19 Finding spiritual support
A9	Entertainment needs	a20 Pursuit of pleasure a21 Satisfying hobbies	A10 Addiction preference	a22 Prefers information a23 Prefers entertainment a24 Prefers social reaction a25 Prefers mobile apps a26 Prefers positive value-oriented content
A11	Usage habits	a27 Regular schedule a28 Receiving information passively a29 Browse more than create a30 Community is the primary channel for content sharing	A12 Paradoxical perceptions	a31 Contradictory self-perception a32 Contradictory world perception
A13	Positive cell phone perception	a33 Tool attributes of mobile phones a34 Emotional attributes of mobile phones	A14 Not good for health	a35 Accelerates eye disease a36 Brings about sleep disorders a37 Induces cervical spondylosis
A15	High risk of being cheated	a38 Loss of funds	A16 Beneficial to mental health	a40 Feeling happy a41 Happiness has value

		a39 Gullible to insufficient information
A17 Facilitates family communication		a42 Adaptation of communication strategies a43 Increasing understanding a44 Starting a conversation

Axial Coding

The axial coding stage extracts the main categories based on inter-category relatedness and logic. In the open coding stage, the initial categories have been removed from the original text to ensure the categories' mutual exclusivity and rigor. However, to clarify the intergenerational differences in mobile phone addiction characteristics and present a clear and explicit model of mobile phone addiction characteristics, it is still necessary to deeply analyze the attributes of the categories and dig out the logical relationships among them. Therefore, in the axial coding stage, we further analyzed 20 categories of mobile phone addiction among adolescents and 17 categories of mobile phone addiction among elderly migrants and formed five main categories, which are: external environment, individual characteristics, cognitive characteristics, addiction motivation, and behavioral choice (Table 4). These five main categories can integrate the categories of addiction characteristics of elderly migrants and adolescents and are conducive to forming a unified theory.

Table 4

Axial codes of mobile phone addiction of elderly migrants and adolescents

Adolescents/Elderly Migrants	External Environment	Individual Characteristics	Cognitive Characteristics	Addiction Motivation	Behavioral Choice
Adolescents	Inappropriate family parenting style, Complex school education environment, Developed mobile phone technology applications	Being in adolescence; Individual physiological traits	Wrong self-perception, Wrong World Cognition, Positive mobile phone perception.	Emotional social needs, Escape from negative emotions, Information needs, Entertainment needs	Addictive Preferences Usage Habits

	Inadequate government regulation, Capital market hot pursuit.				
Elderly Migrants	Family support has a focus; Social support is improving; Mobile phone applications targeted.	Being in the life cycle of old age Individual Life Characteristics	Paradoxical cognition, Positive mobile phone cognition	Emotional Social needs, Information needs, Recreational needs, Seeking spiritual support	Addictive Preferences Usage Habits

Selective Coding

Selective coding is to analyze the main categories that have been summarized around the "initial categories," explore the internal connections and sort out a "storyline" (Gui and Zhong, 2021). In this study, the characteristics of mobile phone addiction among older adults and adolescents who have moved with them have been clearly identified: the external environment and personal characteristics provide the conditions for mobile phone addiction between the two groups; However, the differences in these conditions constitute cognitive differences and different intrinsic motivations of the two groups, and create other behavioral choice characteristics, which ultimately both lead to mobile phone addiction, and this consequence reverts to the two groups.

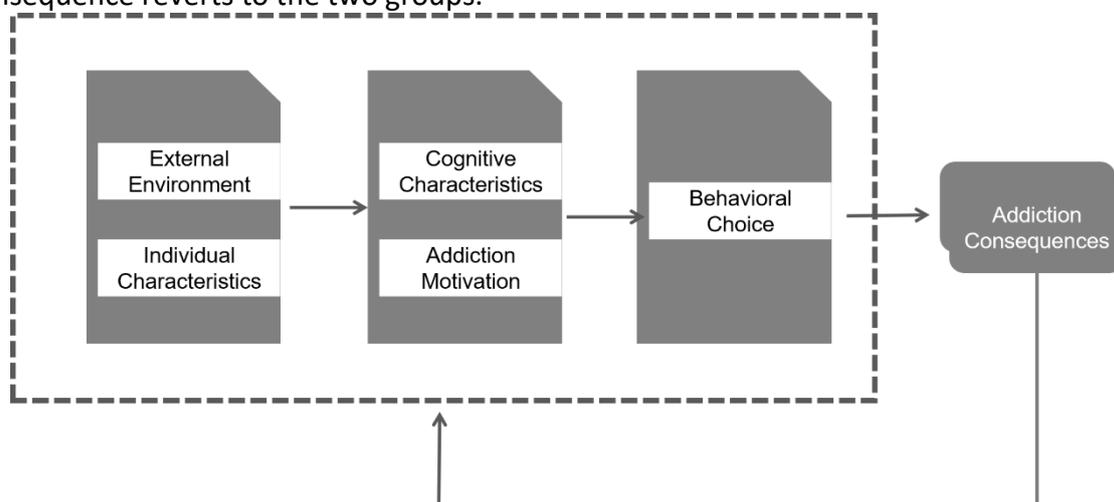


Figure 1: Model of mobile phone addiction characteristics of elderly migrants and adolescents

Saturation Test

To test the theoretical saturation of the mobile phone addiction characteristic model, we conducted saturation tests on the 2 original interview transcripts reserved under the topic of mobile phone addiction among elderly migrants accompanying and the 15 documents among adolescents, following the steps described previously for open coding, axial coding, and

selective coding in sequence, and the test is passed. The results show that the extracted main categories, initial categories, and relations portrayals are clear and abundant.

Finding and Conclusion

This study distils and summarizes the heterogeneity and homogeneity in the characteristics of mobile phone addiction in two groups, older migrant adults and adolescents, and then constructs a model of intergenerational differences in the characteristics of mobile phone addiction (Figure 2). Since this study explores the intergenerational differences in the characteristics of mobile phone addiction, the findings on the consequences of addiction are not discussed.

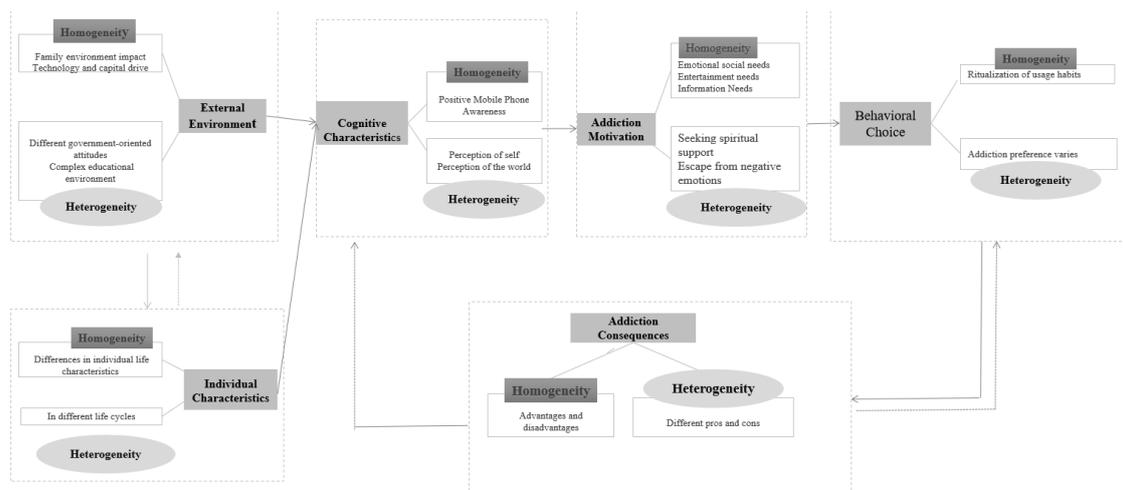


Figure 2: Comparison of intergenerational differences of mobile phone addiction

External environment and individual characteristics

From the "use and satisfaction" theory perspective, users' needs are determined by the external environment and personal characteristics (Liu, 2021). Mobile phone addiction of the two groups of people is strongly influenced by the family environment. Elderly migrants compensate in the mobile phone world because they "do not want to interfere with their children's work and study" or because of the lack of emotional support and "little communication" in their families. Teenagers, on the contrary, feel that they are studying for their parents' expectations because of the deficiency of "warmth" brought by parents' "roughness" and excessive "monitoring". They feel that they are studying for their parents' expectations and are bored with their phones. Both groups are deeply affected by life events, such as divorce of parents experienced by teenagers, and death of relatives and retirement experienced by the elderly. In addition, different personality traits of adolescents can significantly influence mobile phone addiction behavior. Still, the available data do not show how personality traits of older adults predict mobile phone addiction.

Mobile phone device manufacturers, network operators, and various software developers have created a social environment for mobile phone addiction, and they "make great efforts to cultivate young people into loyal players" by developing "playing games for points, providing phone credits, data traffic, and small gifts and benefits for games." Although the two groups are in different life cycles, they share the commonality of poor self-control and strong curiosity (Zhou et al., 2016), making them hard to resist and easy to become addicted. In addition, the government, as the main body of governance, has formulated different regulatory policies for them, such as to guide the elderly group to access digital life and enjoy

digital convenience. The government requires Internet enterprises to "upgrade their own APPs/small programs for aging", thus creating an "age-appropriate" environment, like creating the addictive conditions of "bigger fonts and simpler functions, more direct and comfortable to use". In contrast, the establishment of an "anti-addiction system for mobile games" among youth groups has become "inadequate in the establishment and implementation of the system" and "poorly supervised," resulting in "greatly reduced protection".

Cognitive Characteristics

The cognitive characteristics of mobile phone addiction among elderly migrants show contradictory perceptions of self and the world. They complain that they "always forget" and "have trouble hearing and seeing" in the face of drastic changes in their living and digital environments, and along with the promotion of "aging-friendly" products and applications, they often "defy ageism" and stereotypes (Yang and Pan, 2021). Meanwhile, they are confident that they can "learn by themselves" and think "it is easier to learn online".

On the one hand, older adults believe that society is full of "dishonesty", and they are afraid of being cheated and getting their children into trouble by interacting with others or even being "legally responsible"; on the other hand, they believe that the country is thriving, both in reality and online world. They believe the government is thriving and full of positive energy, the community and family are friendly and harmonious, and they have a positive attitude towards social e-commerce and money-making tasks. At the same time, the solid emotional dependence on "my mobile phone is my companion" also exacerbates mobile phone addiction among elderly migrants.

Compared to the cognitive characteristics of older adults, the cognitive characteristics of adolescents' mobile phone addiction include three categories: wrong self-perception, misguided worldview, and positive mobile phone perception, reflecting the adolescent group's overall perception of themselves, the world and the mediated world created by mobile phones, and the cognitive dissonance of themselves and the environment they live in is a critical factor in mobile phone addiction (Chen et al., 2018). Individual adolescents' "negative evaluations" of themselves, "lower levels of self-efficacy and self-esteem," and unclear self-concept predict high levels of addiction (Li et al., 2019). They argue that school is like a "badly designed game" and that only "the Internet can give what the real world cannot." In addition, adolescents have gradually moved from a spiritual dependence on mobile phones to show their "popularity" and "increase confidence" and "satisfaction" through virtual socialization to a "functional" support. "The mobile phone is a tool to make "shopping more convenient", "payment more efficient", "study more efficient", etc. The mobile phone also isolates parents and teachers, while can facilitates "private communication" between younger groups.

Addiction Motivation

Meeting the social and emotional needs, information needs, and entertainment needs are the core demands of elderly migrants. At the same time, technology empowerment is most fully reflected in the information empowerment level (Jiang et al., 2021). They are eager to keep up with news from their hometowns, and mobile phones help them easily cross spatial barriers and replicate their established social circles. They do this by video chatting with family and friends and browsing their friends' and colleagues' WeChat moments. At the same time, older adults fear being left behind and want to have "common topics" with their children.

Therefore, they prefer to read "current affairs news and care about national events." They also "listen to history" and "read mysterious martial arts novels" to satisfy their hobbies. They say they have no time for themselves during the day because they are trapped in the family, vegetable market, and kindergarten. At night, they "don't want to go to bed" and "feel that this is their own time," so they "endlessly browse Tiktok." It also shows that elderly migrants achieve a certain degree of self-certainty when they use mobile phones.

Social and emotional needs, information needs, and entertainment needs are also the primary motivation of adolescents. Adolescents "seek friends" and communicate with their peers on mobile phones, and after "gaining emotional support and comfort", they continue to strengthen their dependence on mobile phones. In addition, information satisfaction helps them "cope with social uncertainty," which significantly predicts the degree of mobile phone dependence (Lu et al., 2016). In addition, escaping from negative emotions is also the primary motivation for adolescents' mobile phone addiction. Mobile phones' games and entertainment functions are the best tools to eliminate negative emotions.

Behavioral Choice

The distinctive features of a highly mediated society make the media and real-life form an intertwined relationship, and people in the "mediated existence" are given a new way of living (Peng, 2020b).

This study found that mobile phone use among elderly migrants has formed a habit. On the one hand, they take their mobile phones as a tool to record "exercise data", sign to "receive coins", and "watch videos to earn money", and also to maintain or improve interpersonal communication.

They like "their sons' and daughters-in-law's WeChat moments whenever they see them" and "support their friends' requests." However, intergenerational cultural differences can lead to an "absence of presence" even under the same roof. Cultural isolation is another kind of imprisonment (Peng, 2021). In the interview, the elderly migrants said that when they go on holiday at the weekend, family members each brosing with their phones without communication. However, they also indulge in the accompanying time and space enjoyment brought by phones, "looking through headlines" in the morning, "browsing Tiktok" in the evening, and "almost all daily life on the mobile network". When doing housework opening short video apps, "listening to history broadcasts," or "watching the video to earn money", they find that "time passes quickly". In terms of information selection, they prefer entertainment content to have fun. They love "positive energy, social order, family ethics" and health care content. They are enthusiastic about national events and actively participate in the network to gain group identity. "Once I posted a comment about Liu Guoliang in my headline, more than 10,000 people liked me, and everyone agreed with me."

James Carey, in his discussion of the "ritual view of communication," emphasizes the role of communication as a "temporal sustainer of society" and an "expression of shared beliefs". In contrast to the elderly migrants, the adolescent group views the phone as a tool to express their self-identity and gain social status and influence among their peers. Despite academic pressures, their phone addiction was characterized by what James Carey describes as daily "practices". For example, they are online "when attending an event or class" and play games instead of doing homework. When they encounter academic problems, they will "find answers" on their phones first and even use QQ groups to copy answers from each other. Regarding addiction preferences, the youth group is fond of social software, games, videos,

and other apps, and they often play phone games, share moods and selfies through WeChat moments, and ask for "views" and "likes."

Intergenerational differences in mobile phone addiction

This study conceptualized and analyzed the characteristics of mobile phone addiction in two groups, the elderly migrants and the adolescents. It compared intergenerational differences in five dimensions: external environment, individual characteristics, cognitive characteristics, addiction motivation, and behavioral choices. The study results showed that the two groups were in their life stages, which led to significant differences in the environmental perceptions, dependency tendencies, preference types, behavioral choices, and resulting interpersonal relationships of mobile phone addiction (Table 5).

Table 5

Comparison of generational differences in mobile phone addiction

Characteristics	Elderly migrants	Adolescents
Individual life stages	Exclusion	Access
Network environment	Can't quite deal with	Controllable
Dependency tendencies	Emotional dependence	Functional dependency
Behavioral choices	Consumer	Creative
Online interpersonal relationships	Self-alone, "acquaintance"	Peer interaction, "new friends"
Offline interpersonal relationships	Solitary compromise	Lonely conflict

The cyber world has drawn up a new world picture, yet older adults are gradually withdrawing from the new world due to the decline of their physiological functions. Still, teenagers have a vigorous vitality and are eager to enter, explore and even transform the new world. The online world is unfamiliar to older adults and cannot be explained or fully "dealt with" empirically, but "everything is available online" makes it difficult for them to withdraw. Adolescents believe that the online world is "manageable" compared to real-world encounters and challenges, and this sense of accomplishment of being in control fuels phone addiction. At the same time, the elderly migrants, because of their late involvement in the digital world, have a strong sense of separation between the online world and the real world, and their dependence on phones is more like seeking "emotional dependence" and "spiritual support." But teenagers' sense of boundary between the natural world and the online world is blurred, and they survive here as a "functional dependency" that they cannot get rid of.

It is worth mentioning that although the behavioral preferences of mobile phone addiction are significantly different between the two groups, overall, their media literacy is still lacking. Media literacy has gradually become the ability to acquire and retrieve, understand and evaluate, create and share information, which is essential for citizens of a country (Unesco, 2013). The theoretical framework of new media literacy was divided into "basic media literacy," "critical media literacy," "creative media literacy," and "consumer media literacy" (Lin et al., 2013). In this study, adolescents preferred "creative" basic media skills, while older adults preferred "consumer" basic media skills. However, critical media literacy has always been an essential dimension of media literacy (Qu and Yu, 2022). Along with the renewal of the media environment and communication technology, the two groups lacking critical media literacy face the great challenge of living in a higher-mediated society.

Mobile phone addiction among elderly migrants and adolescents also profoundly impacts interpersonal relationships, as young people make new "strange" friends online and tend to interact with peers. Still, their offline interpersonal skills weaken, exacerbating interpersonal isolation and even causing serious conflicts with their families. The online interpersonal relationships of elderly migrants tend to be self-contained, and socialization is limited to "acquaintance" socialization. In offline interpersonal relationships, elderly migrants are also subject to their children's anger for playing with their phones. Their children think they set a "bad example" for their grandchildren. They often show a compromising attitude when dealing with family conflicts, but they also expect to "de-mobile" to communicate harmoniously with their children and grandchildren.

By conducting a grounded theoretical analysis of primary and secondary data, this study constructs a theoretical framework of the characteristics of mobile phone addiction among elderly migrants and adolescents. It compares the intergenerational differences in the characteristics of mobile phone addiction between the two groups, which expands the study of mobile phone addiction. The study found that older adults' phone addiction is based on "emotional" demands, while adolescents' addiction has gradually transitioned from "emotional" to "functional" dependence. In addition, due to the development stage of their life, the accessibility of the Internet, and the difference in their usage skills, the elderly group fears "quitting" the new world. Since they are not proficient in the basic usage skills of retrieval, uploading, and downloading. Therefore, they mainly rely on the pre-installed applications on mobile devices, and their behavior shows a passive "consumption type" lack of media literacy.

In contrast, the youth group tends to "enter" the new world "creatively" and enjoy a sense of control in the online world. They have basic media literacy but lack critical media literacy. Finally, mobile phone-addicted elderly migrants are lonely, but they usually choose to compromise to avoid family conflicts. At the same time, adolescents addicted to phones frequently cause family conflicts.

Recommendation

Future research can improve the interview design for adolescents; it can also deepen the comparative study of intergenerational differences and further expand the study population to explore the characteristics of mobile phone addiction among three generations of families; in addition, this study unexpectedly found that the consequences of addiction were not only differences between the two groups but also the older adults with mobile phone addiction had higher self-rated happiness. This finding needs to be confirmed by future research.

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