

# Is There a Barrier between Seniors and Smartphone Use in The Internet Age? A Study of Digital Disconnection among Older Adults

Ruotong Jiao \*

Jilin University, Department of Advertising, 2699 Qianjin Street, Chaoyang District, Changchun City, Jilin Province, China

**Abstract.** With internet and smartphone usage increasing every year, seniors are being exposed to digital media, either actively or passively. To help the elderly better integrate into the information society, clarifying the causes of their digital disconnection and developing appropriate solutions is essential. In this study, semi-structured interviews are utilized to investigate the self-adjustment and external intervention of the elderly in the age of digital media and to explore the ways, causes, and effects of digital disconnection of the elderly. The focus issue of this study is to clear the subjective and objective factors of digital disconnection, especially cognitive problems, group influences, and technological access barriers in the elderly population concerning digital devices and the Internet.

## 1. Introduction

With advancements in the national system, medical technology and economic development, China is stepping into population aging. The proportion of senior Internet users aged 60 and over was 11.3% as of June 2022, dropping 0.2% from the same period in the last years, according to *the 50th Statistical Report on Internet Development in China*, published in August 2022. Only 44% of senior citizens use the Internet, and some argue that aging and informatization are significant characters of contemporary era <sup>[1]</sup>.

The digital divide refers to a situation in which people of different genders, ages, and classes differ in their capability to access and use new information technologies, causing further inequalities <sup>[2]</sup>. This theory among older people works in three layers: accession, use and knowledge, and the three layers are progressively deeper. Limited knowledge and using skill gaps make it hard for older netizens to integrate into digital products and services <sup>[3]</sup>. What's more, the aging-friendly design of the Internet still deficient, leading some active seniors to withdraw.

However, there is few researches setting foot on the digital disconnect of the elderly. The empirical studies presented in this article are from explorative research, which used interviews as a context sample to investigate what dilemmas older netizens face and why they are in this predicament, especially in cognitive problems, group influences and technological access. Classifying this question would provide insight into their disconnect behaviors and propose workable solutions, which might also enhance the aging-friendly design.

## 2. Literature Review

### 2.1 A Study of The Subjective Factors of Digital Disconnect among Senior Citizens

First, physical and psychological issues shape elderly adults' Internet use. Physiological factors like reduced brain activity and weakened neuromodulatory control lead to negative learning in older people <sup>[4]</sup>. The elderly are concerned about privacy and security due to a lack of digital skills <sup>[5]</sup>. As for emotional motivation, such as the feeling seems like outsiders, the fear of trying new things and making mistakes may play a role in digital disconnection <sup>[6]</sup>. Furthermore, psychological age impacts older inhabitants' digital connections, the average age of them with media access is lower than those without connections <sup>[7]</sup>. Some seniors, old but young in mind, are willing to use digital media <sup>[8]</sup>. In addition, gender differences in the senior population also change digital media consumption. Research finds older female users are more tested to adapt to the use of new technologies <sup>[9]</sup> and their learning tendencies between older women and men are also different <sup>[10]</sup>. Thus, we may conclude that taking physical and psychological issues into account should be vital in promoting the senior population's digital connection.

Second, given the senior population's residential status, the family composition has a significant impact on the digital media access of the elderly <sup>[11]</sup>. When children become the main source of information and financial support for the elderly, their desire for digital feedback on the internet plays a crucial role <sup>[12]</sup>, in other words, the

\* Corresponding author: 1220912739@qq.com

living condition of the elderly group directly or indirectly affects the degree of digital media access through emotional factors [13].

Third, the degree of digital disconnect among the elderly is relative to education and financial status. For example, well-educated people use digital media more frequently than poor ones [14]. So with that, older adults who are informed have easier access to digital using digital media than others [15]. Low-income seniors are more prone to utilize digital media sparingly and carefully [16]. Lack of education, limited finances and an overwhelming fear of emerging technologies, all hinder seniors from having a great experience using digital media.

## 2.2 A Study of The Subjective Factors of Digital Disconnect among Senior Citizens

First, group and social factors are critical external factors in Internet use of older adults. They are disposed to use digital media in households with good access facilities [17]. If there are many household jobs, fewer patient relatives, or less energy to guide them, they would be reduced or even stop using the digital press [18]. Besides, the digital access of family and friends can affect the choice of older adults [19]. The social circle of the elderly is unfamiliar with digital media, which may be short in external access motivation. Regarding social factors, inadequate social support is also an apparent cause of digital disconnection [20]. The development of regional economies and information societies also act on the distribution of digital media resources and social ideas and shape older people's use.

Second, policies impact the utilization of digital media among older. The unbalanced and inadequate development of "The internet & Pension" may prompt the more senior crowds to leave and turn to pick the traditional pension model [21].

Finally, the Chinese Internet infrastructure, essential resources, and data layer dominance are defined, and there is also a lack of supply of policy tools. Accordingly, this paper argues that the lack of Internet-related policymaking or neglect of older people can sometimes lead to a digital disconnect among older people.

## 3. Materials and Methods

A research group is an elderly group that takes into account demographic characteristics. Based on the reflection brought by the concept of digital disconnection, the author conducted a semi-structured interview with the survey respondents from October 2020 to October 2022 to investigate the formation of their specific actions and ideas. With the permission of the interviewee, nearly four words of interview notes were compiled.

This study followed the corresponding coding procedure, first extracting 20 open codes, then extracting 5 related codes by using axial shape and selective coding, further refining the interview context and summarizing the phenomenon more concretely. By combing the logical framework, this study determines the primary and secondary relationships between the core categories and

different categories and tries to describe and interpret the phenomenon of digital disconnection comprehensively.

This study adopts the combination of online and offline methods, which can transcend the limitations of time and space to collect suitable samples. To ensure the reliability and validity of the research, the design of the interview outline paid attention to avoiding the induced questions, and two interviews were organized to obtain more detailed and in-depth information. Finally, the data analysis adopts the methods of cross-organization and triangle tests, trying to make the conclusion more scientific and normative.

## 4. Results & Discussion

Owing to the expansion of the Internet and various contributing factors, including environment, education, health, etc. By analyzing the interview contents, the seniors could be divided into two categories based on their initiative and the possibility of participating in smartphones since more senior citizens are now either actively or passively exposed to digital media. However, their frequency of exposure to digital media differs depending on information production, i.e., "completely disconnected" and "partially disconnected." In these two stages, the degree of disconnection reduces while the degree of access grows.

### 4.1 Completely Disconnected and Partially Disconnected

Completely disconnected is a state in which the elderly do not have any contact with digital media and are far from the Internet. According to the analysis of the interviews, because these older adults have poor hardware and software equipment conditions in Internet contact or are short in literacy, it is difficult for them to complete the operation alone. There are many alternative ways when facing online troubles to boots. They have children, relatives, and friends to solve other situations, so they passively stay away from the Internet or refuse to contact it, which generates a negative attitude toward it.

When operating media among the partially disconnected elderly group, their media use breadth and usage are influenced by their different needs. By compiling and summarizing the interview results, the media use of the interviewed elderly was as follows.

**Table 1** Digital Media Usage among The Seniors

Digital Media Usage Behavior	Reason	Example
Connected	Social Interaction	Use social apps such as WeChat to communicate with friends.
	Entertainment	Watch short videos as a form of daily entertainment.
	Electronic Payment	Use WeChat/Alipay for daily QR code payments.
	Epidemic	Show the health

	Managemen	code when entering public spaces.
	Information Acquisition	Browse news sites and search for information.
Disconnected	Physical Condition	Poor audiovisual ability or otherwise.
	Knowledge & Skills	Limited knowledge and unmatched skill.
	Economic Restrictions	Lack of smart equipment and relevant network devices.
	Digital Exclusion	Be alert and sensitive to the Internet.

In light of varying degrees of information intake, the partially disconnected older groups can be split into two groups, passive reception and active acquisition. The passive group has fewer practices of digital media, and their usage is in a small range. Interviews revealed that they had relatively low information needs and single-use functions, and the Internet is one of the ways to enrich their daily life. For these oldsters, using the Internet mainly serves purposes of socialization and entertainment. The respondent (S17) said, “I do not want to learn that, I don’t know how to shop online and I am not interested. I just want to read the news.”

The elderly obtaining information proactively would be strongly willing to integrate into the Internet. They trust the Internet for good experiences in social communication and information acquisition. Meanwhile, their peer social circles are more active in approaching digital media, and the attitude toward internet integration will be more positive. For example, respondent (S16) said, “I can learn more international events, domestic events, and weather forecasts anytime and anywhere,” and the respondent (S26) said, “The Internet is an encyclopedia for me.”

#### 4.2 Influencing factors of digital disconnect among the seniors

Older users’ integration possibility and willingness to consume digital media will be subject to Physical conditions, which are also the first consideration for aging-friendly design. Seniors with healthy conditions, which we define as good hearing and visual abilities and the capability to operate smartphones and other electronic devices, are more likely to join the Internet and are more proactively learning to use smart devices. Those in poorer health, with poorer hearing and vision, as precisely as the respondent (S4), said, “my eyes always tired when watching the phone,” and prefer to use large fonts and simple elderly push-button machines.

Moreover, the ability to discriminate, comprehension, and educational are crucial aspects that change prior years’ behavior. Seniors who perform well in these aspects are more sensitive. They treat personal and financial matters cautiously to prevent receiving unfavorable exposure. Those weak in these areas will opt to cut off to “defend themselves.” Additionally, some of them will consciously

control their digital access by disconnecting themselves after a predetermined time.

Given the environmental impact, the Internet access environment strikes at their digital access status. Such as the living environment, peer social circle, and the Internet access status of location are closely related to it. Seniors having encouragement from youngsters are persistent in scooping up smartphone. Most elders in the interview expressed a desire to communicate with their children via WeChat video. It also increased their urge to use the Internet. Respondent (S9) can grasp some skills with the help of his family, and his willingness to access digitally is enthusiastic, “it is my children who teach me, and the young people around me can also learn very quickly.”

Group also exerts influence on the initiative of the elderly to drive digital media. They become intrigued and attempt to connect when most of their friends use smartphones because of the spread of contagious emotions like sharing. When a peer circle’s Internet access is rare, there is no positive feedback and a generalized negative emotional influence, which can eventually lead to disconnection.

The installation of inter-territorial network infrastructure is another substantial element of the digital disconnect of the aging population. During the interview, some elderly gives a higher recognition to digital management for convenient online experiences and are optimistic about accessing digital media. In contrast, some older adults in towns and remote areas with lower Internet penetration can meet most of their essential needs in life and do not have the conditions to access the Internet.

The experience of intelligent devices concerning usage requirements makes an impression on access. The interviews indicate that older people are driven to have digital access under better device experiences.

### 5. Conclusion

The experience of intelligent devices concerning usage requirements makes an impression on access. The interviews indicate that older people are driven to have digital access under better device experiences.

The focus issue of this study is to clarify the subjective and objective factors of digital disconnection, especially cognitive problems, group influences, and technological access barriers in the elderly population concerning digital devices and the Internet. However, the inadequate age-appropriate design has caused some active seniors to drop out. This mixed reality requires more investigation and feasible government regulations to bridge the digital divide among seniors, especially in the accession and knowledge gaps.

Undeniably, when people get older, their physical function will decline, making it more difficult to use digital media. It is essential to pay attention to the social benefits of Internet access to the elderly. All social sectors should help them learn how to use digital devices. Only when the digital access of the elderly is effectively promoted, can we build a favorable digital ecosystem that can better serve the public welfare.

What needs to be pointed out is that this study has

limitations and room for future improvement. After all, some interviewees can't participate in the interview independently because of their physical condition and other reasons, which is bound to strike the survey results. How to overcome the factors that may cause data deviation in the process of studying the elderly population deserves further discussion and discussion. Overall, this study may provide some experience and strategic reference for other scholars to study issues such as the elderly's adaptation to the Internet age and the elderly-friendly functional design.

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