Bridging the Second-Level Digital Divide: Prioritizing Emotional and Social Literacy through Intergenerational Communication in Rural China

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Abstract: Based on interviews with 52 Xianchong Village residents, this study shows older adults value emotional comfort, relational ties, and family support in digital inclusion. Rather than technical skills alone, seniors emphasize well-being and social cohesion when using technology. Intergenerational communication—especially reciprocal family learning—reduces digital alienation, reflecting Confucian ideals of filial piety and responsibility, especially in rural contexts dominated by family networks. While some barriers resemble first-level divides, findings mainly address second-level dynamics, highlighting emotional and social aspects of digital literacy. Mechanisms such as reassurance, cultural continuity, and reciprocity persist across technological shifts, reframing digital inequality as relational and affective, and revealing how enduring cultural norms shape engagement.

Keywords: Generational digital divide, intergenerational communication, emotional digital literacy, social digital literacy.

The generational digital divide can have far-reaching implications for social inclusion and overall quality of life (Hargittai, 2002; Volkom *et al*., 2014). Most research on the generational digital divide has focused on perceptions towards the divide (e.g., Helsper & Reisdorf, 2017), antecedents (e.g., Neves *et al*., 2018; Zhou *et al*., 2022), consequences (e.g., Charness & Boot, 2016) and skills-focused solutions (e.g., He *et al*., 2022). However, it is still unclear how older adults perceive and understand the nature of digital technologies, how this perception and understanding relates to their attitude to various dimensions of digital literacy, and how intergenerational communication influences efforts to mitigate the generational digital divide. Particularly, the current study aims to identify underexplored dimensions of digital literacy that are perceived to be important by older adults. Digital literacy is crucial for older adults because it allows them to stay connected with family and friends, access essential services like online healthcare and banking, stay informed, and maintain independence in a world increasingly reliant on digital platforms (Mullins, 2022).

Media System Dependency Theory (MSDT; Ball-Rokeach & DeFleur, 1976) suggests that individuals' reliance on media systems intensifies during periods of social change and structural ambiguity, when traditional means of understanding, orientation, and social connection become destabilized. Rural China's rapid digitalization constitutes precisely such a period of structural change, making older adults' media dependency and the emotional and relational dimensions of that dependency a theoretically significant site of inquiry for communication scholarship.

This study contributes to broader sociological debates by emphasizing that the generational digital divide is not merely a technical disparity, but a form of social inequality shaped by emotional, relational, and cultural dimensions. Rather than viewing older adults as deficient or in need of modernization, we conceptualize digital exclusion as a socially structured phenomenon tied to broader patterns of ageism, symbolic marginalization, and intergenerational disconnection (Neves & Amaro, 2012; Selwyn, 2004). This study examines how digital practices are embedded in family dynamics, cultural norms, and emotional investments, particularly in non-Western rural contexts.

In China, Confucian traditions emphasize hierarchical family structures and reciprocal obligations between generations (Berthrong, 2008). These norms shape digital learning as a collective endeavor rather than an individual task. Our goal is to reframe the digital divide not as an individualized problem of skills, but as a collective and situated process influenced by the distribution of digital capital, generational hierarchies, and social cohesion (Hargittai & Hsieh, 2013; López Peláez *et al*., 2021). In doing so, this study aligns with contemporary sociological efforts to

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expose the hidden infrastructures of inequality in digital life (van Dijk, 2020). To answer the aforementioned research questions, we conducted in-depth interviews with 52 residents of Xianchong Village in 2022.

LITERATURE REVIEW

Generational Digital Divide

This paper addresses the digital divide through a sociological lens by situating emotional and social dimensions of digital literacy within ongoing debates about technological inequality, intergenerational communication, and digital inclusion. The digital divide refers to the gap between individuals who have access to digital information and communication technologies and those who do not (Hargittai, 2002). Initially, the concept was concerned with the disparity in access to computers and the Internet between different demographic groups – called first-level digital divide (Norris, 2001). The first-level digital divide refers to disparities in physical access to digital technologies, such as devices and internet connectivity. In contrast, the second-level digital divide focuses on differences in digital skills, usage patterns, and the ability to effectively engage with digital content (Hargittai, 2002; van Dijk, 2020). As digital technologies have become more integral to daily life, the scope of the digital divide has expanded to include the quality of Internet connections, the variety of devices available, and the skills and competencies required to use digital technologies effectively – called second-level digital divide (van Dijk, 2020). This study primarily engages with the second-level digital divide, examining how emotional and social dimensions of digital literacy influence older adults' engagement with digital technologies. In this paper, digital technologies refer to a wide range of digital innovations, including the Internet, social media platforms, mobile devices, and artificial intelligence, which have significantly transformed societal, economic, and cultural practices (Croteau & Hoynes, 2021).

The digital divide is not merely about access and skills but also encompasses differences in usage and engagement across generations (Willis & Tranter, 2006). A study focusing on social media use in China found significant generational differences, with older adults less likely to access and engage with these platforms (Zhou *et al*., 2022). A variety of factors such as socioeconomic status, education levels, and perceptions of technology contribute to this divide (Zhou *et al*., 2022).

The generational digital divide is defined as disparities in the use and adoption of digital technologies across age groups (Hargittai, 2002). From a sociological standpoint, while older adults are more likely to experience digital exclusion, this is not a monolithic experience but varies by education, income, gender, and ethnicity (Hargittai, 2020). Younger people, particularly those from higher socio-economic backgrounds, often possess "digital cultural capital" (Ollier-Malaterre, 2019). In contrast, older adults with less exposure to formal education may lack such capital, compounding existing social inequalities. Therefore, younger generations are often framed as "digital natives," while older people are cast as "digital immigrants" (Prensky, 2001). Older generations face unique barriers to digital adoption (Helsper & Reisdorf, 2017; van Dijk, 2020). These barriers often include a lack of digital literacy, cognitive challenges, and inadequate infrastructure, which collectively hinder older adults' engagement with digital tools (Livingstone & Helsper, 2007; Neves *et al*., 2018). By contrast, younger generations tend to display a naturalized relationship with digital technologies. Most of them have grown up surrounded by digital devices and internet-based platforms. Further, younger, digitally fluent individuals dominate digital spaces, marginalizing older members. This marginalization can create generational silos and reduce opportunities for knowledge exchange and emotional bonding (Charness & Boot, 2016). However, critics argue that this perspective naturalizes generational hierarchies and obscures the role of institutions in structuring digital engagement (Bayne & Ross, 2007). Some sociologists draw on Bourdieu's (1986) theory of cultural capital to argue that unequally distributed digital skills reflect broader structures of advantage in society (Kimani, 2023).

The generational digital divide is not solely technological; it has significant psychological, relational, cultural, and sociological dimensions. Several scholars have emphasized relational aspects of the digital divide, noting that technology use is embedded in social ties and community structures rather than being purely technical (Hampton & Wellman, 2003; Lupton, 2020). Our study builds on this foundation but extends it by examining how emotional comfort and intergenerational reciprocity shape digital engagement in a rural Chinese context. In this study, we use 'emotions' in line with sociological scholarship that treats them as socially constructed and relational phenomena rather than mere individual feelings (Illouz,

2007). Emotions such as shame, loneliness, and trust/distrust are central to understanding digital exclusion because they mediate social belonging and identity in digital contexts. Prior research shows that shame often accompanies perceived incompetence in digital environments (Schreurs *et al*., 2017), loneliness emerges when digital exclusion limits social interaction (Neves, 2015), and trust/distrust shapes willingness to engage with online platforms (López Peláez *et al*., 2020). These emotional dynamics are not peripheral but constitutive of the generational digital divide.

Further, younger individuals often perceive digital spaces as integral to identity formation, social interaction, and self-expression (Hargittai & Dobransky, 2017). For them, online activities such as social media use, content creation, and virtual networking are deeply embedded in their daily routines. On the other hand, older adults tend to view digital technologies as supplemental or even disruptive to their existing lifestyles (Martson *et al*., 2019). This often leads to feelings of exclusion and isolation among older adults, who may struggle to participate in digital conversations or social media engagement (Charness & Boot, 2016).

The life course perspective provides another key sociological lens. From this view, technology adoption is shaped by biographical factors such as employment, family roles, retirement, and health (Neves & Amaro, 2012). Structural constraints such as declining cognitive function, physical impairments, and lack of training opportunities particularly affect older adults (Schreurs *et al*., 2017). At the same time, social policies and institutional practices may reinforce ageist assumptions—for example, an assumption that excludes older adults from digital-first government services or work transitions (Quan-Haase *et al*., 2016). Thus, the generational digital divide is not just about age per se but about how social structures enable or inhibit digital participation at different life stages. Critical sociologists argue that the generational digital divide is a symptom of neoliberal governance, where individuals are expected to self-manage their digital skills without adequate public support (Selwyn, 2004). This individualization of responsibility masks the role of policy failures, market-driven design, and educational inequality in producing digital exclusion.

Recent scholarship also highlights that even when older adults gain access and skills, platform logics and algorithmic design can marginalize their participation. Age biases in algorithmic personalization, interface design, and content moderation contribute to another level divide, where older users may be subtly excluded or misrepresented (van Deursen & Helsper, 2015). Commercial platform cultures often privilege youth-oriented norms, aesthetics, and interaction styles, which may alienate older users. Overall, we could say that the sociological debate over the generational digital divide has evolved from simplistic access-based models to more nuanced, structural, and critical frameworks.

The concept of the digital divide has deep roots in communication research. Early studies of the knowledge gap hypothesis (Tichenor *et al*., 1970) demonstrated how unequal access to communication resources can generate and reproduce broader social inequalities. Within this tradition, Media System Dependency Theory (Ball-Rokeach & DeFleur, 1976) holds that people grow more dependent on media systems precisely when they rely on those systems to make sense of their social world and guide everyday action. This dynamic is especially visible in rural China, where family interaction, village affairs, and access to local information are increasingly mediated through digital platforms. For many Xianchong seniors, difficulties in using digital technologies therefore represent more than a lack of technical skills. They can also limit individuals' ability to follow community affairs, maintain social relationships, and participate in everyday village life. The generational digital divide, then, is as much a communication inequality as a technological one.

Research Questions

While existing scholarship offers insights into the generational digital divide, several critical gaps remain unaddressed. One significant underexplored question is what exactly seniors feel about digital technologies. Despite the potential benefits, many older adults experience anxiety and social exclusion in digital environments (Wang *et al*., 2023). But most prior studies have centered on how social services and technology training can mitigate the generational gap and enable older adults to reap the benefits of digital technologies (e.g., Czaja *et al*., 2006; He *et al*., 2022). Previous studies also have focused on how to improve digital skills (e.g., Pangrazio *et al*., 2020), with less attention to what older generations actually perceive as the meaning and role of digital technologies. Thus, we first ask:

RQ1: How do older adults in Xianchong view the nature and role of digital technologies in their lives? How much are they interested in learning digital technologies?

Another key gap in the literature lies in the specific interactions between younger and older generations. Several studies have reported the importance of intergenerational communication regarding the digital divide. For example, targeted interventions, such as participatory digital storytelling and shared digital experiences, have been proposed to enhance intergenerational dialogue (Wexler, 2011). Intergenerational exchange programs have shown promise in bridging the gap by facilitating mutual learning and social cohesion (Webster *et al*., 2024). Despite these efforts, few studies have investigated how intergenerational communication takes place in specific social settings such as family.

Understanding intergenerational communication is crucial in exploring the digital divide because it can shed light on how different age groups experience and adapt to digital technologies, influencing their access and usage patterns. Several scholars have looked at the impacts of intergenerational communication on the digital divide. In the Netherlands, university students helped senior citizens learn how to use the Internet through social events and volunteer programs, which played a crucial role in enhancing the seniors' social integration (Luijkx *et al*., 2015). In Italy, similar efforts saw grandparents and grandchildren participating in short-term digital interactions aimed at promoting cultural exchange (Dibeltulo *et al*., 2020). Interactions with young adults also benefit the well-being of older adults (Freytag & Rauscher, 2017).

For older adults, engaging in meaningful conversations with younger generations can provide a sense of purpose and connection to evolving society (Wang *et al*., 2023). Facilitated intergenerational communication and support systems may empower older adults to overcome barriers and actively participate in the digital society (Costa *et al*., 2019; Czaja *et al*., 2006). Younger adults benefit from the wisdom and life experiences shared by their older counterparts (Luchesi *et al*., 2016). These exchanges foster empathy and respect, promoting a more inclusive society where different generations collaborate and learn from each other (Bengtson *et al*., 2002). Still, we do not know much about how intergenerational communication takes place and what nuanced roles intergenerational communication plays in specific settings, eventually mitigating the digital divide. This study focuses on intergenerational communication in family and community settings.

RQ2: How do different generations engage in communication in family and community settings in a rural town and how does it affect the generational digital divide?

Although many studies suggest the importance of digital literacy to reduce the digital gap between younger and older generations, few studies have looked into emotion- and relationship-focused digital literacy. Regarding this, this research pays attention to Martínez-Bravo *et al*.'s (2022) study, which content analyzed digital literacy frameworks from eight different institutions and initiatives – UNESCO, European Union, OECD, ATCS, P21, NETS, NAEP, and Engauge – and identified six essential dimensions of digital literacy: critical, cognitive, operational, social, emotional, and projective.

Critical digital literacy involves adopting specific perspectives, attitudes, and values when navigating various contexts, fostering social and civic responsibility, and making informed decisions. Cognitive digital literacy emphasizes the development of advanced cognitive skills, including problem-solving, managing complex environments, logical reasoning, and in-depth analysis. Social digital literacy focuses on engaging with others and cultivating a sense of community belonging. Operational digital literacy pertains to problem-solving from a more technical and functional perspective. Emotional digital literacy encompasses the management of one's own emotions and those of others during social interactions and the establishment of healthy interpersonal relationships. Finally, projective digital literacy entails recognizing and adapting to complex, ever-evolving environments and situations (Martínez-Bravo *et al*., 2022). Many prior studies have examined critical, cognitive, operational, and projective dimensions of digital literacy, but less attention has been paid to emotional and social digital literacy. This study aims to identify what dimensions of digital literacy are perceived to be important.

RQ3: What dimensions of digital literacy do Xianchong seniors prioritize in developing digital literacy regarding the generational digital divide and why do they think so?

Lastly, studies have rarely looked into the cultural nuances of the digital divide, particularly in non-Western and rural contexts. Much of the existing research is heavily situated in Western societies, with an emphasis on urban and technologically advanced environments (Helsper & Reisdorf, 2017). This

geographic and cultural bias leaves a limited understanding of how the digital divide manifests in non-Western, rural, or indigenous communities, where structural inequities such as limited Internet access, cultural attitudes towards technology, and linguistic barriers may play a more significant role (James, 2021). Therefore, research should examine culturally specific barriers and opportunities for digital technology adoption and use in order to provide a more comprehensive understanding of the digital divide. This is why we selected Xianchong, a typical rural town in China, for a case study.

Research Context – Xianchong Village

Xianchong Village, located in Fuoshan City, Guangdong Province, China, is a small rural community with a population of approximately 7,100 residents. The primary occupations are agricultural and artisanal. Xianchong Village is rich in cultural heritage, with residents observing traditional customs and rituals handed down through generations. Particularly, the town is unique in its preservation of Zhu Zi's culture. The Zhu Clan in this village traces its lineage back to Zhu Xi, a prominent Confucian scholar who is highly esteemed alongside Kongzi (Confucius) (Berthrong, 2008). Further, in Xianchong Village, various traditional festivals such as the Spring Festival and the Mid-Autumn Festival are celebrated with traditional lion dances, dragon dances, and local folk music.

Industrially, Xianchong Village has seen development in recent years mainly thanks to China's rural revitalization strategy, a comprehensive policy framework aimed at addressing the economic, social, and environmental challenges faced by rural areas (Liu *et al*., 2020). The strategy was officially proposed by the Communist Party of China in 2017. Xianchong is an exemplary case of rural revitalization. Small-scale industries complement its agricultural base, with local crafts such as bamboo weaving and pottery contributing to the village's economy. These artisanal products attract tourists seeking authentic cultural experiences. Xianchong Village remains a testament to the enduring traditions of rural China, balancing progress with cultural preservation. Like in other rural towns in China, new media are increasingly adopted among the residents of Xianchong Village. Many residents use mobile phones. Particularly, young residents heavily rely on smartphones and social media for information and communication. This sometimes creates a generational collision. Thus, we believe Xianchong Village is a good case demonstrating the generational digital divide.

METHOD

Our research team visited Xianchong Village between January and March 2022 and conducted in-depth interviews with 52 villagers. This research was approved by the Ethics Committee of a public university in China. We sought diversity in recruiting participants particularly in terms of age and professional backgrounds. The ages ranged from 19 to 89. Before interviewing minors, we obtained consent from their guardians as well as from themselves. According to common classifications (e.g., Petry *et al*., 2002), "young adults" are typically considered to be between 18 and 35 years old, "middle-aged adults" between 36 and 55 years old, and "old adults" are 56 years old and older, with some variations depending on the specific study or context. Our participants are young adults (n = 15), middle-aged adults (n = 7), and older adults (n = 30). In terms of occupations/community positions, interviewees can be categorized into three groups – ordinary villagers, professional workers (educators, businessmen and entrepreneurs, village committee managers, and clan association presidents), and representative cultural activists (calligraphy class teachers, lion dance team leaders). In our data, 39 (75%) are males and 13 (25%) are females.

Each interview lasted one to two hours. Seven trained research team members conducted the interviews (three professors from Jinan University and four college students). The questionnaire included items about media use habits, adoption and use of digital technologies, perception towards digital technologies and the generational digital divide, the experience of cultural/community activities, interpersonal and intergenerational communication, and opinions about family, clan and the village culture. All interviews were audio-recorded or video-recorded with the consent of the participants. Mandarin or Cantonese was used in the interviews. The interview transcripts were translated into English by a researcher, who is fluent in both Chinese and English. All interviewees were anonymized and assigned participant IDs (P1–Pn). All identifiers in the manuscript have been standardized accordingly.

To investigate audiences' response in the interviews, we conducted a thematic analysis. Thematic analysis is a method used for identifying, analyzing, and reporting thematic patterns within qualitative data (Braun & Clarke, 2006). We first familiarized ourselves with the data by transcribing the

interviews and reading through the transcript multiple times. Next, we generated initial codes by systematically coding interesting features of the data across the entire dataset. Next, we searched for themes by collating codes into potential themes and gathering all data relevant to each potential theme. Finally, we wrote a detailed analysis from the data, relating back to the research questions and literature.

Findings

The findings are organized to mirror the three research questions. The first section addresses RQ1 by examining how Xianchong seniors understand the role of digital technologies and why their willingness to learn depends on perceived purpose. The second section addresses RQ2 by analyzing how intergenerational communication within families and the wider community shapes the generational digital divide. The third section addresses RQ3 by clarifying which dimensions of digital literacy seniors prioritize, with particular attention to the boundaries among operational, emotional, and social digital literacy.

Older Adults Learn Digital Technologies with a Purpose (RQ1)

The interviews reveal that the generational digital divide is closely related to lack of technological proficiency. A number of senior residents in Xianchong expressed a wish to become versed in digital technologies. They admitted the value of learning how to use digital technologies without difficulty, such as calling through WeChat [Chinese version of Facebook]. P9 (age 70) said, "Because of business reasons, I use the mobile phone a lot." However, at the deeper level, seniors[1], feelings and attitudes towards digital technologies were more complex than expected. the reasons for this complexity can be summarized as: (1) stress from having to catch up with digital technologies; (2) feelings of unfamiliarity; and (3) doubt about the need for various digital devices.

Many seniors said that the digital world is often overwhelming. While these sentiments may appear to reflect first-level digital divide issues such as a lack of exposure to devices, they are more accurately defined as second-level challenges because the barrier is not the physical absence of technology, but the affective and cognitive inability to use it effectively. In Xianchong, the first-level divide has largely been bridged through smartphone ownership, shifting the inequality to the second-level: the struggle with emotional demands and usage confidence. Their experiences of digital fatigue, unfamiliarity, and perceived lack of relevance point to deeper issues of usage, confidence, and emotional engagement—core aspects of the second-level digital divide. For example, emotional tolls often come with adapting to digital environments. P3 (age 67) said, "I've started using messaging apps and online shopping, but honestly, it drains me. I feel more than tired." This exhaustion reflects more than technical difficulty; it signals emotional fatigue and anxiety. Feelings of shame were evident when seniors compared themselves to younger generations. For example, P5 (age 70) said, 'I feel embarrassed asking my grandson again and again. It makes me feel useless.' Loneliness also surfaced: 'Sometimes I feel left out because everything is online now' (P11, age 68). Trust issues appeared in comments like, 'I don't trust online payments; what if I lose everything?' (P20, age 72). These emotions illustrate how digital exclusion is deeply emotional. P13 (age 65) agreed, saying that learning digital skills entails a big stress. 'Digital fatigue' was quite often mentioned by senior residents. A few seniors din't own and use any digital devices. Some seniors said that the lack of respect and rampant incivility online hinders them from engaging in the digital world.

Further, many seniors felt that most digital devices are too complicated and hard to learn although recently many tech companies are simplifying major features of digital devices for easy use. Several seniors mentioned that digital gadgets inherently feel unfamiliar and unnatural to them despite the simplicity of the gadgets. Indeed, research shows that older adults are more likely to show indifference towards digital technologies, given their unfamiliarity with the digital world (Costa *et al*., 2019). P17 (age 24) a member of the Xianchong Charitable Foundation, said: "If the elderly want to video chat with their sons and grandsons and meet online, we teach them how to use WeChat and so on… This is quite difficult for the elderly, and requires constant repetition, just like teaching primary school students."

It should also be noted that there is much variation in seniors' motivations for digital skills acquisition although younger generations and society in general assume that older adults are also interested in learning

[1]We used the terms "seniors," "older adults," and "older citizens" interchangeably.

digital skills. Broadly, Xianchong seniors belong to one of three groups: (1) hesitant, (2) pressured, and (3) interested. A substantial number of seniors didn't have a strong need to learn various digital skills although the Xianchong leadership often emphasizes necessity. Older adults asked why they have to learn how to use all kinds of digital gadgets although they rarely or never use them in everyday life. This reluctance confirms that the divide has shifted from the first level (access) to the second level (usage). Even when devices are physically present in the household, a lack of perceived utility and emotional readiness creates a 'usage gap' that maintains the digital divide despite technical availability. P31 (age 68) said, "What's the use of all the learning?" Another senior said that he cannot find the need for using digital devices except the smartphone. Some saw the value of online shopping or online banking, but most seniors in the village had mediocre interest in most digital technologies.

Second, some seniors saw the value of digital technologies but confessed their use of them wa**s** not necessarily voluntary. P14 (age 65) said, "As far as I feel comfortable with any digital device, I am fine with that. But honestly, I don't want to get too much involved in it." Several seniors revealed the sentiment of "not feeling left behind." This sentiment indicates that the generational digital divide is closely connected to feelings of isolation and exclusion of senior citizens from the digital world and their local community. Some residents worried that older adults often feel left out when events are primarily advertised and coordinated through digital technologies. Many seniors also said that they feel pressured from the social mood and trend, which suggests that their attitude to digital technologies is mixed with some level of interest, social pressure, and feelings of exclusion.

The last group ("interested") was more willing to learn digital skills than other groups, but not many seniors belong to this category. People in this group asked for more opportunities to learn digital skills and wanted to remain relevant in this contemporary world.

Overall, the interviews show that older adults possess various sentiments toward digital technologies. Our findings echo what Tom Kamber, executive director of Older Adults Technology Services, said about senior citizens: "We need to meet them where they are" (Nash, n.d.). Thus, we cautiously conclude that Xianchong seniors will learn digital technologies when they feel a purpose.

Intergenerational Communication Bridges the Divide (RQ2)

We found family communication plays a crucial role in bridging the digital divide in Xianchong. The family unit provides a nurturing environment where emotional and psychological aspects of digital life can be promoted and shared among family members (Yeo *et al*., 2022). For example, P10 (age 71), a construction industry worker, emphasized the importance of family as a role model in Xianchong. He noted, "Parents should be role models, my father's generation to be my role model, I do my children's role model…. It's all a kind of subtle influence." Many other residents also emphasized 'familial support' as a critical component that can deal effectively with the digital gap between young and old members. "We have a good family style evaluation, advocate family harmony, (…) to promote the formation of harmonious development of our village, family harmony, which is very important, especially in the current environment, young people should know more about this culture" (P6, age 54).

The importance of family role in the digital life stems from the assumption that there are fundamental values that all residents should follow no matter how they use digital media. P9 (age 70), working in floriculture and tree cultivation, said: "We have a family WeChat group. I see what is right or wrong will be shared in the family group, in terms of filial piety to parents. My children are doing very well. This is also considered our Xianchong glorious tradition." This comment shows that the role of family is more about the inheritance of common familial values, rather than simply sharing digital knowledge.

From the interviews, we noticed the crucial function of "strong ties" within a family in navigating the intergenerational digital divide. Strong ties refer to close, emotionally significant relationships that provide trust and frequent interactions while weak ties are connections with people who are not known intimately or seen frequently. These connections include acquaintances, casual friends, former colleagues, or people with whom there is infrequent interaction (Granovetter, 1973; Kim & Fernandez, 2023). Strong ties are essential in bridging not only digital gaps but also the emotional and psychological challenges of digital life (Neves, 2015). As a representative example of strong ties, family seems to function as a significant leverage to help narrow the generational digital gap through the build-up and maintenance of family members' emotional well-being.

Many Xianchong residents described how shared digital experiences within a family benefit emotional comfort and deepen familial bonds. They said that family provides a trusted space for discussing various personal issues such as privacy concerns and transaction problems. By engaging in almost unlimited interactions, family communication reinforces the trust and closeness among the members and facilitates their emotional resilience. Particularly, with the help of family members, elders can overcome feelings of isolation, dispel digital fear, and embrace digital opportunities with more confidence. In short, family can play a pivotal role in supporting the emotional well-being of older adults.

We also found that The strength of the family unit lies in its role in reciprocal learning. Older members of a family share their wisdom and life experiences, while often relying on the younger members to navigate the digital world. Older members also impart cultural traditions, while younger members deliver digital literacy to older members. In this process, seniors can overcome digital stress and adapt smoothly to the digital world. Younger family members, in turn, feel a greater appreciation for their elders' determination to inherit longstanding familial and cultural values. Through reciprocal learning, families can create a new avenue to narrow the generational digital divide. Many residents said, "It's a fair trade, and we both feel accomplished."

One interesting aspect of family communication was that many seniors often get help from their grandchildren more frequently than from their children. "My grandpa often asks us to buy. 'You buy it online for me'" (P48, age 25). P36 (age 70) remarked, "When my granddaughter teaches me how to use the smartphone, I don't feel left behind. It's like we're both learning together." Intergenerational learning between grandparents and grandchildren can be effective in enhancing digital knowledge and skills among the elderly (Dibeltulo *et al*., 2020). A strong relationship between grandparents and grandchildren is vital for a child's emotional well-being because it provides them with a sense of stability, wisdom, and a connection to family history. Such relationship also offers benefits to grandparents through increased social interaction and a renewed sense of purpose.

The interviews demonstrate that while younger generations focus mostly on convenience and efficiency, seniors often prioritize a sense of bonds. For this reason, seniors fear their relationships with other generations, particularly young people, could suffer. P47 (age 63) said, "We want to feel part of the same world as our children and grandchildren, not just understanding their gadgets." This sentiment underscores that the digital divide is fundamentally about belonging—a concern that persists even as technologies evolve. Many seniors hoped for more relational connection with younger generations. Seniors preferred feeling valued and connected through digital gadgets. This emphasis on family-based learning is partly cultural – rooted in Confucian ideals of filial piety – and partly structural, as rural communities depend more on family networks due to fewer formal training opportunities. For example, P39 (age 71) said, "My children and grandchildren are my teachers now; we learn together because there is no class here." P19 (age 64) said, "Don't just teach us. Sit with us. Share your experiences, and let's grow together." The emphasis on "sitting together" and "sharing experiences" reflects a desire for mutual understanding. Many younger residents agreed that sharing ideas and creating a common ground in the digital space is important in tackling the digital divide.

Overall, these findings answer RQ2 by showing that intergenerational communication, particularly within families, shapes older adults' digital engagement through learning, support, and negotiation of participation. In Xianchong, the digital divide is therefore not only an individual skills gap but also a communicative relationship negotiated across generations.

Importance of Emotional and Social Digital Literacy (RQ3)

This section addresses RQ3 by distinguishing among three dimensions of digital literacy relevant to older adults' digital engagement. Operational digital literacy refers to the technical capacity to execute digital tasks, such as navigating an app interface or completing an online payment. Emotional digital literacy refers to the affective capacity to manage comfort, anxiety, shame, trust, and confidence during digital engagement. Social digital literacy refers to the relational capacity to use digital technologies to sustain family ties, participate in community life, and transmit shared cultural values. Although all three dimensions matter, the interviews show that Xianchong seniors prioritize emotional and social digital literacy over operational mastery.

Emotional digital literacy emerged most clearly in seniors' accounts of fear, embarrassment, fatigue, and

emotional comfort. Fear of failure and embarrassment were common barriers even when devices or informal assistance were available. For example, P35 (age 66) said, "At first, I felt so overwhelmed, like I was learning a foreign language." This response concerns emotional literacy rather than operational literacy because the primary obstacle is not simply how to use a tool, but how to manage the anxiety and loss of confidence produced by digital engagement.

Many older adults also emphasized emotional connection with loved ones through digital tools such as video calls, social media, and messaging apps. This connection can significantly improve seniors' emotional well-being. "Emotional comfort" was frequently mentioned among older adults. Several seniors highlighted the importance of building a sense of emotional familiarity with digital technologies. Emotional digital literacy involves the ability to understand and manage one's own emotions and those of others during digital interactions. It includes the management of digital identity and the protection of one's humanity against risks that digital technologies can pose (Fuller-Iglesias *et al*., 2015).

Social digital literacy was visible when residents connected digital engagement to shared community values. For example, both older and younger residents appreciated ZhuZi's culture, since philosopher Zhu Xi is the signature of this village. Residents emphasized that Zhu Zi's culture must be passed down to both older and younger generations through digital technologies. P6 (age 54), director of village committee joint stock cooperative, said that young people easily learn the traditional cultural heritage and utilize smartphones to capture this cultural atmosphere, helping the traditional culture spread to a wider audience. This concern is social rather than merely emotional because the focus is collective participation, cultural transmission, and community belonging.

Some seniors expressed worries that digital technologies may not be appropriate for maintaining cultural identity. Older villagers mentioned that snippets of traditional dances and songs online may not convey the full meaning and context behind them. P25 (age 78), a former secretary, said that the virtual world overshadows real-world relationships, weakening the fabric of the community. Further, older adults in Xianchong, who possess rich cultural knowledge and historical insights, are often digitally excluded, limiting their ability to share their cultural heritage using digital tools. However, most residents pointed out the positive role of digital technologies in keeping cultural identity. P48 (age 25) said that digital media can offer the opportunity for community members to create a sense of commonality and co-presence. Most younger residents also said that digital platforms allow for the wider dissemination of cultural content and provide a new avenue to cultural preservation. All generations understood that the generational digital divide might impact the cohesion and identity of the community. They also admitted that keeping a sense of community identity is important when utilizing digital technologies for the village.

Some residents suggested that balancing digital innovation with traditional methods of engagement is important in fostering a cohesive community (P11, age 89). P16 (age 41), a landscape and garden engineering entrepreneur, said that a slower pace may be needed in this fast-paced digital age: "I feel that more and more people are getting involved and more and more lively, and this kind of thing is not something that can be made in one or two years, but it should be passed on slowly so that it can continue." Many residents suggested everyone should participate equally in the opportunities offered by digital technologies. They saw the value of open discussion in the decision-making process regarding the adoption of new technologies for community tradition. Taken together, shared community values and common experiences are essential in dealing with the generational digital divide, and many residents asked for more attention to social dimensions of digital literacy.

Overall, RQ3 shows that Xianchong seniors value emotional and social digital literacy more than operational or cognitive digital literacy. Operational skills remain necessary, but seniors described them as meaningful only when they reduce anxiety, preserve dignity, strengthen relationships, and support participation in family and community life.

Taken together, the findings answer the three research questions as follows. Regarding RQ1, the divide is primarily a second-level issue defined by emotional fatigue, unfamiliarity, and perceived irrelevance rather than a simple lack of devices. Regarding RQ2, intergenerational communication, especially reciprocal family learning, helps transform digital tools from alienating objects into meaningful social conduits. Regarding RQ3, seniors prioritize emotional and social digital literacy because these dimensions connect digital engagement to dignity, belonging, cultural continuity, and everyday relational life.

DISCUSSION

Prior studies on the digital divide have often focused on how to develop skills of using digital technologies, as meta-analyses have shown (e.g., Lythreatis *et al*., 2022). The digital divide concept originated within mass communication scholarship as an extension of the knowledge gap hypothesis (Tichenor *et al*., 1970), which examined how unequal access to media systems produces and reinforces social inequality. We extend this communication-centered tradition by foregrounding media dependency and communication infrastructure as explanatory mechanisms. From this perspective, the generational digital divide is not a static skills gap but a communication inequality that affects how older adults understand, orient themselves within, and participate in a rapidly digitalizing social world.

One important finding is that Xianchong seniors reported digital stress, feelings of unfamiliarity, and skepticism toward the need for many digital devices. Their motivations to acquire digital skills also varied significantly, ranging from "hesitant" to "interested," which challenges the assumption that older adults are a homogeneous group. These findings suggest that strategies for mitigating the generational digital divide must be nuanced and attentive to individual motivation. It is critical to distinguish that "unfamiliarity" in this context is not a symptom of the first-level divide, or lack of hardware, but a hallmark of the second-level divide, or unequal digital capital, confidence, and usable skills. Because many seniors in Xianchong possess the necessary devices, their continued exclusion is driven less by physical connectivity than by emotional resilience, social integration, and perceived relevance.

This study makes a theoretical contribution to the study of the digital divide by examining two underexplored dimensions of digital literacy. Unlike traditional digital literacy frameworks that emphasize operational skills and cognitive competencies, our study articulates the significance of emotional and social digital literacy. Although several studies have touched on the emotional aspect of digital literacy (e.g., Lincenberg, 2021), they have not thoroughly examined why emotional digital literacy is treated as important by seniors and how it plays out when seniors try to navigate the digital world. Media System Dependency Theory helps explain why this emotional dimension matters. Ball-Rokeach and DeFleur (1976) describe media reliance as need-driven: people turn to media systems for understanding, social orientation, and even entertainment, and this reliance grows stronger as social conditions become less stable. Rural China's rapid digitalization fits that description closely, which may be why media dependency feels emotionally loaded for Xianchong's seniors rather than simply a matter of mastering a new tool.

Our study contributes theoretically by elevating emotional digital literacy as a theoretically significant category for both communication and sociological scholarship. By explicitly incorporating emotions such as shame, loneliness, and trust/distrust, we extend emotional digital literacy beyond general affect to include sociologically significant states that structure digital engagement. These emotions are relational—they arise in interactions with family, community, and technology—and thus demand a framework that situates them within social hierarchies and cultural norms. Defined as the ability to navigate digital environments with emotional resilience and awareness (Fuller-Iglesias *et al*., 2015; Martínez-Bravo *et al*., 2022), emotional digital literacy shapes whether older adults feel empowered or excluded in digital interactions. It encompasses skills such as recognizing emotional cues in online communication, controlling one's emotional responses, and empathizing with others in virtual environments (Martínez-Bravo *et al*., 2022). This suggests that emotional connections play a central role in digital engagement (Eshet-Alkalai & Soffer, 2012). Older adults' perceived alienation from digital systems is not only technical but also emotional, marked by anxiety, embarrassment, and psychological fatigue (Charness & Boot, 2022). These dynamics mirror broader discussions in sociology about affective inequality (Illouz, 2007), suggesting that emotional capacities are unevenly distributed and socially conditioned. Integrating emotional digital literacy into digital education can significantly enhance learners' attention to and interest in digital technologies.

Family communication also explains how emotional digital literacy is developed in practice. Robust family communication functions as a support system that mitigates digital stress and fosters confidence in digital interactions (Neves, 2015). This interdependence resonates with theories of intergenerational reciprocity (Silverstein & Bengtson, 1997) and challenges deficit models of aging that depict seniors as passive recipients of care (Neves *et al*., 2018; Marzo, 2024). Instead, digital learning becomes a bidirectional process of emotional exchange. Family, as a symbolic example of "strong ties" (Granovetter, 1973), offers an environment in which technical help is inseparable from reassurance, patience, and dignity. Seen through

MSDT, family is where needs for orientation and understanding actually get met. In a kinship-dense village like Xianchong, media dependency is resolved through relationships rather than institutions. This pattern may differ from urban Western contexts, where digital dependency is more commonly resolved through formal institutions such as digital literacy programs and training initiatives.

Equally important is our theorization of social digital literacy, which involves the capacity to use digital technologies to sustain social ties, participate in community life, and transmit shared values. Older adults who are unable or unwilling to use digital tools may feel marginalized, leading to weaker social ties and reduced participation in communal life. This digital exclusion not only negatively affects individuals but also weakens their ties to the community and sense of belonging (Hampton & Wellman, 2003). From a long-term perspective, digital exclusion of seniors may undermine the cohesion and inclusivity of a community (Correa & Pavez, 2016). In Xianchong, older adults did not reject operational skills; rather, they judged such skills by whether they supported relational closeness, cultural continuity, and community belonging.

Beyond the family setting, intergenerational communication offers psychological benefits for older adults by promoting empathy and mutual understanding between younger and older individuals. For older adults, meaningful conversations with younger generations can provide a sense of purpose and connection to the digital world (Wang *et al*., 2023). The key point is not merely that younger people teach older people how to use devices, but that shared digital practices can create a common communicative ground. In doing so, we add to the emerging field of relational digital sociology, which views technology use as shaped by relationships rather than individual attributes (Lupton, 2020).

Moreover, our rural Chinese context makes a vital contribution to the de-Westernization of digital divide research. Our study makes a vital contribution to understanding how Confucian values and rural social organization intersect to shape digital learning. While family support is a feature of Chinese society broadly, its intensity in Xianchong reflects rural dependency on kinship networks. Our study illustrates how cultural norms and emotions jointly structure digital inclusion. Much existing literature remains centered on urban, Western societies (Helsper & Reisdorf, 2017). By highlighting how Confucian values, intergenerational responsibility, and familial hierarchy structure digital learning in Xianchong, this study adds cultural specificity and theoretical richness to the global sociology of digital inequality. As such, we contribute to calls for more comparative and context-sensitive digital sociology (James, 2021; Li, 2022).

Lastly, we would like to mention that although the technological landscape has shifted dramatically with AI, the core sociological processes identified—emotional reassurance, intergenerational reciprocity, and cultural mediation—are not technology-specific. They represent structural and affective dynamics that influence digital adaptation regardless of whether the challenge is learning basic smartphone functions or navigating AI-driven interfaces.

Taken together, this study contributes to the digital divide literature by extending the discourse beyond technical access and skills to include emotional and social dimensions of digital literacy. Addressing the generational digital divide requires more than skills-focused literacy; it requires attention to the communicative relationships through which older adults gain confidence, interpret technological change, and sustain belonging. By fostering emotional reassurance, relational support, reciprocal learning, and family- and community-driven digital engagement, interventions can more effectively mitigate the generational digital divide.

Our findings have several practical implications. First, practitioners can develop targeted digital literacy programs for older adults that are tailored to their specific needs and learning styles. Second, practitioners can promote intergenerational learning initiatives that encourage younger and older generations to collaborate in learning digital skills.

LIMITATIONS AND FUTURE RESEARCH

The scope is geographically limited to a single rural village, which may affect the generalizability of the findings. Future research should aim to include multiple rural settings to provide a more comprehensive understanding. Another limitation concerns the temporal context: data were collected before the widespread integration of generative AI and algorithmic personalization into everyday digital life. While this constrains direct commentary on AI-specific practices, our findings offer a foundational sociological lens—emphasizing emotional and social digital literacy—that remains critical for understanding how older adults

adapt to emerging technologies. Lastly, in the Findings section, this study paid more attention to the perceptions and opinions of older adults than to the views of middle-aged adults and younger adults. This was mainly because the current study was more interested in older adults' perceptions and thoughts.

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