

Chapter 8

Information and Communication Technologies and the Risk to Loneliness



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8.1 Introduction

Loneliness is common among older people, especially as social contact declines. Friends and partners die, causing social networks to shrink (Aarts et al., 2015). We define loneliness as “the unpleasant experience that occurs when a person’s network of social relations is deficient in some important way, either quantitatively or qualitatively” (Perlman & Peplau, 1981, p. 31). Loneliness can, therefore, be considered the subjective feeling of lacking social contact. Social interaction is often maintained through digital tools—many times as a supplement to face-to-face contact. Thus, loneliness is closely linked to social contacts in real and digital life (Nowland et al., 2018).

The advent of digital technologies has significantly altered social interactions, influencing feelings of loneliness among both younger and older adults. Among younger adults, particularly those aged 15 to 24, excessive use of social media may ultimately lead to feelings of loneliness and isolation (Smith et al., 2021). Moreover, the adoption of contemporary digital instruments, such as social media applications, has been attributed to the tendency of social comparison and the perception of missing out on social events, which can intensify feelings of isolation. For older adults, digital technologies present both challenges and opportunities in regard to loneliness. While excessive internet use has been associated with anxiety and depression, moderate and purposeful engagement, such as using video calls and online communities, can enhance social connections and reduce feelings of isolation (Ruiz-Figueroa et al., 2025).

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Age alone is not a valid predictor of loneliness; nevertheless, during the COVID-19 pandemic, older adults, especially, experienced reduced contact and relied on the telephone, for example, to communicate with loved ones (Brooke & Jackson, 2020). Although older adults can maintain contact through digital solutions, such as chats or video telephony, not all of them have technical skills, internet access, or requisite digital tools (e.g., social messenger smartphone apps) and thus cannot compensate for a lack of physical contact with digital solutions (Seifert et al., 2021; Xie et al., 2020). Thus, with the penetration of digital services into everyday life, contemporary technology can help maintain contact and social interaction. Nevertheless, those who are not technology-savvy risk exclusion and feel particularly lonely in digital-dominated everyday life because they cannot or do not want to use technology-enabled means of communication (Seifert, 2020). This two-sided view leads to the central question of to what extent digitalization affects feelings of loneliness among older people, either positively or negatively. Therefore, this chapter aims to provide a literature and empirically based answer to this question, by discussing current insights and by analyzing data from a recently conducted survey among people living in Switzerland aged between 18 and 98.

8.2 Use of Information and Communication Technologies Among Older Adults

Information and communication technologies (ICTs) are everyday tools used to seek information and communicate, including the internet, smartphone messaging, and news apps on a tablet. ICT use may enable older individuals to live independently for a longer time by positively impacting health and social isolation (Czaja et al., 2018; Schulz et al., 2015). Web-connected ICT, such as using the internet via smartphones or tablets, provides new communication capabilities. Compared with non-web-connected ICTs (e.g., landline telephones), web-connected ICTs (e.g., social network apps on a smartphone) facilitate broader access to digital information and services. Research has shown that web-connected ICT has substantially changed people's lives by enabling new forms of social participation and interaction and by enhancing access to information (Antonucci et al., 2017; Castellacci & Tveito, 2018).

Even though the digital transformation of everyday life offers opportunities to enable, for instance, the maintenance of social contact over long distances or quick access to news, successful participation in a digital society requires individuals to adapt to evolving technological innovations and possess the knowledge to perform activities digitally (Seifert & Cotten, 2021). However, not all populations are familiar with or have adequate access to ICTs. This digital divide is a global phenomenon that encapsulates the perceived gap between those with access and those without it (Compaine, 2001). The literature on older adults has shown that younger groups worldwide are more familiar with the latest technologies than older groups.

Individuals aged 65 years and older, especially those aged 80 years and older, use modern web-connected ICT less often than younger groups (Hunsaker & Hargittai, 2018; Schlomann et al., 2020).

Compared to younger adults, who are often familiar with the latest technologies (e.g., smartphones, apps, and social media), older persons are less familiar with and skilled at using newer ICTs (e.g., smartphones, smartwatches, and virtual reality tools). Alongside age differences, sociodemographic characteristics (e.g., gender, education, and income), personal factors (e.g., technical skills and technological anxiety) and environmental factors, such as ICT infrastructure and the wealth of one's region, shape this digital gap (Brandtzæg et al., 2011; König & Seifert, 2023). A representative survey across the European Union showed that 53% of people aged 50 years or older used the internet (König & Seifert, 2020). The same study revealed that people older than 80 years spent less time online than younger older adults (65–79 years) and that men and adults with higher educational and economic status aged 50 years and older were more likely to use the internet. Furthermore, individuals' health, prior experience with technology, social salience (i.e., internet use among the members of one's social network), and contextual factors, such as country-specific wealth and communication technology infrastructure, are predictors of older adults' internet use.

The COVID-19 pandemic has highlighted the significance and persistence of the “digital divide,” fostering discussions about the positive and negative consequences of using or not using technology during periods of physical distancing. When physical distancing mandates were enacted during the COVID-19 pandemic, older adults—one of the most at-risk groups for COVID-19—could not interact with their social connections and were told to refrain from shopping, dining, and other outside activities. Older adults who could access ICTs could still maintain contact with social ties, buy food and groceries, and remain involved in organizations via a digital presence (e.g., many churches began broadcasting their services online). However, older adults on the wrong side of the digital divide with health and mobility limitations were likely to struggle with a “double burden of social exclusion” (Seifert et al., 2021). They could not compensate for their need for contact, for example, with their grandchildren, through digital solutions (e.g., modern ICT). Although ICT use may help older adults maintain social interaction and engagement, a sense of social exclusion and loneliness is likely for older adults who cannot access ICTs or lack the skills to use them (Robinson et al., 2020).

8.3 Potential for and Barriers to ICT Use Among Older Adults

ICT use has long been discussed in gerontological literature, as have the effects of technology on various aspects of life and well-being (Schulz et al., 2015; Wahl & Gerstorff, 2018). However, the results have been mixed, and the question of whether

and to what extent technologies can improve older people's lives cannot be unequivocally answered. Rather, there is evidence of potential but also of barriers to use (Seifert & Cotten, 2021). In this context, considering the ambivalent effects of technology for older adults is crucial. For instance, the findings on the impact of technology use on quality of life have also been mixed. Quintana et al. (2018) reported no effects on evaluative and hedonic psychological well-being, instead identifying a positive effect on eudaimonic psychological well-being. Lam et al. (2020) noted positive effects of daily internet and other technology use on life satisfaction, even though its use for information seeking was associated with lower life satisfaction.

In a Swiss survey, Seifert and Schelling (2018) established that many respondents viewed the internet as useful for staying in contact with others and for coping with everyday situations and that 53% of those aged 65 and older agreed with the statement that “the internet allows me to stay independent longer into old age.” These findings and those of other studies (Francis et al., 2019; Schlomann et al., 2020) suggest that the internet, a prime example of current ICT, could be a resource for facilitating everyday life by compensating for functional decline in old age. For example, instrumental ICT use—accessing services, information, or opportunities that may be unavailable through other means—has been associated with increased social engagement among older adults (Ihm & Hsieh, 2015).

In addition to the potential benefits of ICT, barriers to its use must be noted. For example, Swiss data (Seifert, 2022) revealed that the most common reasons for not using the internet were complexity of use (77%), security concerns (74%), and too much effort to learn (65%); however, over 60% of the respondents in each case stated that someone else was accessing information on the internet on their behalf (65%) or that they saw no personal benefit to using the internet (61%). The other reasons were less frequently cited, although a lack of support was also invoked by 37% of respondents as the reason for not using the internet. Only 20–29% of respondents cited cost and health problems (Seifert, 2022). There is also extensive research on the role of anxiety in older adults' technology use (Powell, 2013). Compared to younger adults, older adults are more likely to report being anxious about using technology, which has been considered relevant for explaining the digital divide between age groups.

8.4 The One Side of the Coin: Maintaining Social Contact via Modern ICT and Reducing Loneliness

Using current ICT, such as the internet, can be regarded as a resource for successful aging by providing older adults with an instrument to remain connected with and interact with the outside world (Hofer et al., 2019). However, research on the connection between older adults' internet use and their mental health has presented a mixed picture (Lam et al., 2020). Although some studies have shown negative associations between internet use and mental health (e.g., increases in anxiety or

depression because of internet use; Hofer & Hargittai, 2021), other studies have been more positive, indicating that internet use can counteract depression and loneliness (Cotten et al., 2014).

In this context, previous studies on the implications of internet use for mental health have focused on outcomes such as depression and anxiety, social support, or life satisfaction. Yet one of the key challenges regarding older adults' mental health, their rich lives, and their integration into society is the maintenance of social inclusion and the avoidance of loneliness. Modern ICT can enable new forms of social interaction, especially among older adults (Antonucci et al., 2017). Nevertheless, empirical evidence on the relationship between loneliness and ICT use in old age has been mixed.

Some studies have found that loneliness is reduced (Cotten et al., 2013; Szabo et al., 2019; Yu et al., 2021). For example, a German study (Schlomann et al., 2020) revealed a significant relationship between the use of web-connected ICT and three domains of subjective well-being: loneliness, anomie, and autonomy. The participants using ICT reported lower levels of loneliness and anomie and higher levels of autonomy.

In contrast, other studies have determined that the internet does not significantly impact perceived loneliness among older people (Aarts et al., 2015; Chen & Schulz, 2016; Slegers et al., 2008). These mixed results could be related to the question of whether interactions via ICT replace real-life social interactions, which might lead to greater loneliness. However, a review of social relations and technology concluded that technology is more likely to expand traditional forms of social interaction than replace them (Antonucci et al., 2017).

Regarding longitudinal studies on internet use and loneliness, a randomized controlled trial of an internet-based intervention for older adults reported a significant reduction in perceived loneliness for the intervention group at six months, but this effect was not maintained at 12 months (Czaja et al., 2018). Another longitudinal study found that internet use for social purposes was associated with decreased loneliness the following year, while informational and instrumental internet use was unrelated to loneliness (Szabo et al., 2019). A more recent study (Yu et al., 2021) using the US-based Health and Retirement Study provided evidence based on longitudinal data on the mediating effects of social contact that indicated an association between internet use and loneliness. The study found that internet use could increase the amount of social contact.

8.5 The Other Side of the Coin: Digitalization and the Risk of Perpetuating Loneliness and Social Exclusion

As described above, the current state of research on ICT use and loneliness has been mixed. Some studies have shown a reduction in loneliness, whereas others have shown no effect. A recent review concluded that although research reviews have

indicated that ICT can reduce loneliness and social isolation in older people, the causal confirmation has been limited, and evidence concerning innovative technologies, such as augmented reality systems, is scarce (Döring et al., 2022). Similarly, a UK study revealed weak associations between various online activities and loneliness but strong associations with social isolation (Stockwell et al., 2021), indicating that technology and technology-based interventions impact social interaction. Thus, technology can increase social interaction and reduce social isolation but cannot guarantee a direct impact on loneliness. Another review (Balki et al., 2022) on the effect of technological interventions on reducing loneliness concluded that technology improved social connectedness, but its effectiveness in lessening social isolation and loneliness depended on the study design and was improved by shorter durations and longer training periods. Notably, the relationship between technology use and loneliness depends on the technology and an individual's social situation.

Studies have also indicated that technology can negatively impact loneliness because technology use reduces face-to-face contact. Nowland et al. (2018) identified a complex relationship between loneliness and social internet use: When the internet serves as a tool to strengthen existing relationships or create new social connections, it can help reduce feelings of loneliness. However, when social technologies are used as a means of avoiding real-world social interactions, loneliness tends to increase. For older adults, there is an additional aspect: the non-use of digital tools. Not using for example, the internet (and digital tools) to maintain social contacts. People lacking technical skills or hardware cannot (a) enjoy the benefits of digital tools and (b) are likely to feel excluded from this digital social interaction.

For a long time, the nonuse or low use of digital technologies did not (or only to a limited extent) exclude individuals from satisfying their needs and interests because these could be achieved through widely available traditional means (e.g., in-person visitations). However, with digitalization becoming increasingly prevalent, people with few or no technical skills (among them mostly older adults) raise the question of whether the nonuse of modern technologies leads to social exclusion (Seifert & Rössel, 2019; Van Regenmortel et al., 2016). The link between the nonuse of digital technology and social exclusion is twofold. First, poor or nonuse may result in a lack of access to information and resources (e.g., goods and services) and, with this, the inability to participate in the normal daily activities available to most people (Walsh et al., 2017). For instance, as more service providers offer information and services on an online-only basis (or charge an additional fee for offline services), older adults who are not online may be increasingly disadvantaged in societal inclusion. Second, poor or no utilization of modern ICT can contribute to an increased risk of social exclusion and loneliness in old age (Reisdorf & Rhinesmith, 2020).

The increasing need to be digitally literate may contribute to a gradual loss of social integration among older adults with low or no technological skills who may no longer feel part of contemporary society. This phenomenon is known as perceived obsolescence (Brandtstädter & Wentura, 1994). In a representative German sample, 14% of older adults over the age of 60 had high levels of perceived

obsolescence, which increased with the absence of internet access, fewer ICT skills, and lower internet self-efficacy (Jokisch et al., 2022).

ICTs can also generate and perpetuate ageism, with older technology nonusers seen as frail or outsiders (Cutler, 2005). If societal inclusion means active participation in the digital world, then older adults who do not own a smartphone or are not active on the internet risk social exclusion. In a Swiss survey by Seifert et al. (2018), 14% of the respondents aged 65 and older who did not use the internet stated that their nonuse led to social exclusion.

8.6 Findings from a Swiss National Survey

8.6.1 Background and Research Methods

To further consider the relationship between the use of modern ICT and loneliness, we accessed existing data from Switzerland to study how digital and nondigital social interaction may affect loneliness. We explored whether associations between social interactions and loneliness differ by mode of social interaction, that is, online, or in person. We also examined feelings of closeness to family and friends when using online communication and in-person communication.

A simple random sample of the permanent resident population of Switzerland aged 18 years and older was chosen from the sample frame (registry dataset) of the Swiss Federal Statistical Office. Personalized invitations and two reminders were sent by mail. There were no restrictions on upper-level age, current internet use, nationality, or type of housing. From October 29 to December 17, 2019, 1604 people aged 18 years and older in all the language regions (German, French, and Italian) of Switzerland were interviewed. A computer-assisted web interviewing technique was used, which was supplemented by computer-assisted telephone interviews with people who lacked an internet connection or who did not use the internet. A standardized questionnaire with closed-ended questions was used. The average interview duration for the two methods was 41.8 minutes. A total response rate of 30.5% was achieved. The respondents' ages ranged from 18 to 98 years, with a mean age of 51.5 years ($SD = 17.86$).

Loneliness was measured via a short three-item loneliness scale (Hughes et al., 2004). Response categories ranged from 1 = *never* to 5 = *very often* ($M = 1.96$ and $SD = 0.80$). The loneliness scale ($\alpha = .83$; scores were summed) included the following questions: "How often do you feel that you lack companionship," "How often do you feel left out," and "How often do you feel isolated from others?" To measure preferred forms of communication we used the following question: "How do you mainly communicate with the following groups of people (own partners, own children, other family members, friends)? (in person, by telephone, digital (online))". To measure feelings of closeness to different social groups (partners, children, other family members, and friends) via offline (in person) or digital (online)

communication strategies, we added two questions measured on a 5-point scale (1 = *very distant* to 5 = *very close*): “When you communicate with the following groups of people in person, do you feel emotionally close or emotionally distant?” and “When you communicate with the following groups of people digital (online), do you feel emotionally close or emotionally distant?”

A set of control variables included the following sociodemographic variables: gender (1 = *female* and 0 = *male*), age (in years), education (1 = *primary level*, 2 = *secondary level*, and 3 = *tertiary level*), monthly household income (1 = *less than 4000 Swiss Francs [CHF]*, 2 = *CHF 4001–8000*, and 3 = *more than CHF 8000*), and living situation (1 = *living alone* and 0 = *not living alone*).

8.6.2 *Forms of Communication*

Descriptive analyses (see Table 8.1) showed that younger participants (18–64 years) and older participants (65–98 years) use mainly personal communication for contact to their partners, children and friends. For contact with children and other family members, older respondents use the telephone more often than younger respondents. For contact with friends, younger respondents are more likely to use digital communication tools in addition to face-to-face contact. For contact with family members (other than partner and own children) and friends, younger participants use digital communication tools more often than older participants.

8.6.3 *Feelings of Closeness Through Offline Versus Digital Contacts*

Descriptive analyses (see Table 8.2) showed that younger participants (18–64 years) reported higher levels of closeness when in face-to-face communication with children, family members, and friends than older participants (65–98 years). Older participants felt closer to their children, family members and friends when using digital communication tools than younger participants. However, when comparing face-to-face communication and digital communication within the 65–98 age group, older participants generally felt less close (lower feelings of closeness scores) to their children, family members, and friends when using digital communication tools (see Table 8.2).

We were also interested in the multivariate effect of closeness on loneliness when using digital communication tools. Employing linear regression models (one linear regression model for each category of social contacts; see Table 8.3) for people aged 65 years and older, controlling for age, gender, education, income, and living situation, the first model for feelings of closeness when using digital communication tools with children was not significant. The second model with other family

Table 8.1 Forms of communication (%)

Social groups Contact with mainly ...	Own partners		Own children		Other family members			Friends	
	18-64 Years	65-98 Years	18-64 Years	65-98 Years	18-64 Years	65-98 Years	18-64 Years	65-98 Years	
In person	86.5	89.8	83.6	48.4	40.1	28.9	42.1	41.8	
By telephone	7.0	7.4	7.6	35.4	38.7	58.8	19.9	36.7	
Digital (online)	6.4	2.8	8.8	16.2	21.1	12.3	38.0	21.5	

Table 8.2 Feeling of closeness by offline versus digital contacts

Social groups Contact with ...	Via communication in person		Via digital communications tools (online)	
	18–64 Years	65–98 Years	18–64 Years	65–98 Years
Own children	4.85** (0.46)	4.77** (0.51)	3.57*** (1.23)	3.89*** (1.10)
Other family members	4.62*** (0.70)	4.46*** (0.81)	3.52** (1.06)	3.69** (1.04)
Friends	4.53*** (0.72)	4.39*** (0.78)	3.52* (1.00)	3.65* (1.04)

Values shown are means and standard deviations (in brackets). Scale: 1 = *very distant* to 5 = *very close*. T test between age groups (* $p < 0.05$, ** $p < 0.01$, and *** $p < 0.001$)

Table 8.3 Linear regression models to predict loneliness depending on feelings of closeness using digital communication tools stratified by type of social relation (only people aged 65 and older)

65+ years	Model 1: Children	Model 2: Other Family Members	Model 3: Friends
	Loneliness		
Predictor	<i>Beta</i>	<i>Beta</i>	<i>Beta</i>
Age	.144*	.141*	.149*
Female (ref. male)	.045	.048	.062
Education	.054	.026	.052
Income	-.013	.002	.018
Lives alone (ref. does not live alone)	.099	.120	.145*
Feeling of closeness using digital communication tools with children	-.080	–	–
Feeling of closeness using digital communication tools with other family members	–	-.168**	–
Feeling of closeness using digital communication tools with friends	–	–	-.204***
Model Fit	$F(6) = 1.600$; N = 310; $p = .147$; corrected $R^2 = .013$	$F(6) = 2.406$; N = 351; $p = .019$; corrected $R^2 = .034$	$F(6) = 3.792$; N = 356; $p < .001$; corrected $R^2 = .059$

Note: * $p < 0.05$, ** $p < 0.01$, and *** $p < 0.001$

members was significant, revealing that, in addition to age, feelings of closeness were significantly associated with loneliness, whereas other independent variables were not. Thus, the older respondents who did not feel close to family members when they used digital communication tools were more likely to experience loneliness. The third model, with friends in the compared group, was significant, revealing that feelings of closeness, along with age and living alone, were significantly associated with loneliness. Thus, the older respondents who did not feel close to friends when using digital communication tools were more likely to experience

loneliness. These analyses revealed that people who feel disconnected while using digital tools for communication are more lonely when in contact with family members and friends.

8.7 Conclusion

Modern ICTs help older adults stay connected to their social networks, overcome functional limitations, remain mobile as they age, and actively participate in society through socializing, purchasing products, being entertained and accessing information. Although technologies enable contact with social groups, such as friends or family members, there is a risk that the increasing dependence on digital tools, especially for older people who are less tech savvy, will lead to a certain degree of non-participation in social interactions, thus feelings of loneliness. Our study from Switzerland indicated that older adults aged 65 and older use less often digital communication tools for the contact to family members and friends than younger adults (18–64 years old). But if older people use digital communication they feel closer to their children, family members, and friends than adults aged 18–64 years using digital communication. Also, older adults who felt disconnected using digital tools for communication with family members and friends were more lonely. While these results should be interpreted with caution due to their limitations (regional focus on Switzerland; no longitudinal data; data did not allow for a comprehensive social network analysis of loneliness; no distinction between different technologies for maintaining contact), they suggest that digital social interaction tools are still used cautiously, particularly by older adults, and are not necessarily preferred to face-to-face contact. The preliminary data exploration suggests that older adults utilize new digital communication tools less frequently than younger adults. This may be indicative of a reduced familiarity with these tools, potentially leading to a lower perceived dependency on them within their everyday live (e.g., there using in-person contacts mostly). Older adults often rely on personal contacts and phone calls to satisfy their need for social interaction. However, the analysis also reveals that, despite the increased use of digital communication by older individuals, they report feeling less connected to their interlocutors during these digital interactions compared to their in-person interactions. This heightened sense of digital disconnection can potentially exacerbate feelings of loneliness, as digital communication is used less frequently, potentially leading to a reduced overall number of interpersonal contact attempts. Therefore, it can be posited that a considerable number of older adults in contemporary society may benefit from maintaining a balanced integration of both digital and non-digital communication methods.

The evidence in the literature so far pointed to the ambivalent role of digital tools of communication in social interaction. Modern communication tools, such as internet-based applications, enable older adults to maintain social contact. Thus, they may reduce loneliness if it is linked to missing social contacts. Consequently, technology can help protect older adults from the risks of social isolation. However,

technology is only a tool and must be used wisely. For example, older adults must know who they can trust on the internet and what scams they may encounter. Therefore, in addition to technical hardware competence, literacy in the purposeful, responsible use of technological media is essential. Therefore, supporting older people who want to learn how to use modern technologies, for instance, by offering training courses or low-threshold peer-to-peer programs, is crucial (Cotten et al., 2016; Doh et al., 2015; Jokisch et al., 2020).

The relationship between digitalization and loneliness is complex and varies across age groups. For younger adults, while social media platforms offer avenues for connection, they can also lead to increased feelings of loneliness due to social comparison and reduced in-person interactions. Conversely, for older adults, digital tools like video calls and online communities can mitigate loneliness by facilitating social engagement, provided these technologies are used purposefully and not excessively. Addressing loneliness in the context of digitalization requires tailored approaches that consider the unique experiences of different age groups. Promoting digital literacy and encouraging meaningful online interactions can help maximize the benefits of technology while minimizing its potential drawbacks. Additionally, fostering offline social engagements remains crucial in combating loneliness across all demographics.

However, not all older adults are digitally savvy, and the resulting digital divide can promote digital inequality, resulting in the social exclusion of older adults unfamiliar with new technology. The literature review and analysis of Swiss data revealed that, along with the potential of technology use for maintaining social contact, older adults who were not technologically savvy felt excluded and, to an extent, lonely. However, the available data from Switzerland did not indicate longitudinal developments in the relationship between digital exclusion and loneliness. Thus, the question posed at the beginning of this chapter regarding the impact of ICT on loneliness cannot be answered conclusively. As is often the case, the answer is “it depends.” On the one hand, digitalization can prevent social isolation for those who are particularly tech savvy. On the other hand, there are risks, especially among those who are not tech savvy or wish to avoid new technology, of feeling marginalized and sometimes even more lonely.

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