Article

Examining Aspects of Digital Inclusion Among National Samples of US Older Adults

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Abstract

We live in a world where we are constantly connected to devices (e.g., smartphones, computers, tablets) and are encouraged to go online to find information about most things in society. This constant digital connection provides the means whereby many individuals communicate and exchange social support. For most demographic groups, this results in being online and connected to devices multiple times each day. Older adults have been slower to adopt and use emerging information and communication technologies (ICTs). Their digital divide in comparison to other age groups may not be an accurate representation of their technology use and the reasons for this use. This descriptive study examines this view of digital inclusion by focusing on older adults and their uses of technology. We provide an overview of technology usage by different older adult age groups in the United States using existing national-level data. We utilize life course and aging theoretical perspectives to help articulate how older adults use a wide variety of ICTs and whether they are constantly connected, and we note that while a constant connection to devices may be normative for younger age groups, this may not, and perhaps should not, be the case for older adults. The article concludes with a discussion of the social construction of digital inclusion and emphasizes the significant variation that exists in this construct, measurement of technology use in large-scale datasets, and variation in technology use across older adult life course groups.

Issue

This article is part of the issue "Expanding the Boundaries of Digital Inclusion: Perspectives From Network Peripheries and Non-Adopters" edited by Rob McMahon (University of Alberta), Nadezda Nazarova (Nord University Business School), and Laura Robinson (Santa Clara University).

1. Introduction

Digital inclusion is a complex construct that focuses on whether individuals and groups have equitable access to and use information and communication technologies (ICTs) such as smartphones, computers, tablets, and the Internet (Siefer, 2016). Most conceptualizations of digital inclusion include elements of access to, use of, and skills to use ICTs. Some also incorporate a type of connection as well as access to and quality of technical support (Reisdorf & Rhinesmith, 2020). ICT access, ownership, and use in the US has continued to rise. The majority of children (95%, 3–18 years; US Department of Education [US DOE], 2021) and adults (77%, aged 18 and older; Pew Research Center, 2021) have broadband Internet at home. Most community-dwelling adults (93%, 18 years and older) use the Internet (Faverio, 2022). ICT ownership has also increased. In 2021, most children (8–18 years) reported having a computer (87%), smartphone (94%), and tablet computer (74%) in their homes (Rideout et al., 2022). Similarly, the majority of adults (18 years and older) reported having a smartphone (87%) and tablet computer (53%; Faverio, 2022).

With the increase in ICT access and ownership, it is not surprising that ICT use has become ingrained in many areas of life. ICTs are used in education to facilitate

learning (Dore & Dynia, 2020; US DOE, 2019). For working adults, email and Internet use are vital to job success (Purcell & Rainie, 2014). ICTs are used to complete day-to-day tasks (Marist Poll, 2018) and for leisure activities (Editorial Unit, 2021; Rideout et al., 2022). We can find information about most things in society through ICT use. For example, most US adults (52%) prefer to get their news from a digital platform like a news website, online search, or social media sites (Shearer, 2021). Importantly, the spread of ICTs has changed how we communicate and exchange social support. Mobile phones, in particular, enhance communication between social ties, whether via voice, text messaging, or social media use (Anderson et al., 2022).

Both media and researchers have recently begun commenting on individuals being "constantly connected." Constant connection refers to the state of being always connected to a mobile or Internet-enabled device, which permits the user to be able to access online platforms, communicate with others in real time, and consume digital content on demand. It does not connote that individuals have to be using devices constantly; rather, it is the potential connection that they have given their mobile or Internet-enabled devices. Research on ICT use has evolved to understand the degree to which people are constantly connected to their ICTs; the frequency of daily ICT use is often used to assess whether individuals are constantly connected. For example, Internet use has increased to the extent that the majority of teenagers (89%, 13–17 years) and adults (84%, 18 years and older) go online at least several times per day or more (Anderson & Jiang, 2018; Faverio, 2022). In fact, 45% of US teenagers (13–17 years) and 33% of US adults (18 years and older) report being online almost constantly (Anderson & Jiang, 2018; Faverio, 2022).

Although ICT access, ownership, and usage have increased for children and adults, there are notable differences found between the adult age groups, with a smaller percentage of those aged 65 and older reporting ownership and use of ICTs (Cotten et al., 2017; Faverio, 2022; Kadylak & Cotten, 2021; Perrin, 2021). Though it may be becoming normative for some age groups to report being online constantly or to be "constantly connected," we examine whether this is the case for older adults across three US national samples of older adults, which few other researchers have done. We provide a more wide-ranging descriptive epidemiology of ICT access and use than previously found in research focused on older adults.

2. Older Adults and Their Use of ICTs

Older adults (65 years and older) have increased their types and frequency of ICT use, along with the range of online activities in which they engage over time. Most community-dwelling older adults own a smartphone (61%), have Internet at home (64%), and use the Internet (75%); almost half (45%) use social media (Faverio, 2022).

Eight percent of community-dwelling older adults report being constantly connected to the Internet (Faverio, 2022). However, the digital divide still exists due to sociodemographic and technology-related factors. For example, higher Internet use has been found for older adults who are White (Anderson et al., 2019; Choi et al., 2022), male (e.g., Gell et al., 2015; Nayak et al., 2010; van Deursen & van Dijk, 2015), more affluent (Anderson et al., 2019), more educated (Anderson et al., 2019), those who reside in urban locations (Anderson et al., 2019; Choi et al., 2022), and those who are employed (Niesel & Nili, 2021; Schuster & Cotten, 2022). Most notably, the digital divide continues to prevail between the older adult age cohorts. "Younger" older adults (65–74 years) have more Internet and social media knowledge (Hargittai et al., 2019), Internet use (Anderson et al., 2019; Hargittai & Dobransky, 2017), and breadth of online use (DiMaggio et al., 2004; Leukel et al., 2023; Olsson et al., 2019; Seifert & Cotten, 2020) compared to "older" older adults (75 years and older).

3. Theoretical Perspective

We can further understand older adults' ICT use and preferences for connection from the socioemotional selectivity theory (SST) life course perspective, which suggests that social motivational priorities change based on how much time one has left to live (Carstensen, 1993, 1998, 2006). Older adults, in contrast to those younger, tend to be more cognizant of their time constraints and focus on present-oriented goals by avoiding negative emotions, finding meaning in life, and preserving significant relationships. Older adults' online social networks may become smaller to reflect age-related goal shifts (J. Chang et al., 2015; Pfeil et al., 2008); however, there may be an increase in the quality of individuals in online social networks (e.g., actual friends) and perhaps less quantity (P. F. Chang et al., 2015).

Another way to interpret older adults' ICT use and preferences for connection is through the uses and gratifications theory (UGT), which suggests that individuals intentionally choose and use technology to satisfy their five personal needs: cognitive, affective, personal integrative, social integrative, and mental escape (Katz et al., 1973). The UGT has been extended to newer uses like social media by older adults, and researchers have identified new gratifications. Older adults use social media to fulfill their social integrative needs for strengthening social relationships with family and friends (Jung et al., 2017; Sheldon et al., 2021). Older adults also use social media as a mental escape for diversion and entertainment purposes (Sheldon et al., 2021). Others satisfy their affective needs by using social media to alleviate feelings of loneliness (Aarts, 2018; Baecker et al., 2014; Sinclair & Grieve, 2017) or to meet their social integrative needs by creating content on Instagram (McGrath, 2018) and TikTok (Ng & Indran, 2022) that challenges negative stereotypes of aging.

Older adults' ICT ownership and use has substantially increased in the past decade compared to younger age cohorts (Faverio, 2022). There is also heterogeneity among older adults in these patterns as well as nuances in the specific types of use. Guided by SST and UGT, we descriptively examine older adults' ICT ownership, types, and frequency of use to assess whether rates of use in general and aspects of constant connection among different segments of older adults vary.

4. Methods

We descriptively compare ICT ownership and use by US community-dwelling older adults using data from three national studies that include measures of ICT use.

4.1. Qualtrics Survey of Older Adults

A cross-sectional online survey conducted by the second author was used to collect data on US older adults (aged 65 and older) in 2017 on their ICT use (N = 1,260). Participants were recruited through Qualtrics panels using quota sampling based on the demographic characteristics of the 2010 US Census characteristics for individuals aged 65 and older based on age, race, sex, and education. The online survey took approximately 15 minutes to complete. Prior to the start of the survey, participants provided informed consent. This study was reviewed and approved by the university's Institutional Review Board.

ICT use was measured by asking: *Do you use [a desktop computer, laptop or notebook computer, tablet computer, or cell/mobile phone]?* Responses could be *yes* or *no*. Participants who responded *yes* were then asked: *Is your cell/mobile phone a smartphone?* Responses could be *yes* or *no*. Frequency of weekly Internet use was measured by asking: *In a typical week, how often do you go online?* Response options ranged from *less than once a week* to *almost constantly*. Frequency of online activities was measured by asking: *On average, how often do you go online for activities such as health, financial, social, and leisure?* Response options ranged from *never* to *several times a week*.

4.2. National Health and Aging Trends Study

The National Health and Aging Trends Study (NHATS) examines late-in-life trends with a nationally representative sample of older adults (65 years and older) in the US. This study is supported by the National Institute on Aging and is led by the Johns Hopkins University Bloomberg School of Public Health and the University of Michigan's Institute for Social Research, with data collection by Westat. Data collection started in 2011 and is collected annually through in-person or phone interviews with older adults and/or proxy respondents on their mental and physical function. Information about the sample design, data collection procedures, and

questionnaires can be found on the NHATS website (http://www.NHATS.org). For this study, we analyzed wave 11 data (2021) from community-dwelling older adults (N = 3,321).

ICT ownership was measured by asking: *Do you have a working cellphone? Do you have a working computer in your home? Do you have a tablet computer like an iPad that works by touching the screen?* Responses could be *yes* or *no*. For computer and tablet, there was the additional response of *yes, but I don't know how to use it*. The use of email or text messages was measured by asking: *In the last month, have you ever sent messages by email or texting?* Responses could be *yes* or *no*. This was followed by asking: *In the last month, how often did you send messages by email or texting?* Response options included *most days*, *some days*, and *rarely*. Internet use was measured by asking: *In the last month, besides email or texting, have you ever gone on the Internet or online for any [other] reason?* Responses were *yes* or *no*. Types of Internet use were measured by asking: *In the last month, have you gone on the Internet or online to [shop for groceries or personal items, pay bills or do banking, order or refill prescriptions, visit social network sites, and to visit with family or friends on video calls]? In the last year, have you gone on the Internet or online to [contact any of your medical providers, handle Medicare or other insurance matters, get information about your health conditions, and have a visit with medical providers]?* Response options for all types of Internet use were *yes* or *no*.

4.3. US Health and Retirement Study

The US Health and Retirement Study (HRS) is a panel survey of US adults aged 50 and older and their spouses. This study is supported by the National Institute on Aging and Social Security Administration and is led by the University of Michigan's Institute for Social Research. Data collection started in 1992 and has been repeated biannually. Interviews are conducted face-to-face, by telephone, or on the web. Participants are asked about issues pertinent to aging such as health, social relationships, and employment. We used the most recent wave of data (2020), collected between March 2020 and May 2021, with community-dwelling older adults aged 65 and older (N = 2,610). Information about the sampling strategy, panel design, and questionnaires can be found on the HRS website (http://hrsonline.isr.umich.edu).

ICT ownership was measured by asking: *Which of the following devices do you own or have access to?* Devices included desktop computer, iPad or other tablet, laptop computer, smartphone, regular cell phone, e-reader, wearable device, home assistant, smart home technology/security, and smart TV/streaming service. Responses were *yes* or *no* for each device. Internet use was measured by asking: *Yesterday did you use a computer or the Internet?* Responses were *yes* or *no*. Those who responded *yes* were then asked: *How much time did*

you spend doing this? Response options ranged from *less than 1 hour* to *7 or more hours*. Frequency of Internet use was also measured by one item: *How often do you use a computer for e-mail, Internet, or other tasks?* Response options ranged from daily to never/not relevant. Frequency of online activities was measured by asking, *how often do you use one or more of the devices to do any of the following activities?* Activities included health, financial, social, and leisure. Response options ranged from *daily* to *never/not relevant*. Activity use for each activity was measured by summing daily, several times a week, at least once a month, and at least once a year.

4.4. Data Analysis

Age in all three datasets was divided into three groups: young-old (65–74 years), old-old (75–84 years), and oldest-old (aged 85 and older). Data were analyzed descriptively and compared by age group and between datasets.

5. Results

5.1. Participant Characteristics

Most of the participants, across the three datasets, were female, White, and married or living with a partner. See Table 1 for participant characteristics.

5.2. ICT Access, Ownership, and Use

In the HRS 2020 sample, most device ownership decreased with age. Most young-old owned or had access to a smartphone (82%), desktop computer (59%),

tablet (61%), laptop (59%), or smart TV/streaming device (59%), whereas, fewer old-old owned smartphones (60%) or desktop computers (52%). Cellphone ownership increased with age, with most of the oldest-old owning a cellphone (55%), compared to 28% of the young-old. Device use also largely decreased with age. Of the Qualtrics 2017 data, more young-old used laptops (69%), smartphones (64%), or tablets (46%), compared to the oldest-old who had less laptop (57%), smartphone (43%), or tablet (37%) use. However, desktop computer (69%) or cellphone (39%) use was higher among the oldest-old compared to young-old desktop computer (54%) or cellphone (24%) use. See Figures 1 and 2 for ICT ownership and use.

Across the age cohorts (and the three datasets), the majority of the young-old and old-old were Internet users. For the oldest-old, the Qualtrics sample (82%) had double the rate of Internet users compared to the other two datasets (NHATS: 41%, HRS: 39%). See Figure 3 for Internet users. Given the Qualtrics study was a sample of older adults who were Internet users, it is not surprising that the rates reported from the Qualtrics sample are higher than those from the NHATS and HRS samples. From the Qualtrics data, most young-old (59%), old-old (57%), and oldest-old (60%) are going online several times a day. The percentages were lower for reporting they go online "almost constantly" in the Qualtrics sample: 19% (young-old), 11% (old-old), and 10% (oldest-old). Neither the HRS nor the NHATS included measurement of constant use of the Internet. For both the Qualtrics and the HRS samples, most respondents reported 2–3 hours of Internet use per day. See Table 2 for Internet use results.

Table 1. Participant characteristics.

	Qualtrics 2017 (*N* = 1,260)			NHATS 2021 (*N* = 3,321)			HRS 2020 (*N* = 2,610)		
	65–74 years	75–84 years	85+ years	65–74 years	75–84 years	85+ years	65–74 years	75–84 years	85+ years
	n = 731	*n* = 365	*n* = 164	*n* = 440	*n* = 1,803	*n* = 1,078	*n* = 1,344	*n* = 959	*n* = 307
Gender									
Female	61%	55%	35%	52%	58%	61%	58%	59%	60%
Male	39%	45%	64%	48%	42%	39%	42%	41%	40%
Race/Ethnicity									
White	76%	93%	99%	69%	71%	73%			
African American	14%	3%	0%	21%	21%	19%			
Other	10%	4%	2%	10%	9%	8%			
Relationship Status									
Married/Partnered	54%	51%	55%	59%	50%	30%	63%	55%	35%
Divorced/Separated	21%	14%	8%	20%	17%	8%	17%	11%	11%
Widowed	15%	32%	37%	16%	30%	60%	14%	31%	51%
Single/Never Married	10%	4%	1%	5%	4%	3%	6%	3%	3%

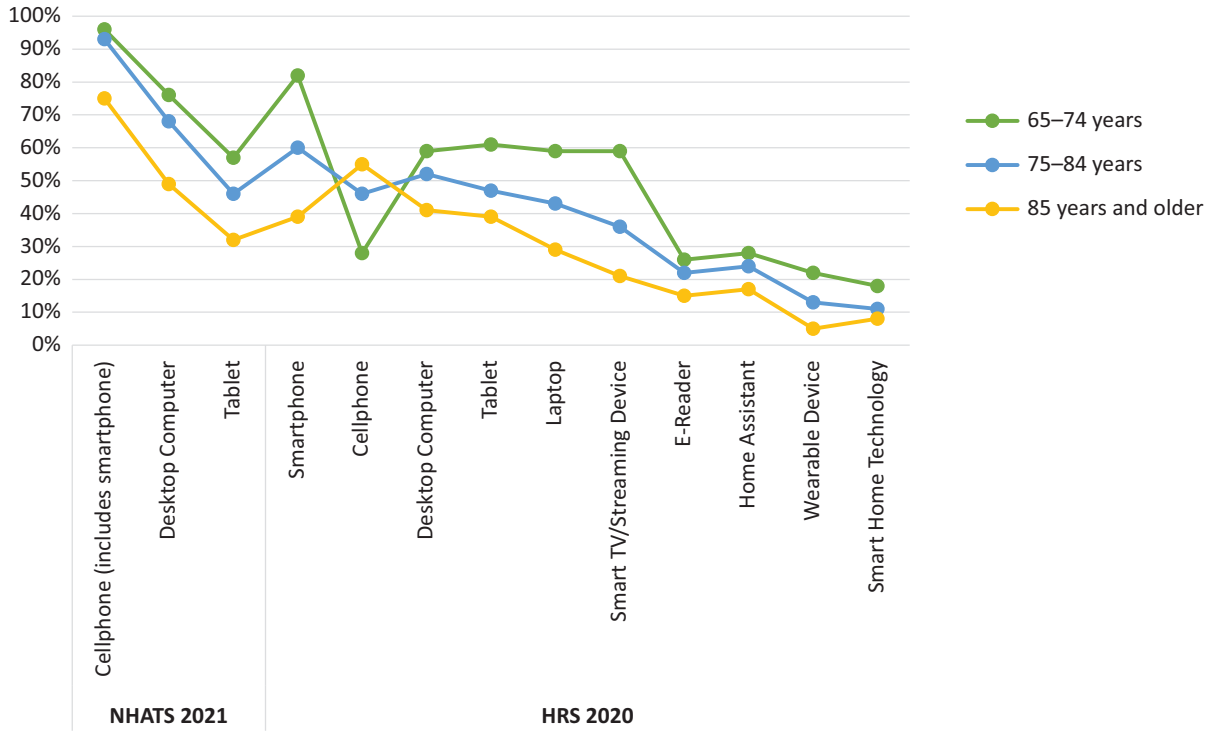Note: HRS race/ethnicity not publicly available.

Figure 1. ICT ownership by older adult age groups.
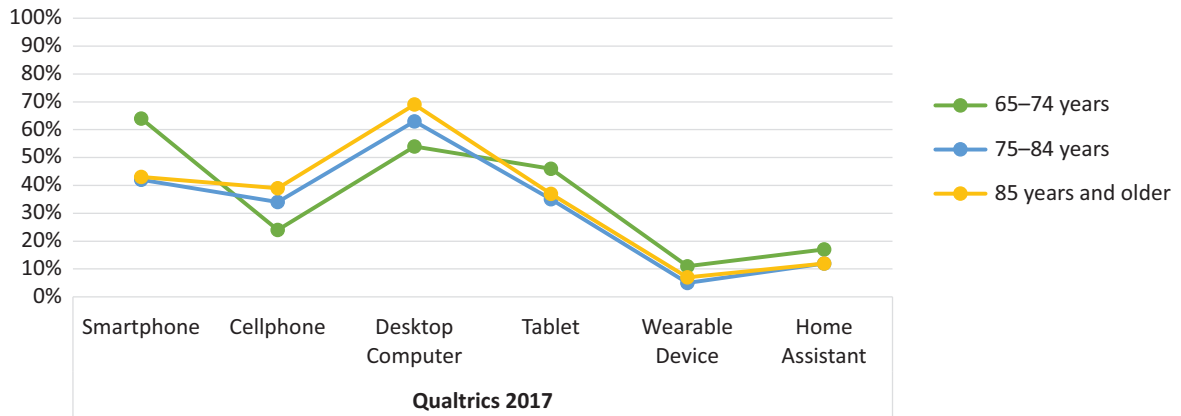

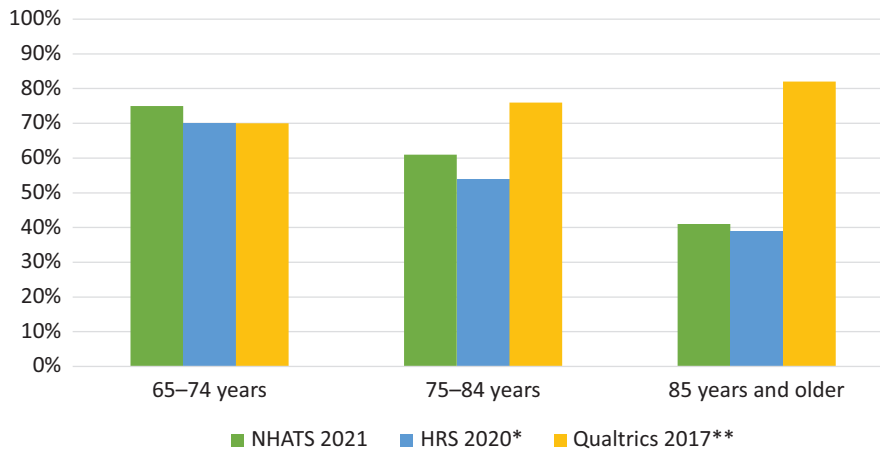**Figure 2.** ICT use by older adult age groups.

Figure 3. Internet users. Notes: * Internet use in the previous day; ** Internet use for 10 or more years.

Table 2. Internet use.

		65–74 years (Young-old)	75–84 years (Old-old)	85+ years (Oldest-old)
Frequency of Internet use	Qualtrics 2017			
	Daily	95%	94%	94%
	Almost constantly	19%	11%	10%
	Several times per day	59%	57%	60%
	About once per day	17%	26%	24%
	About 1 or 2 times a week	3%	3%	4%
	Less than once a week	2%	3%	2%
	HRS 2020			
	Daily	74%	70%	63%
	Several times a week	13%	14%	18%
	Once a week	3%	3%	5%
	Several times a month or less	10%	13%	14%
Average daily online use	Qualtrics 2017			
	Less than 1 hour	2%	2%	2%
	1 hour	10%	14%	19%
	2–3 hours	31%	32%	48%
	4–6 hours	31%	30%	21%
	7 or more hours	26%	22%	11%
	HRS 2020			
	Less than 1 hour	18%	20%	31%
	1 hour	32%	32%	23%
	2–3 hours	37%	37%	41%
	4–6 hours	9%	9%	5%
	7 or more hours	4%	2%	0%

Note: Qualtrics daily frequency is the sum of the three daily responses.

5.3. ICT Activities and Frequency of Activities Online

5.3.1. Shopping or Purchasing Services

Across the age cohorts, the majority of older adults do not order food or groceries (HRS: 65–74 years: 62%, 75–84 years: 75%, 85 years and older: 76%), buy tickets for events or reserve tables at restaurants (HRS: 65–74 years: 62%, 75–84 years: 78%, 85 years and older: 91%), or request ride-hailing services (HRS: 65–74 years: 82%, 75–84 years: 91%, 85 years and older: 94%) online (see Table 3). Young-old (HRS: 77%, NHATS: 61%) and old-old (HRS: 60%, NHATS: 53%) reported shopping online more than the oldest-old did (HRS: 40%, NHATS: 48%).

5.3.2. Day-to-Day Information

Regardless of the age cohort, most older adults are not going online to track their steps, exercise, or for personal fitness (HRS: 65–74 years: 57%, 75–84 years: 70%, 85 years and older: 69%), to apply for jobs (HRS: 65–74 years: 95%, 75–84 years: 99%, 85 years and

older: 99%), or to use a home assistant such as Amazon Echo (Alexa) or Google Home (HRS: 65–74 years: 64%, 75–84 years: 70%, 85 years and older: 77%; see Table 3). Most older adults, regardless of age cohort, are going online to write notes, take surveys, or fill out forms; use an alarm clock, timer, or calendar reminder; search for information on things like recipes or hobbies; and for information about the news or weather. The majority of young-old and old-old go online to check the weather daily (HRS: 58%, 52%) and to get news and updates on other information several times a week or more (HRS: 73%, 60%).

5.3.3. Medical or Health

Most older adults are going online to get health information (HRS: 65–74 years: 84%, 75–84 years: 75%, 85 years and older: 67%) for themselves (Qualtrics: 65–74 years: 76%, 75–84 years: 76%, 85 years and older: 79%) and for others (Qualtrics: 65–74 years: 60%, 75–84 years: 51%, 85 years and older: 51%). The majority of older adults are going online at least once per month or more to search for health-related information (HRS: 65–74 years: 69%,

75–84 years: 58%, 85 years and older: 53%). However, most older adults do not go online to purchase or manage their health insurance or Medicare accounts (HRS: 65–74 years: 74%, 75–84 years: 82%, 85 years and older: 89%; NHATS: 65–74 years: 77%, 75–84 years: 80%, 85 years and older: 82%). When combining several medical activities online such as going online to talk to a doctor or other medical professional, make medical appointments, order prescriptions, or receive personal health care advice, most older adults do these activities (HRS: 65–74 years: 84%, 75–84 years: 73%, 85 years and older: 66%). However, when examining the activities as separate activities, the results vary. Most older adults do not go online to make doctors' appointments (Qualtrics: 65–74 years: 74%, 75–84 years: 75%, 85 years and older: 71%), to order or refill prescriptions (NHATS: 65–74 years: 57%, 75–84 years: 60%, 85 years and older: 60%), or to have telehealth visits (NHATS: 65–74 years: 53%, 75–84 years: 59%, 85 years and older: 68%).

5.3.4. Managing Finances

Going online to pay bills and do banking is common among most young-old and old-old respondents (NHATS: 70–74 years: 73%, 75–84 years: 57%). When "send or receive money" was added to the question, more young-old and old-old go online to do banking, pay bills, and/or send or receive money (HRS: 65–74 years: 75%, 75–84 years: 61%). Of the age cohorts, the oldest-old age group (Qualtrics: 55%) reported going online several times a month or more to check financial information compared to young-old (Qualtrics: 47%) and old-old (Qualtrics: 52%). Most older adults do not go online to manage their Social Security account (Qualtrics: 65–74 years: 70%, 75–84 years: 80%, 85 years and older: 80%).

5.3.5. Social

The majority of older adults go online for instant messaging, text messaging, or emailing (HRS: 65–74 years: 88%, 75–84 years: 70%, 85 years and older: 51%). Almost all older adults report going online to send or receive emails (Qualtrics: 65–74 years: 97%, 75–84 years: 96%, 85 years and older: 99%), with most reporting that they go online several times a week or more for emailing (Qualtrics: 65–74 years: 76%, 75–84 years: 72%, 85 years and older: 85%). The majority of older adults do not go online to use instant messaging or other chat programs (e.g., WhatsApp; Qualtrics: 65–74 years: 51%, 75–84 years: 63%, 85 years and older: 68%; HRS: 65–74 years: 75%, 75–84 years: 86%, 85 years and older: 94%). Most young-old go online to video chat with family or friends (HRS: 63%, NHATS: 51%) and to read or post on blogs (Qualtrics: 51%, HRS: 62%). Many young-old go online at least once a month or more to video chat (HRS: 48%) and blog (HRS: 55%), whereas the majority of old-old and oldest-old do not go online

to video chat (75–84 years: HRS: 53%, NHATS: 52%; Qualtrics: 74%; 85 years and older: HRS: 66%, NHATS: 51%; Qualtrics: 68%) or to blog (75–84 years: HRS: 54%, Qualtrics: 53%; 85 years and older: HRS: 71%, Qualtrics: 56%). The majority of young-old (NHATS: 63%; Qualtrics: 74%) and old-old (NHATS: 55%; Qualtrics: 70%) go online to visit social network sites.

5.3.6. Leisure

The majority of young-old and old-old are going online to visit/"surf" websites (Qualtrics: 65–74 years: 91%, 75–84 years: 88%; HRS: 65–74 years: 82%, 75–84 years: 63%) and are doing this several times a week or more (Qualtrics: 65–74 years: 55%; HRS: 65–74 years: 70%, 75–84 years: 51%). Most young-old and old-old are playing games online (Qualtrics: 65–74 years: 58%, 75–84 years: 55%; HRS: 65–74 years: 67%, 75–84 years: 59%). See Table 3 for ICT activities results.

5.4. Internet Use Benefits

Across the age cohorts, most agreed that using the Internet made it easier to remain connected with others (e.g., reach people, stay in touch, feel connected to friends and family, feel less isolated, and increase the quantity and quality of communication with others). Most young-old and old-old agreed (Qualtrics: 51%, 52%) that using the Internet made it easier to meet new people; however, 68% (Qualtrics) of the oldest-old disagreed. See Table 4 for more information on the benefits of Internet use.

6. Discussion

Guided by SST and UGT, we examined ICT access and use (aspects of digital inclusion) for older adults and how they may vary across older adult age groups. We examined these topics across three US national samples of older adults—which few other researchers have done—providing a more extensive descriptive epidemiology of ICT access and use than exists in prior research. We found that older adults, as a cohort, own and use different types of ICTs, such as desktop computers, laptops, or cellphones (including smartphones). They use these ICTs for various purposes online, such as searching for information, banking, medical/health reasons, and for socializing. Many older adults go online daily, although there are variations depending on the dataset/sample and the type and frequency of activities they do online. However, for older adults, we don't see the same levels of access and use as have been previously reported for younger groups and adults in general (Faverio, 2022).

Most of the older adults in these studies reported spending an average of 2–3 hours online per day (Qualtrics, HRS), but few reported being constantly connected (Qualtrics: 65–74 years: 19%, 75–84 years: 11%,

Table 3. ICT activities.

Qualtrics 2017	65–74 years	75–84 years	85+ years	HRS 2020	65–74 years	75–84 years	85+ years	NHATS 2021	65–74 years	75–84 years	85+ years
Shop or Purchase Services											
Shop or order products or services	**85%**	**82%**	**84%**	Make a purchase or shop	**77%**	**60%**	**40%**	Shop for groceries or personal items	**61%**	**53%**	**48%**
Several times a week or more	13%	9%	10%	Daily	3%	1%	1%				
About once a week	17%	11%	15%	Several times a week	18%	12%	5%				
Several times per month	18%	19%	13%	At least once a month	38%	30%	18%				
Once per month or less	36%	44%	46%	At least once a year	19%	16%	16%				
				Order food or groceries for pick up or delivery	**38%**	**25%**	**24%**				
				Daily	1%	1%	1%				
				Several times a week	7%	6%	6%				
				At least once a month	21%	13%	10%				
				At least once a year	10%	6%	6%				
				Buy event tickets or reserve a table at a restaurant	**38%**	**22%**	**9%**				
				Daily	0%	0%	0%				
				Several times a week	1%	0%	0%				
				At least once a month	9%	7%	2%				
				At least once a year	28%	14%	7%				
				Request a ride via an app (e.g., Uber, Lyft)	**18%**	**9%**	**6%**				
				Daily	0%	1%	0%				
				Several times a week	1%	0%	1%				
				At least once a month	3%	2%	1%				
				At least once a year	14%	7%	4%				

Table 3. (Cont.) ICT activities.

Qualtrics 2017	65–74 years	75–84 years	85+ years	HRS 2020	65–74 years	75–84 years	85+ years	NHATS 2021	65–74 years	75–84 years	85+ years
Medical or Health											
Health-related information for self	**76%**	**76%**	**79%**	Get health information	**84%**	**75%**	**67%**	Personal health information	**54%**	**53%**	**45%**
Several times a week or more	4%	4%	5%	Daily	10%	6%	5%				
About once a week	6%	8%	7%	Several times a week	23%	17%	16%				
Several times per month	10%	14%	11%	At least once a month	36%	35%	32%				
Once per month or less	55%	50%	57%	At least once a year	17%	17%	14%				
Health-related information for others	**60%**	**51%**	**51%**								
Several times a week or more	1%	2%	2%								
About once a week	3%	4%	2%								
Several times per month	7%	7%	6%								
Once per month or less	48%	37%	39%								
Sign up for health insurance	**25%**	**21%**	**22%**	Buy or manage insurance online	**26%**	**18%**	**11%**	Medicare or other insurance	**23%**	**20%**	**18%**
Several times a week or more	1%	1%	0%	Daily	0%	0%	0%				
About once a week	1%	1%	1%	Several times a week	0%	0%	0%				
Several times per month	2%	2%	1%	At least once a month	7%	4%	2%				
Once per month or less	20%	17%	22%	At least once a year	19%	13%	8%				
Manage Medicare account	**30%**	**27%**	**31%**								
Several times a week or more	1%	1%	2%								
About once a week	2%	2%	1%								
Several times per month	3%	1%	3%								
Once per month or less	25%	24%	24%								

Table 3. (Cont.) ICT activities.

Qualtrics 2017	65–74 years	75–84 years	85+ years	HRS 2020	65–74 years	75–84 years	85+ years	NHATS 2021	65–74 years	75–84 years	85+ years
Medical or Health											
Make a doctor's appointment	**26%**	**25%**	**29%**	Talk to doctor or other medical professional, make medical appointments, order prescriptions, or receive personal health care advice	**84%**	**73%**	**66%**	Contact medical providers	**52%**	**41%**	**37%**
Several times a week or more	1%	1%	0%	Daily	2%	2%	1%	Order or refill prescriptions	**43%**	**40%**	**40%**
About once a week	2%	1%	1%	Several times a week	7%	6%	8%	Telehealth	**47%**	**41%**	**32%**
Several times per month	3%	2%	3%	At least once a month	44%	41%	32%				
Once per month or less	21%	21%	25%	At least once a year	31%	24%	24%				
Managing Finances											
Check financial information (e.g., stock quotes, banking, retirement plan)	**69%**	**71%**	**75%**	Do banking, pay bills, send or receive money	**75%**	**61%**	**48%**	Pay bills or do banking	**73%**	**57%**	**47%**
Several times a week or more	23%	24%	33%	Daily	7%	7%	6%				
About once a week	13%	14%	13%	Several times a week	28%	18%	16%				
Several times per month	11%	14%	9%	At least once a month	37%	32%	23%				
Once per month or less	22%	19%	21%	At least once a year	3%	4%	3%				
Complete financial transactions	**65%**	**59%**	**66%**								
Several times a week or more	10%	9%	16%								
About once a week	13%	11%	9%								
Several times per month	16%	18%	14%								
Once per month or less	26%	22%	28%								
Manage Social Security account	**30%**	**20%**	**20%**								
Several times a week or more	2%	1%	1%								
About once a week	1%	1%	2%								
Several times per month	2%	2%	1%								
Once per month or less	25%	17%	16%								

Table 3. (Cont.) ICT activities.

Qualtrics 2017	65–74 years	75–84 years	85+ years	HRS 2020	65–74 years	75–84 years	85+ years	NHATS 2021	65–74 years	75–84 years	85+ years
Social											
Use instant messaging or chat programs	**49%**	**37%**	**32%**	Send or receive instant or text messages or emails	**88%**	**70%**	**51%**	Send or receive emails or texts	**81%**	**68%**	**45%**
Several times a week or more	18%	12%	8%	Daily	56%	35%	19%	Most days	68%	61%	48%
About once a week	7%	5%	2%	Several times a week	23%	24%	18%	Some days	22%	24%	30%
Several times per month	9%	5%	9%	At least once a month	7%	9%	10%	Rarely	10%	15%	22%
Once per month or less	15%	15%	13%	At least once a year	2%	2%	4%				
Send or receive an e-mail	**97%**	**96%**	**99%**	Use chat apps (e.g., WhatsApp, Snapchat)	**25%**	**14%**	**6%**				
Several times a week or more	76%	72%	85%	Daily	6%	3%	1%				
About once a week	9%	10%	5%	Several times a week	6%	4%	2%				
Several times per month	6%	6%	7%	At least once a month	7%	3%	2%				
Once per month or less	6%	7%	2%	At least once a year	6%	5%	2%				
Make video phone calls (e.g., Skype, FaceTime)	**28%**	**26%**	**32%**	Connect face-to-face with family and friends using an app	**63%**	**47%**	**34%**	Visit with family or friends on video calls	**51%**	**48%**	**49%**
Several times a week or more	4%	4%	2%	Daily	6%	3%	4%				
About once a week	5%	2%	4%	Several times a week	15%	10%	5%				
Several times per month	5%	3%	4%	At least once a month	27%	20%	12%				
Once per month or less	14%	17%	22%	At least once a year	15%	14%	13%				
Participate in groups emails	**34%**	**29%**	**30%**								
Several times a week or more	8%	7%	7%								
About once a week	7%	5%	4%								
Several times per month	6%	4%	7%								
Once per month or less	14%	13%	13%								

Table 3. (Cont.) ICT activities.

Qualtrics 2017	65–74 years	75–84 years	85+ years	HRS 2020	65–74 years	75–84 years	85+ years	NHATS 2021	65–74 years	75–84 years	85+ years
Social											
Read or post to a blog	**51%**	**47%**	**44%**	Write or read blogs, reviews, ratings, or comments	**62%**	**46%**	**29%**				
Several times a week or more	19%	16%	10%	Daily	19%	12%	5%				
About once a week	10%	10%	10%	Several times a week	20%	16%	11%				
Several times per month	8%	8%	7%	At least once a month	16%	13%	8%				
Once per month or less	14%	14%	17%	At least once a year	7%	5%	5%				
Use Facebook (at least occasionally)	**74%**	**70%**	**56%**	Access a social network site (e.g., Facebook, Twitter, Instagram)	**67%**	**46%**	**34%**	Visit social network sites	**63%**	**55%**	**47%**
				Daily	41%	23%	14%				
				Several times a week	17%	14%	10%				
				At least once a month	7%	7%	8%				
				At least once a year	3%	3%	2%				
				Use other social media (e.g., LinkedIn) to network with people	**21%**	**11%**	**7%**				
				Daily	3%	1%	1%				
				Several times a week	4%	2%	1%				
				At least once a month	7%	4%	3%				
				At least once a year	8%	4%	2%				
				Take or share photos and videos	**80%**	**60%**	**45%**				
				Daily	6%	3%	2%				
				Several times a week	25%	15%	9%				
				At least once a month	34%	28%	20%				
				At least once a year	14%	13%	14%				

Table 3. (Cont.) ICT activities.

Qualtrics 2017	65–74 years	75–84 years	85+ years	HRS 2020	65–74 years	75–84 years	85+ years	NHATS 2021	65–74 years	75–84 years	85+ years
Leisure or Hobby											
Look around or surf the web	**91%**	**88%**	**87%**	Visit websites or surf the Internet	**82%**	**63%**	**43%**				
Several times a week or more	55%	46%	35%	Daily	46%	27%	17%				
About once a week	11%	13%	15%	Several times a week	24%	24%	12%				
Several times per month	12%	11%	15%	At least once a month	9%	9%	9%				
Once per month or less	13%	18%	22%	At least once a year	2%	4%	6%				
Play games	**58%**	**55%**	**47%**	Play games or do puzzles	**67%**	**59%**	**53%**				
Several times a week or more	37%	38%	32%	Daily	31%	27%	24%				
About once a week	6%	5%	5%	Several times a week	16%	13%	15%				
Several times per month	5%	5%	4%	At least once a month	11%	11%	7%				
Once per month or less	11%	8%	6%	At least once a year	9%	7%	7%				
Use streaming services (e.g., Netflix, Hulu, Amazon Prime Video, YouTube)	**49%**	**31%**	**30%**	Watch videos on sites like YouTube or Netflix	**78%**	**53%**	**34%**				
Several times a week or more	17%	9%	9%	Daily	23%	15%	7%				
About once a week	10%	6%	4%	Several times a week	30%	16%	12%				
Several times per month	8%	6%	4%	At least once a month	18%	16%	9%				
Once per month or less	14%	10%	13%	At least once a year	6%	5%	6%				
Listen to music using an app (e.g., Spotify, Pandora)	**36%**	**21%**	**21%**	Listen to music, radio, or podcasts	**83%**	**69%**	**58%**				
Several times a week or more	10%	4%	6%	Daily	38%	28%	26%				
About once a week	5%	2%	1%	Several times a week	29%	23%	19%				
Several times per month	6%	5%	2%	At least once a month	12%	13%	10%				
Once per month or less	14%	9%	11%	At least once a year	5%	5%	3%				
Listen to podcasts or radio	26%	17%	22%								
Several times a week or more	4%	3%	4%								
About once a week	5%	2%	3%								
Several times per month	4%	4%	3%								
Once per month or less	13%	8%	12%								

Table 3. (Cont.) ICT activities.

Qualtrics 2017	65–74 years	75–84 years	85+ years	HRS 2020	65–74 years	75–84 years	85+ years	NHATS 2021	65–74 years	75–84 years	85+ years
Leisure or Hobby											
Family history and genealogy	**26%**	**27%**	**34%**	Read books	**66%**	**62%**	**54%**				
Several times a week or more	3%	3%	5%	Daily	22%	24%	25%				
About once a week	2%	2%	2%	Several times a week	15%	15%	16%				
Several times per month	4%	2%	1%	At least once a month	17%	14%	8%				
Once per month or less	18%	20%	25%	At least once a year	12%	8%	5%				
Visit websites created by family or friends	**54%**	**54%**	**64%**								
Several times a week or more	22%	21%	20%								
About once a week	10%	13%	10%								
Several times per month	8%	7%	11%								
Once per month or less	16%	15%	22%								
Day-to-Day Information											
News, sports, or weather	**56%**	**59%**	**53%**	News and other information updates	**84%**	**73%**	**73%**				
Several times a week or more	18%	22%	14%	Daily	49%	39%	39%				
About once a week	9%	9%	9%	Several times a week	24%	21%	21%				
Several times per month	6%	7%	6%	At least once a month	9%	10%	10%				
Once per month or less	22%	21%	24%	At least once a year	3%	3%	3%				
				Check the weather	**91%**	**81%**	**75%**				
				Daily	58%	52%	48%				
				Several times a week	24%	21%	15%				
				At least once a month	8%	7%	7%				
				At least once a year	2%	1%	5%				

Table 3. (Cont.) ICT activities.

Qualtrics 2017	65–74 years	75–84 years	85+ years	HRS 2020	65–74 years	75–84 years	85+ years	NHATS 2021	65–74 years	75–84 years	85+ years
Day-to-Day Information											
				Get information about local neighborhood events	**76%**	**66%**	**58%**				
				Daily	21%	18%	19%				
				Several times a week	22%	22%	16%				
				At least once a month	24%	18%	15%				
				At least once a year	8%	7%	8%				
				Get directions or traffic information	**81%**	**63%**	**46%**				
				Daily	9%	6%	2%				
				Several times a week	24%	15%	10%				
				At least once a month	35%	28%	17%				
				At least once a year	13%	15%	17%				
Make travel arrangements	**49%**	**42%**	**62%**	Manage travel or hotel	**47%**	**30%**	**14%**				
Several times a week or more	2%	1%	2%	Daily	0%	0%	0%				
About once a week	2%	1%	1%	Several times a week	1%	0%	0%				
Several times per month	4%	4%	7%	At least once a month	6%	3%	1%				
Once per month or less	41%	36%	53%	At least once a year	41%	26%	13%				
Search for information (e.g., hobbies, movies, recipes)	**77%**	**73%**	**73%**	Search for ideas (e.g., recipes, patterns)	**83%**	**70%**	**54%**				
Several times a week or more	15%	12%	9%	Daily	18%	10%	6%				
About once a week	14%	14%	10%	Several times a week	29%	22%	14%				
Several times per month	16%	13%	18%	At least once a month	25%	24%	18%				
Once per month or less	32%	34%	37%	At least once a year	11%	14%	16%				

Table 3. (Cont.) ICT activities.

Qualtrics 2017	65–74 years	75–84 years	85+ years	HRS 2020	65–74 years	75–84 years	85+ years	NHATS 2021	65–74 years	75–84 years	85+ years
Day-to-Day Information											
				Use as an alarm clock, timer, or calendar	**81%**	**71%**	**61%**				
				Daily	42%	34%	33%				
				Several times a week	23%	19%	16%				
				At least once a month	12%	13%	9%				
				At least once a year	5%	4%	4%				
				Use a home assistant (e.g., Amazon Echo, Google Home)	**36%**	**30%**	**23%**				
				Daily	10%	10%	6%				
				Several times a week	9%	8%	6%				
				At least once a month	3%	3%	4%				
				At least once a year	64%	70%	77%				
				Write notes, take surveys, or fill out forms	**74%**	**64%**	**56%**				
				Daily	14%	11%	11%				
				Several times a week	17%	16%	14%				
				At least once a month	27%	24%	19%				
				At least once a year	17%	14%	12%				
				Apply for jobs online	**5%**	**1%**	**1%**				
				Daily	0%	0%	0%				
				Several times a week	1%	0%	0%				
				At least once a month	1%	0%	0%				
				At least once a year	2%	1%	0%				
				Track your steps, exercise, or personal fitness	**43%**	**30%**	**31%**				
				Daily	15%	8%	10%				
				Several times a week	13%	10%	11%				
				At least once a month	10%	7%	7%				
				At least once a year	6%	5%	3%				

Note: Activities bolded are the percent that do the activity.

Table 4. Benefits of Internet use.

Qualtrics 2017	65–74 years (Young-old)	75–84 years (Old-old)	85+ years (Oldest-old)
Makes it easier to get the information I need	96%	97%	96%
Contributes to my ability to stay in touch with people I know	84%	86%	92%
Makes it easier for me to reach people	82%	83%	88%
Makes it easier to get the health information I need	81%	80%	80%
Helps me feel more connected to friends and family	79%	82%	91%
Increases the quantity of my communication with others	75%	76%	82%
Makes me feel less isolated	71%	78%	76%
Helps me to manage my finances	69%	64%	71%
Makes it easier to meet new people	51%	52%	32%
Improves my health	46%	42%	42%

Note: Table 4 reports responses from participants who agreed or strongly agreed.

85 years and older: 10%). Though older adults are using ICTs at higher levels than in prior times, their use is likely to remain different than that of younger age groups due to their life stage, as would be predicted by SST (Carstensen, 1993, 1998, 2006). We suggest that these differences are to be expected and do not mean that older adults are not digitally included. Older adults possess and use ICTs for numerous purposes; however, there are online activities in which the majority of older adults are not engaging, such as ordering food, applying for jobs, or maintaining personal fitness. Importantly, older adults reported that their Internet access and use are beneficial in their daily lives. Internet use has contributed to their ability to find information, stay connected with family and friends, feel less isolated, and accomplish things that are important to them. This is consistent with the social integrative and affective integrative needs which are addressed through ICT use based on the UGT (Aarts, 2018; Baecker et al., 2014; Jung et al., 2017; Katz et al., 1973; Sheldon et al., 2021; Sinclair & Grieve, 2017).

While the types of ICTs owned and used and the main purposes of their use were similar across the age cohorts, there was variation in the rates of ownership and use across cohorts. Young-old had higher device ownership for a wide range of devices. As individuals age, their desire and reasons for using ICTs may likely diminish. For older adults to be digitally included, they need to have access to ICTs, affordable Internet access, devices that meet their needs and that they can use effectively, access to digital literacy training, support when technology fails, and support when they have problems using their devices.

7. Limitations

In this study, we examined various aspects of digital inclusion—ownership, use, and related aspects of ICTs—across three national US datasets. Data collection ranged from 2017 to 2021, with one study utilizing data collected via an online sample of Internet users and the other studies collecting data via telephone and/or in-person

surveys. Rates of ownership and use varied across the three datasets, suggesting that the type of sample and the mode of data collection matter in relation to ICT measures. The Qualtrics online sample reported higher rates/scores on most indicators, compared to the other samples. Given that they were all Internet users in the Qualtrics sample, it is not surprising that they reported higher rates/scores. Unfortunately, the three datasets varied considerably in how they assessed ICT use and access; while we attempted to compare "apples to apples," the variability in measures makes this challenging. Unfortunately, national datasets that include nuanced measures of ICT use and purpose are rare (Cotten, 2021). Future studies should include measures that can better assess the type, amount, use, timing, and changes in the use of ICTs over time for older adults (Cotten et al., 2011). In addition, questions asked should include one ICT device or use, rather than multiple items combined into one question. For example, NHATS does not differentiate between a cellphone and a smartphone; however, as we see with the HRS and Qualtrics data, there are differences between smartphone and cellphone ownership and use across the age cohorts. While this study was descriptive in nature, it has provided insights into how access and usage vary across older age groups. Future studies are needed that examine factors that are associated with digital inclusion and use levels across various age groups of older adults.

8. Conclusions

Though reports of being constantly connected online may be increasing for younger age groups, few older adults report being constantly connected and may not desire this constant connection. As SST suggests, as individuals age their preferences for connection and how they spend their time often change. We suggest that many older adults are still digitally included even though their usage rates and levels may be lower than those of younger age groups. Digital inclusion is a social construct that has different, nuanced, meanings for different

groups. It behooves us to continue to examine how older adults are digitally included and how this may be changing over time.

Conflict of Interests

The authors declare no conflict of interests.

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