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Fostering Resilience: Understanding Generational Differences in Information and Communication Technology (ICT) and Social Media Use

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Abstract

By analyzing survey data collected from 2,002 participants in 5 generational cohorts in the United States, this study examines generational differences in information and communication technology (ICT) and social media use behaviors. The intersection between digital divide theory and generational cohort theory provides the theoretical foundation for this study. There are two major findings. First, there are significant differences in ICT use among 5 different generations (Generation Z, Generation Y, Generation X, Boomers, Silent Generation). In terms of ICT access and use, the silent generation is left behind other generations. Thus, the grey divide still exists. Second, different generations have different preferences for social media platforms. For example, more Generation Z participants use Snapchat, Twitter, and Instagram. This study brings additional insights into generational differences/divide in ICT and social media use. Practical suggestions are provided to narrow the generational divide and to foster communicative resilience among different generations amid the COVID-19 pandemic.

Keywords: resilience; COVID-19; ICT; social media; digital divide; grey divide; generational cohorts

Introduction

We now live in a digital era. Thus, information and communication technology (ICT), such as computers, Internet, mobile devices, smart phones, and social media are widely adopted and used by individuals and organizations. Nevertheless, different demographic factors, such as age/generation, gender, income, and educational level, still affect individuals' adoption and use of ICT, including social media. Among different demographic variables, generation has attracted some scholarly attention (e.g., Bailey & Ngwenyama, 2010; Cherrez-Ojeda et al., 2020; Metallo & Agrifoglio, 2015; Padayachee, 2018; Prensky, 2001; van Volkmar et al., 2013) in different disciplines, such as communication, information, generational studies, and marketing. Based on the intergenerational communication perspective, technology use can either benefit or create barriers for intergenerational interactions (Bailey & Ngwenyama, 2010). From the market segmentation perspective, generation has long been regarded as a segmentation approach due to its utility in predicting consumer behaviors (Kotler & Armstrong, 2010). Generational cohorts define consumer segments by using coming-of-age year as a proxy determinant (Rogler, 2002). In other words, researchers categorize consumers into different generational cohorts based on their age. Understanding how consumers in different generational cohorts perceive and use ICT can help organizations develop effective market segmentation strategies and communicate with the target groups.

Many organizations in different industries have been impacted by the COVID-19 pandemic. As Close et al. (2020) noted, "companies' resilience is being tested as never before. Consumer spending in the US fell by almost 20% during the first two months of COVID-19's explosive spread across the country, according to the US Department of Commerce" (para. 2). To survive in the current economic environment and cultivate business resilience, organizations have to understand different group of customers' communication preferences in order to engage with them and maintain long-term customer relations. Organizations can improve digital presence and offer products and services via multiple channels to cultivate business resilience during the COVID-19 pandemic. Both personal and organizational resilience can be cultivated (e.g., Buzzanell, 2010; 2018).

What is resilience? Resilience is defined as "a dynamic process of positive adaption in the face of adversity. When individuals face major stressors due to events such as natural disasters, trauma, public health crises, and now coronavirus 2019 (COVID-19), resilience is tested on an individual, organizational, and societal

level" (Richards & Dixon, 2020, p. 878). From the fostering resilience perspective, it is imperative to identify major generational differences/divide in ICT use in order to facilitate effective intergenerational communication and foster communicative resilience in different contexts, such as marketplace, family, and workplace. Indeed, the unexpected COVID-19 pandemic created unique challenges for intergenerational communication and social connectedness due to health concerns and social distancing orders. Specifically, elderly adults are a high-risk population for COVID-19 infection. Thus, the Centers for Disease Control and Prevention (CDC) recommends that older adults limit physical interactions with other people as much as possible. According to CDC's guideline, attending virtual events is considered low risk, whereas in-person gatherings are high risk (CDC, 2020). Communicating virtually by using modern technologies is the safest way for the elderly to communicate and socialize with others in the COVID-19 era. Nevertheless, previous studies (e.g., Friemel, 2016; Hao, 2019) suggested that older generations are left behind in terms of accessing and using information and communication technologies (ICT). This phenomenon is called the grey divide, a form of digital divide that suggests that "age-related factors – beyond income, education, and gender – affect older adults, hinder their ability to take advantage of digital media" (Quan-Hasse et al., 2018, p.). In the given situation, intergenerational communication channels and people's emotional wellbeing can be severely impacted by the pandemic. Now, the question is: how can we foster communicative resilience among generations and navigate through the current global health crisis? Previous studies (e.g., Buzzanell, 2010; 2018; Dutta, 2019) suggested that communication plays an essential role in fostering resilience. Good communication is essential to emotional resilience because it fosters positive emotions (Mental Help, 2020). To respond to the unique challenges caused by the COVID-19 pandemic, this study aims to investigate generational differences in ICT use to better understand generational divides/gaps and foster communicative resilience among generations.

Previous studies (e.g., Bailey & Ngwenyama, 2010; Leung, 2013; Metallo & Agrifoglio, 2015; Prensky, 2001) suggested that generation can affect people's adoption and use of ICT, including social media. Previous research findings (e.g., Cohan & Richards, 2015; Ziz & Kiasi, 2016) also suggested that individuals and organizational members can connect with each other, support each other, and cultivate resilience through social media to deal with adversity. Thus, it is noteworthy to dive deeper into how different generations use social media. When the Pew Research Center began tracking social media adoption in 2005, only about 5% of American adults used at least one of the social media platforms. Recently, Pew Research

Center's (2019) research results suggested that about 72% of American adults use some type of social media. Thus, this study aims to analyze generational differences in ICT use, in general, and social media use, in particular. The next sections of this paper review literature about generational differences in ICT and social media use, and the two theories guiding this study: digital divide theory and generational cohort theory.

Literature Review

Generational Differences in ICT and Social Media Use

Information and communication technology (ICT) refers to communication technologies/devices that facilitate the collection, management, control, and distribution of information. Traditionally, "ICTs include computers, telephones, the Internet, radio, televisions, and digital image and music technologies" (Wilson et al., 2013, p. 4). However, due to the rapid growth of social media use at both personal and organizational levels in the last 15 years, recent technology studies (e.g., Metallo & Agrifoglio, 2015; van Volkcom et al., 2013) also include social media as a new form of ICT.

As discussed earlier, generational differences in ICT use have attracted scholarly attention. For example, Prensky (2001) identified two types of technology users based on age/generation and technological experiences. He proposed two generational labels: digital natives (DN) and digital immigrants (DI). DN are people who were born after 1980 and who have grown up in a digital world. DN have lived their lives "surrounded by and using computers, video games, digital music players, video cams, cell phones, and all other toys and tools of the digital age" (Prensky, 2001, p. 1). Because DN have grown up with the access to networked digital technologies, they learn and use them in fluent and sophisticated ways. DI, conversely, were born not to the digital world (i.e., prior to 1980). DI are technology users who started using information systems at some stage in their adult lives, and thus lack the technological fluency that many DN have. As Metallo and Agrifoglio (2015) noted, "DN are differentiated from DI by their use of technology, with disparity between their technological skills and interests, as well as between their needs and concerns" (p. 871).

Overall, DN are more technologically savvy than DI. DN are more likely to prefer online communication and interactions than DI. Using Prensky's (2001) generational categories, Metallo and Agrifoglio (2015) conducted a study to compare DN's and DI's perceptions of Twitter. They surveyed 385 Twitter users in UK in 2009 to examine how DN and DI perceive technology, and whether these differences are relevant for their use-continuance behaviors with respect to Twitter. They found that "DN experience more social pressure to use

Twitter and find it is easier to use – but less useful – than do DI” (p. 876). The finding that DN consider Twitter to be less useful than do DI could be explained by the differences in the two generations’ purposes for using this platform. DI mainly use Twitter for job-related reasons, while DN do so primarily for leisure. The result of their study also suggested that “the users’ continuance behaviors are explained by the differences in their perceptions of Twitter rather than generational differences” (Metallo & Agrifoglio, 2015, p. 877).

Fietkiewicz et al. (2016) compared how different generations (Generation X vs. Generation Y vs. Generation Z) use different social media platforms. They surveyed 373 participants in Germany (60%), Poland (22%), Switzerland (4%), U.S. (4%), Russia (1.3%), Australia (1%), U.K. (1%) and other countries (7.9%) in 2015. The results suggested that these three generations have different preferences for social media platforms. For example, Generation X is more likely to use Twitter than younger generations, because of the practical purposes of this short message service. Generation Y prefers to use Facebook (FB), because FB appeared in the mid-2000s and became the first mainstream social media for digital natives. Generation Z is more likely to use Instagram, an online photo- and video-sharing platform, than older generations.

Previous research findings (e.g., Autry & Berge, 2011; Fietkiewicz et al., 2016; Metallo & Agrifoglio, 2015; Prensky, 2001) suggested that there are generational differences in ICT and social media use. Now, a subsequent question is: What theories may explain generational differences in ICT use?

Digital Divide Theory

Digital divide theory serves as one of the theoretical foundations for this study, because previous studies (e.g., Friemel, 2016; van Volkmar et al., 2013) suggested that there is a digital divide/gap in technology and social media usage among different generations. Specifically, there is a grey divide, which indicates that older generations are left behind in terms of getting access to and using technologies (Friemel, 2016; Hao, 2019). What is the digital divide? As Rice and Pearce (2015) noted, “digital divide or digital inequality originally described the socioeconomic gap between those with and without access to computers in the US” (p. 402). The definition of digital divide has been extended from access divide (first-level divide) to subsequent divides: usage, activities, skills, and knowledge (Buchi et al., 2016; Pearce & Rice, 2013; Rice & Pearce, 2015). Over the last two decades, several studies have been conducted (Buchi et al., 2016; Pearce & Rice, 2013; Pearce & Rice, 2014; Rice & Pearce, 2015; van Deursen & van Dijk, 2014; van Dijk, 2005; Wu, 2020a) to explore inequalities in access to (first-level) and

use of (second-level) digital and communication technologies, such as computer, Internet, mobile devices, and social media. Rice and Pearce (2015) argued that “the digital divide is now a central focus of information and communication technology (ICT) studies. The digital divide concept has been expanded to include any gap between groups (including nations) across divides of awareness, adoption, knowledge, skill, social capital, devices, language and literacy, use, activities, and outcomes of ICTs” (p. 402).

More recently, the third-level of digital divide was identified by researchers (Hao, 2019; Scheerder et al., 2017; van Deursen & Helsper, 2015). Hao (2019) argued that there are three levels of digital divide. In addition to first-level (access divide) and second-level (usage divide), there is a third-level divide (outcome divide). After people get access to ICT, even if they possess the same level of skills and engage in broadly similar online activities, they do not necessarily obtain the same level of benefits. Disparities in returns and outcomes constitute the outcome divide (third-level divide). Scheerder et al. (2017) argued that third-level digital divide has great social impacts, but it is underexposed and thus needs scholarly attention.

While some scholars (Scheerder et al., 2017) proposed a shift of attention from first-level digital divide to other levels, other scholars (Friemel, 2016) argued that the gap in physical access still exists, both between and within countries. For example, there is a grey divide (Friemel, 2016; Hao, 2019; Taylor & Earl, 2016). Research findings suggest that 75% of seniors aged 65 or older in Switzerland are not online. Cost is not a concern. However, older people are not using the Internet because they do not think it is necessary or simply do not possess the necessary mental or physical abilities (Friemel, 2016).

In summary, previous studies suggest that there is a generational divide in ICT access and usage. Specifically, there is a grey divide (Friemel, 2016; Hao, 2019) between older and younger generations.

Generational Cohort Theory

If there is a digital divide in technology use among different generations, it will be imperative to further examine the differences in ICT and social media use based on generational cohort theory. Generational cohort theory is based on the premise that individuals in each age group will be limited to a specific range of potential experience that predisposition them to a “characteristic mode of thought and experience” and “historically relevant action” (Sesse et al., 2007, p. 49). Padayachee (2018) noted that the basic assumption of generational cohort theory is that “an individual’s philosophy is shaped by the period in they are born, hence the ideas, sentiments,

and values of members of the same cohort converge and evidently their actions as well" (p. 58). Consequently, each generational cohort is more or less unique in several ways because it is shaped by unique conditions that presided from their year of birth onward (Inglehart, 1997).

There are different ways to define generational cohorts (Dimock, 2019; Strass & Howe, 1991). Pew Research Center's definition and categorization of generation is widely used by researchers and marketers. As Dimock (2019) noted, Pew Research Center is committed to researching differences in public attitudes on key issues across demographic groups, including generation. Specifically, "generational cohorts give researchers a tool to analyze changes in views over time" (Dimock, 2019, para. 3). The research center clearly defined five generations in the U.S. based on people's year of birth: (1) Generation Z/Post Millennials (born 1997-2012, ages 7-22 in 2019), (2) Generation Y/Millennials (born 1981-1996, ages 23-38 in 2019), (3) Generation X (born 1965-1980, ages 39-54 in 2019), (4) Boomers (born 1946-1964, ages 55-73 in 2019), and (5) Silent (born 1928-1945, ages 74-91 in 2019).

Generational cohort theory has been used by researchers to examine generational differences in technology and social media usage behaviors in different countries, such as the United States (Vogels, 2019), Malaysia (Ting et al., 2016), and South Africa (Padayachee, 2018). However, some generations, such as Generation Z and Silent Generation, are understudied in technology research. As Dimock (2019) noted, the millennial generation, Generation Y, has been well studied by Pew Research Center for more than a decade. However, very few studies have been conducted to examine Generation Z, because it is new. In addition, several previous ICT and social media studies only studied one generation (Friemel, 2016) or compared user behaviors across two or three generations (Fietkiewicz et al., 2016; Metallo & Agrifoglio, 2015; Vogels, 2019). Vogels (2019) compared Millennials/Generation Y, Generation X, and Boomers' technology use in the U.S. and found that Millennials led older Americans in their adoption and use of technology. Nevertheless, she did not include Generation Z and Silent Generation in her study. To broaden the research scope and bridge the gap, this comparative study will include all of the five generations for analysis.

Based on the literature review, two research questions guided this study.

RQ1: What are the generational divides/differences in ICT use behaviors?

RQ2: What are the generational divides/differences in social media use behaviors?

Because of the rapid growth of social media use during the last two decades, it would be meaningful to take a closer look at generational differences in ever using social media and specific platforms. Thus, two sub-questions are necessary.

RQ2A: What are the generational differences in ever using social media sites?

RQ2B: What are the generational differences in using specific social media platforms?

Methods

Samples and Procedures

The results of this study are based on Pew Research Center's Core Trend Survey data (Pew Research Center, 2018). A telephone interview survey was conducted in the United States from January 3 to January 8, 2018. The sample was obtained from 2,002 adults, 18 years of age or older, living in all 50 states and the District of Columbia. Five hundred respondents were interviewed on a landline telephone, and 1,502 were interviewed on a cell phone (Smith & Anderson, 2018).

Participants' ages ranged from 18 to 97 with mean of 51.8 years. Following Dimock's (2019) definition of generation, participants were recoded into five different generational cohorts based on their ages in 2018. Of the participants, 124 (6.2%) were post millennials/Generation Zers (ages 18-21), 447 (22.3%) were millennials/Generation Yers (ages 22-37), 448 (22.4%) were Generation Xers (ages 38-53), 695 (34.7%) were Boomers (ages 54-72), and 239 (11.9%) were Silent Generation (ages 73-97). 1,081 (54%) were male and 921 (46%) were female.

Respondents reported diverse educational levels and employment status: 108 (8.4 %) did not have high school degree, 456 (22.8 %) were high school graduates, 315 (15.7%) had some college with no degree, 213 (10.6%) had two-year associate degree from college or university, 483 (24.1%) had four-year college or university degree, 188 (9.4%) had postgraduate training with no degree, and 147 (7.3%) had postgraduate or professional degree. 858 (42.9%) of respondents were employed full time, 238 (11.9%) were employed part-time, 16 (.8%) were students, 500 (25.0%) were retired, 65 (3.2%) were self-employed, 55 (2.7%) were disabled, and 233 (11.6%) were not employed for pay.

The Pew Research Center's survey included questions measuring respondents' ICT and social media usage behaviors as well as demographic data. To measure participants' ICT access (e.g., using Internet or email, Internet access via mobile device, having a smart phone, having a computer, having a laptop, having a game console), multiple choice questions were used. For example, participants were asked: Do you use the internet or email, at least occasionally? The choices included: (1) yes, (2) no, (3) don't know, and (4) refused. If participants were Internet users, follow-up questions were asked. An example of follow-up question is about usage frequency: About how often do you use the internet? The choices were: (1) almost constantly, (2) several times a day, (3) about once a day, (4) several times a week, (5) less often, (6) don't know, and (7) refused.

Similarly, multiple choice questions were used to measure participants' social media use behaviors. For example, participants were asked: Do you ever use social media sites like Facebook, Twitter or Instagram? The choices were: (1) yes, (2) no, (3) don't know, and (4) refused. If participants were social media users, a follow-up question was asked: Please tell me if you ever use any of the following social media sites online or on your cell phone. Do you ever use ... The list of social media platform was: Twitter, Instagram, Facebook, Snapchat, YouTube, WhatsApp, Pinterest, and LinkedIn. The choices were: (1) yes, (2) no, (3) don't know, and (4) refused.

Data Analysis

To answer RQ1, cross-tab (Chi-Square) analyses were conducted to examine the relationships between generation (i.e., Generation Z, Generation Y, Generation X, Boomers, Silent Generation) and ICT use behaviors (i.e., using Internet, having a tablet computer, having a smartphone, and ever using social media sites). To answer RQ2, cross-tab (Chi-Square) analyses were conducted to examine the relationships between generation and social media use behaviors (i.e., using Twitter, Instagram, Facebook, Snapchat, YouTube, WhatsApp, and LinkedIn). SPSS for windows was used for statistical analysis and the significance level of .05 was set.

Results

RQ1: Generational Divide/Differences in ICT Use

There are significant generational differences in ICT ownership and usage behaviors (see Table 1).

Overall, younger generations are more likely to own a variety of ICTs and use Internet more frequently than older generations. There are a number of important findings. First, the percentages for Baby Boomers and Silent Generation using the Internet are lower than for

Generation Z, Y, and X. The vast majority (more than 90%) of participants in Generation Z (98.4%, Generation Y (95.7%), and Generation X (92.4%) use Internet or email. About 4 out of 5 Boomers (84.5%) and half of Silent Generation (56.5%) use Internet or email. This result is consistent with Vogels' (2019) research, which suggested that "Baby Boomers continue to trail both Gen Xers and Millennials on most measures of technology adoption" (para. 5). In this study, the most obvious generational divide/gap is between the Silent Generation and the other generations. That is, there is still a noticeable grey divide.

Table 1. Differences in ICT Use Among Different Generations

Survey Items:	Generation Z		Generation Y		Generation X		Baby Boomers		Silent Generation		Chi-Square
	Freq	Percent	Freq	Percent	Freq	Percent	Freq	Percent	Freq	Percent	
Use Internet or Email	122	98.4%	428	95.7%	414	92.4%	587	84.6%	135	56.5%	245.75***
Internet Access via Mobile Device	121	97.6%	430	96.4%	419	93.5%	537	77.4%	102	43.0%	386.26***
Subscribe to Internet at Home	93	77.5%	329	75.6%	358	83.3%	529	87.9%	119	82.6%	28.50***
Have a Smart Phone	117	95.1%	414	93.0%	386	88.5%	505	77.0%	87	43.7%	262.28***
Have a Tablet Computer	65	52.4%	240	53.7%	297	66.4%	379	54.8%	75	31.9%	74.32***
Have a Desktop or Laptop Computer	107	86.3%	342	76.5%	349	77.9%	539	77.6%	138	58.0%	50.60***
Have a Game Console	78	62.9%	250	55.9%	206	46.2%	129	18.6%	9	3.8%	338.39***
Internet Use Frequency:											28.50***
Almost Constantly	56	45.5%	172	39.4%	134	31.1%	112	18.5%	15	10.3%	
Several Times a Day	53	43.1%	216	49.5%	215	49.9%	320	52.9%	54	37.2%	
Once a Day	5	4.1%	17	3.9%	34	7.9%	73	12.1%	31	21.4%	
Several Times a Week	0	0.0%	24	5.5%	27	6.3%	47	7.8%	21	14.5%	
Less Often	8	6.5%	7	1.6%	20	4.6%	52	8.6%	23	15.9%	

N = 2,002, ***p<.001, **p<.01, *p<.05.

Second, older generations (Boomers and Silent Generation) are less likely to own a smart phone. The vast majority of Generation Z

(95.1%), Generation Y (93.0%) and Generation X (88.5%) participants own a smart phone, but about 3 out 4 of Boomers (77.0%) and less than half of Silent Generation (43%) own a smart phone. This result may imply that older generations may only use the basic functions of cell phones, such as calling. However, younger generations use many different functions of smart phones, such as web searching, texting, accessing social media sites, and gaming. This finding is consistent with previous research (e.g., Prensky, 2001; van Volkcom et al., 2013) that suggested it is easier for younger generations to learn new technologies and use technologies in more sophisticated ways.

Third, the percentage of older generations accessing Internet or email via mobile devices is lower than younger generations. The vast majority of Generation Z (97.6%), Generation Y (96.4%), and Generation X (93.5%) participants access Internet and email via mobile devices. However, about 3 out of 4 of Boomers (77.4%) and less than half of Silent Generation (43%) access Internet via mobile devices. This result is consistent with the result related to smart phone ownership. When participants own a smart phone, it is convenient for them to get access to the Internet by using the smart phone.

This result can explain why the pattern for generational differences in subscribing to Internet at home is different from other patterns. The younger generations are very mobile. As noted above, younger generations, such as Generation Z (97.5%) and Generation Y (96.4%), mainly use smart phones to access the Internet. With Internet access via mobile devices, younger generations may not need to subscribe to Internet from home. That is why the percentage for Generation Z (77.5%) and Generation Y (75.6%) subscribing to Internet at home is lower than that of Generation X (83.3%), Baby Boomers (87.9%), and Silent Generation (82.6%).

Fifth, the younger generations, especially DN (Generation Z and Generation Y) are more likely to have a game console. More than half of the participants in Generation Z (62.9%) and Generation Y (55.9%) have a game console. Less than half of Generation X (46.2%) have one, while only a small number of Boomers (18.6%) and Silent Generation (3.8%) have a game console. This research finding is consistent with van Volkcom et al. (2013) that suggested that younger generations are more likely to view technology as a tool for entertainment.

Finally, younger generations use the Internet more frequently than older generations. More than 4 out of 5 participants in Generation Z (88.6%), Generation Y (88.9%), and Generation X (81.0%) use the Internet either almost constantly or several times a day. Meanwhile,

about 3 out of 4 Boomers (71.4%) and less than half of Internet users in Silent Generation (47.5%) do so. The Silent Generation is much less connected than other generations.

The results of this study are somewhat consistent with previous research findings (e.g., Metallo & Agrifoglio, 2015; Prensky, 2001; van Volk et al., 2013), which suggested that younger generations are more tech-savvy than older generations. For example, the percentage of younger generations owning a variety of ICTs is higher than older generations. However, it is a little bit surprising that Generation X participants' ICT ownership and access seem to be more similar to DN (Generation Y and Generation Z) in some areas, such as using Internet or email, accessing Internet or email via mobile devices, and having a smart phone. Prensky (2001) suggested that people who were born after 1980 are considered as DN, including Generation Y and Generation Z. People who were born before 1980 are DI, including Generation X and Boomers. Theoretically, Generation X's ICT ownership and usage behaviors should be more similar to Boomers and different from Generation Y and Generation Z participants.

Why are the results of this study different from Prensky's (2001) generational categories? The differences may be explained by the fact that technological trends are constantly changing. Prensky's DN vs. DI generational label was proposed about two decades ago. During the past two decades, many ICTs, such as computers, cell phones, Internet, and social media, became ubiquitous in the digital era. When some technologies become ubiquitous, user demographics can change. Another possible explanation is related to participants' work status. When the data of this study was collected, Generation X (ages 38 - 53) participants were still in the workforce. However, some Boomers (ages 54 - 72) and a majority of Silent Generation (ages 73 and above) were retired. As Metallo and Agrifoglio (2015) stated, many organizations encourage workers to adopt and use ubiquitous technologies to improve interaction and data exchange without the limits of time and space. Thus, organizational workers' and retirees' ICT ownership and usage behaviors will be different. This could be a reason why Generation X participants' ICT ownership and usage behaviors are more similar to those of DN.

RQ2: Generational Divide/Differences in Social Media Use

There are also generational differences in social media use behaviors (see Table 2).

Overall, younger generations (DN), Generation Z and Generation Y, are the most active users of social media. More than 80% of Generation Z (88.7%) and Generation Y (84.8%) have ever used

social media. Still, the majority of Generation X (75.4%) and Baby Boomers (60.7%) are social media users. Compared to all other generations, the Silent Generation is left behind as less than one-third (28%) are social media users. Thus, there is still a generational divide/grey divide in social media use, most obviously between the Silent Generation and the other generations. This finding is consistent with findings regarding generational divide in overall ICT access and ownership (see Table 1) and previous studies (e.g., Petrie & Darzentals, 2020; Quan-Haase et al., 2018). People use various types of ICTs, such as computer, tablet, and smart phone to access social media. If the percentage of Silent Generation who own these devices is much lower than other generations, they are less likely to use social media. Even older adults who own a computer and other digital devices may still encounter difficulties using social networking sites (SNSs) because they perceive the complexity of the applications to be a barrier (Petrie & Darzentals, 2020). As Petrie and Darzentals (2020) noted, staying in touch with grandchildren is a major motivation for older adults to learn to use digital technologies, including SNSs. Although the motivation could be strong in this regard, they may find it difficult to use because of low computer skills. Thinking about fostering communicative resilience amid the pandemic, the grey divide in social media use may affect older adult's psychological well-being, because this gap may prevent older adults from keeping posted about how family members are doing while not being able to meet with them in person due to health concerns.

Table 2. Generational Differences in Social Media Use Behaviors

	Generation Z		Generation Y		Generation X		Baby Boomers		Silent Generation		Chi-Square
Survey Items:											
Ever Use:	Freq	Percent	Freq	Percent	Freq	Percent	Freq	Percent	Freq	Percent	
Social Media Sites	110	88.7%	379	84.8%	338	75.4%	420	60.7%	67	28.0%	283.00***
Twitter	57	46.0%	136	30.6%	132	29.7%	107	15.8%	20	9.3%	102.19***
Instagram	86	69.4%	230	51.7%	152	34.2%	130	19.2%	16	7.5%	268.74***
Facebook	91	73.4%	363	81.6%	340	76.4%	437	64.5%	77	36.5%	155.24***
Snapchat	95	76.6%	202	45.5%	75	16.9%	59	8.7%	9	4.2%	456.08***
YouTube	117	94.4%	400	89.9%	373	83.8%	467	68.9%	86	30.8%	328.86***
WhatsApp	32	26.0%	162	36.4%	126	28.6%	91	13.5%	11	5.2%	128.24***
Pinterest	34	27.4%	142	32.1%	138	31.2%	182	27.0%	22	10.3%	39.31***
LinkedIn	22	17.9%	164	36.9%	164	37.2%	157	23.3%	16	7.6%	93.70***

N = 2,002, ***p<.001, **p<.01, *p<.05.

In terms of using specific social media platforms, there are a number of interesting findings. First, the majority of Generation Z are Snapchat, Twitter, and Instagram users. Compared to all other generations, more Generation Z participants use these three social

media platforms. However, the percentages for Generation Z using LinkedIn and Facebook are lower than for Generation X and Generation Y. This result is not surprising, because most of the Generation Z participants were still high school or college students (ages 18 - 21) when the survey was conducted. The fact that Generation Z uses Facebook less is consistent with previous research findings (e.g., Smart Hatch Technologies, 2018; PR Newswire, 2019), which suggested that the youngest generation often perceive Facebook to be outdated. In addition, Generation Z highly value privacy and anonymity. Thus, they would rather use newer social media platforms, such as Snapchat and Instagram (Smart Hatch Technologies, 2018).

Second, compared with other generations, more Generation Y are Facebook users. This result is not surprising and consistent with Fietkiewicz et al.'s (2016) research findings. As the authors noted, Facebook appeared in 2005 and became the mainstream social media platform for Generation Y. Third, more Generation X and Generation Y participants use LinkedIn than other generations. LinkedIn is the most popular professional social networking site. In terms of age range, Generation Y (ages 23-37) and Generation X (ages 38-53) were generally employed when the data was collected. This research finding is somewhat similar to Fietkiewicz et al.'s (2016) study, which suggested that Generation Z are less likely to use Xing, a professional network site, because most of them are still in school.

Fourth, the percentage for Generation X and Generation Y using Twitter, Pinterest, and LinkedIn are about the same, around one-third. This result is somewhat different from Fietkiewicz et al.'s (2016) study, which suggested that Generation X are more likely to use Twitter than Generation Y and Generation Z. Again, why are the research findings different between these two studies? The difference may be explained by where the samples were collected. The present study surveyed U.S. samples. However, Fietkiewicz et al. surveyed participants in multiple countries, including Germany, Poland, Switzerland, U.S., Russia, Australia, U.K., and other countries. Only 4% of the samples in their study were U.S. participants. Previous research findings (e.g., de Mooij, 2019; Wu, 2020a) suggested that there are cultural differences in social media use behaviors. As de Mooij (2019) noted, there are both global social network sites (SNSs), such as Facebook, and local SNSs. In most of the English-speaking countries, Facebook is very popular; however, in some countries, local SNSs generate more traffic, such as Weibo in China, Mixi in Japan, Cyword in South Korea, and VK in Russia. Differences in the most popular social media platforms across countries could be one of the reasons why Generation X participants'

most preferred social media platforms are different in this study and Fietkiewicz et al.'s study.

Finally, YouTube, the world's largest video sharing site, attracts the majority of social media users across four different generations. The vast majority of Generation Z (94.4%) and Generation Y (89.9%) participants use YouTube, compared to 83.8% of Generation X, 68.9% of Boomers, and 30.8% of Silent Generation. Specifically, DN (Generation Y and Generation Z) love to use YouTube as an educational and entertainment tool. As June and Lee (2015) noted, YouTube is increasingly used for teaching and learning. Still, the majority of DI (Generation X and Boomers) use YouTube. The only generation left behind is Silent Generation. This result is consistent with previous studies (e.g., PR Newswire, 2019; Wu, 2020b). PR Newswire's (2019) report suggested that YouTube attracts the majority of social media users across generations. Specifically, YouTube gains popularity with Generation Z as demands for video content arises. Wu's (2020b) research also suggested that YouTube is one of the most popular social media marketing tools used by organizations, because today's consumers are very visual. Nevertheless, a grey divide still exists, in terms of using YouTube; less than one-third (30.8%) of Silent Generation participants use YouTube. This finding can be explained by the fact that Silent Generation's access and use of ICTs in general is less than that of other generations. In order to watch YouTube videos, users need to use a computer or a mobile device and have an Internet connection. Users' motivations/purposes for using ICT and social media can also explain this result. As Sims et al. (2017) noted, "older adults often prioritize socially meaningful goals over informational goals" (p. 761). They surveyed 445 participants aged 80+ in the US and found that older people used ICT more to connect with friends/family than to learn information. YouTube is a video sharing site. YouTube users use it for educational, informational, and entertainment purposes, instead of social purposes. This could be another reason why the percentage of the Silent Generation using YouTube is much lower than other generations.

Discussion

In summary, there are generational differences in ICT and social media use behaviors. Two major insights obtained from this study are: (1) the persistence of grey divide and (2) evolving aging cohorts and social media trends. Overall, the percentage for younger generations (Generation X, Y, Z) owning a variety of ICTs are higher than older generations (Boomers and Silent Generation). The grey divide still exists in the U.S., a technologically advanced country. Generations vary in their use of specific social media platforms. However, not all differences reported here correspond to results from

earlier studies. Prensky's (2001) DN vs. DI generational categorization is challenged by the results of this study. This may be due to the changing nature of both technologies and the aging cohorts. This study updates the body of knowledge about generational differences/divide in ICT and social media use.

Differences in technology use can create challenges for intergenerational communication amid the COVID-19 pandemic. In order to provide emotional support and information, communication plays an essential role in a time of public crisis. The grey divide can definitely hinder communicating across generations. If the elderly have difficulties using ICT, they cannot easily communicate with others and thus might feel socially isolated. Generational differences in preferred communication channels (e.g., social media platforms) can also create barriers for effective communication. In order to have two-way communication, multiple stakeholders need to use the same channels. Otherwise, messages sent cannot be received and responded to. In addition to identifying generational divides in ICT use, it is imperative find methods to bridge divides in order to foster communicative resilience among generations. Based on the findings, theoretical implications and strategic recommendations are provided.

Conclusion

Theoretical and Practical Implications

By analyzing survey data collected from five different generations in the U.S., this study brings additional insights into generational differences in ICT and social media use behaviors. Specifically, the scope of this study is broad, because the sample includes all major generations in the U.S. In addition, this study considers generational differences in accessing and using a wide variety of ICTs, such as computers, laptops, tablets, smart phones, game console, and social media.

There are a number of theoretical and practical implications. First, this study brings additional insights into digital divide theory. The results suggest that the grey divide (Friemel, 2016; Hao, 2019) still exists in the U.S. The grey divide persists in different countries, such as Australia (Taylor & Earl, 2016), Canada (Quan-Haase et al., 2018), Switzerland (Friemel, 2016), and the U.S. One question that previous researchers (Mubarak & Nycyk, 2017) asked is how older people in developed and developing countries are affected by grey divide. Mubarak and Nycyk (2017) argued that research into minimizing the grey digital divide in developing countries is crucial. Nevertheless, the result of this study is striking because the findings suggest that there is an obvious grey divide between Silent Generation and other generations, even in the U.S., a developed country. In this case, the persistence of the grey divide not only in developing countries, but also developed countries still needs to be examined. This study adds insights into digital divide literature by focusing on the grey divide in

Second, the results of this study can help organizational leaders and marketers make data-driven decisions about how to segment audiences based on generational cohorts. Testing generational differences in social media use is important, because many organizations use social media as a marketing tool (Hajli, 2014; Stelzner, 2019; Wu, 2020b). Sheth (2020) suggested that the customer engagement method has been impacted by the COVID-19 pandemic. As Sheth (2020) noted, “it is hard to imagine how business could run today without smart phones, the internet, eCommerce, and Zoom meetings” (p. 263). Before the pandemic, there were more offline customer engagement opportunities for business professionals, such as trade shows. However, due to public health concerns, large face-to-face meetings cannot be held. Thus, engaging with customers online, such as connecting and communicating with customers on social media, becomes crucial. To foster business resilience, organizations need to adjust their customer engagement strategies in the online environment. Specifically, organizations/marketers must customize their social media marketing strategies and choose the right social media platforms, based on customer demographics, such as generational cohorts. For example, Snapchat and Instagram are frequently used by Generation Z. If organizations would like to reach and sell products to Generation Z, they may use these two platforms. If organizations would like to build professional relationships with working professionals in Generation X and Generation Y, they may use LinkedIn.

Third, organizations may offer multiple customer care channels, if they have customers in different generations. There is a generational divide/grey divide in ICT and social media use. Organizations cannot only offer online customer care, such as social customer care and chat functions on their websites. Older generations' needs cannot be ignored. If older generations, such as Boomers and Silent Generation, have questions about products or services, they may prefer using the traditional customer care channels, such as calling 1-800 customer service phone numbers. To serve customers in diverse generations, organizations need to offer customer care both online, through various media, and offline, by phone.

Finally, it is important to recognize generational differences in ICT use from the fostering resilience perspective. Different generations have different preferences for using ICTs. Thus, choices and adjustments need to be made to bridge these generational differences/gaps. For example, what if the grandchildren (e.g., Generation Z and Y) prefer online interactions, such as texting by using a smart phone or sending a message via messaging tools, such as WhatsApp, but grandparents (e.g., Boomers and Silent Generation) prefer to talk with them on the phone? As Buzzanell (2018) noted, resilience can be theorized as “adaptive-transformative processes” (p. 14). To foster effective intergenerational communication, family members in older and younger generations need to understand each other's preferred communication channels and adjust their own preferences in order to

adapt to each other. For example, younger generations may decide to talk with older family members on the phone. If possible, grandparents may try to learn how to use some ICTs, such as social media, in order to connect with their grandchildren.

As Sims et al. (2017) noted, older adults' (ages 80+) use of ICT for social purposes can enhance their psychological well-being. Quan-Hasse et al. (2018) also suggested that integrating digital media into older adults' lives can have positive influences on their wellbeing including lower levels of loneliness by strengthening social relationships with others, increasing social capital, getting relevant information, making arrangements, and online shopping. Thus, younger family members may spend time helping older relatives get familiar with digital communication and set up their social media accounts. As Colenda et al. (2020) noted, "resilience, the successful to adversity and to recover from crises with a sustained sense of purpose, has been an increasing focus of aging" (p. 988). The authors also suggested that intergenerational wisdom sharing should not be discounted during the pandemic. For example, grandparents may let their grandchildren understand the many personal sacrifices they made to fight COVID-19. Younger familiar members may also use their technology nativism to assist the elderly to reduce social isolation through video streaming.

Limitations and Suggestions for Future Research

This study has limitations. First, the data of this study was collected in one country, the U.S. In the future, researchers may collect data from different countries and compare the research findings. Second, this study is quantitative in nature. Future studies may use qualitative research methods, such as focus group interviews, in-depth interviews, and observation, to get additional insights about the grey divide. For example, future studies may interview people in Silent Generation in different countries and find out what are the challenges for them to adopt and use ICT, including social media. Although the quantitative research results suggested that there is a grey divide in ICT use, we still need to keep in mind that there are individual differences within the Silent Generation. As Friemel (2016) suggested, individual factors (e.g., income, education, general technical interest) and social factors (e.g., social context, encouragement by family and friends) can affect older adults' Internet use. Previous studies also suggested that there are super agers "who are seniors who have cognitive abilities comparable to people decades younger" (Laise, 2019, p. 18). Thus, super agers may feel it is not difficult to use ICT. Future studies may interview super agers and explore how they learn and use ICT to communicate with others. Future studies may also interview organizational leaders, marketers, and family members to identify effective strategies for bridging the generational divide.

Third, this study mainly focuses on generational differences in ICT and social media use, because the COVID-19 pandemic created unique challenges for intergenerational communication, as many forms of communication (e.g., family communication, workplace communication, customer services) go digital. In addition to

generation, other demographic variables, such as gender (Communello et al., 2016), income (Friemel, 2016) and race (Bank, 2017), may also affect people's ICT and social media use. For example, previous studies (e.g., Duggan, 2015; Murphy et al., 2016) suggested that African Americans are more active users of Twitter than White Americans. Future studies may further explore whether this divide continues by age. Future studies may also examine whether there are differences in the types of activities performed on social media among generations controlling for other factors.

Finally, this study investigates the generational gaps in physical access to ICT (first-level digital divide) and use of ICT (second-level digital divide). Future studies may further explore whether there is an outcome divide (third-level digital divide) across generations. As Scheerder et al. (2017) noted, the third-level digital divide is understudied, and thus needs more scholarly attention. Finally, longitudinal studies should be conducted because the COVID-19 pandemic caused accelerated digital transformation. In order to understand pandemic impacts on ICT and social media uses among different generations, it is important to conduct similar studies and compare the research findings periodically. To foster communicative resilience among different generations, it is imperative to track changes over time and develop adaptable communication strategies with appropriate channels.

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