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Baby boomers and digital literacy: their access to, and uses of, digital devices and digital media

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BABY BOOMERS AND DIGITAL LITERACY:

THEIR ACCESS TO, AND USES OF, DIGITAL DEVICES AND DIGITAL MEDIA

A dissertation submitted in partial satisfaction

of the requirements for the degree of

Doctor of Education in Educational Technology

by

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October, 2014

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This dissertation, written by

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DEDICATION

This is dedicated to my wife, Georgi, for her encouragement, perseverance, emotional strength, and love. I could not have accomplished this feat without you; to my parents for providing me an educational foundation that enabled me to achieve this goal; and to myself: a (Medicare) card-carrying member of the Baby Boomer generation for just doing it!

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And to a teacher at Brother Rice High School, whose name I do not remember and yet, who, in 1967 bet me two cases of beer that I would not graduate from college. I'd prefer a case of Silver Oak cabernet instead. I'm waiting to collect.

Thank you all!

VITA

Richard J. O'Keeffe

EDUCATION

Pepperdine University
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EXPERIENCE

GMR Consultants
Consultant — 2010 to present
Business management consultant working with not-for-profit Boards of Directors. Consultations focus on Board development and Board member responsibility training, communications training, recruiting and developing members.

Pepperdine University — 2008 to 2014
Full-time Ed.D. Student
Studied Educational Technology in Pepperdine's Graduate School of Education & Psychology (GSEP).

SIEMENS Med OCS — 2006 to 2009
Global e-Learning Developer for Sales/Physics Support
Medical Industry: Developed interactive, multimedia DVD, web 2.0-based & mobile e-learning opportunities for Oncology Care sales groups and Physics Support. Responsible for designing course outlines, gathering technical documentation, and developing course workbooks and trainer notes. Deliverables included Trainer Guides, Participant Workbooks, WBT (DVD & interactive multimedia), and video conference (Adobe Connect, MS LiveMeeting).

RJOStudios — 2004 to 2006
Founder/Owner
Multimedia & e-Learning Industry: Provided professional event photography and DVD creation for corporate events, golf tournaments, and family reunions. Designed and produced e-Learning projects to client specifications.

CompUSA — 2002 to 2003
Regional Retail Training Manager/Sales Manager
Big Box Retail Industry: Provided strategic training sales support to Regional Management team. Managed 14 direct reports—(Training Sales Coordinators) and 84 indirect reports (Retail Sales Associates and store Team Members) in a big box technology retail company.

Allaire Corporation 2000 – 2001
Director, Allaire University
Software Industry: Recruited from Dell to establish AU-worldwide as an empowering, strategic organization in the company. Developed the general vision in conjunction with senior management, and executed the programs, policies, and procedures to fully establish this new business unit within the Allaire Corporate environment.

Dell 1998 – 2000
Training Consultant III
Hardware Industry: Recruited from Fujitsu to provide program management of global technical training ensuring product support preparedness to employees and third party support organizations. Program management included review of existing training modalities, evaluation of alternative programs, sourcing, negotiating, and managing vendors.

Fujitsu PC Corporation 1996 – 1998
Technical Training Manager
Customer Service & Support: Hired to manage global technical training group. Management included review of existing training program effectiveness, evaluation of alternative deployment modalities, establishment of knowledge management database program, development of interactive multimedia training programs, and web-based training & support tools.

ComputerLand Training & New Horizons Computer Learning Centers 1985 – 1995
Founder/Owner
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Internet World— Sprint '98 (AT&T IP summit Conference) [audience= 350+]
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ABSTRACT

Digital literacy is fast becoming a necessary skill for mediating life in the 21st century. Digital technologies, digital media, and digital devices have become ubiquitous and intrinsic in modern society and using one to interact with the others requires specific skills—digital literacies—be learned. The purpose of this research was to understand the extent to which Baby Boomers are digitally literate, the digital devices they understand and use, and the purposes for which they are using them.

Residents living in a specific group of age-restricted communities comprised of people 55 years of age and older were e-mailed requests to participate in an online survey. More than 8,200 homes received the invitations and 659 people agreed to participate. The survey consisted of 17 three-part, forced-choice questions and five demographic identifiers. To analyze the data, the researcher used SPSS and ran chi-square tests on each response comparing Older Boomers to Younger Boomers regarding specific digital activities in which they engaged, the device(s) they used, and the frequencies with which they engaged in those activities.

The results of this study indicate that the Baby Boomers in the study possess basic functional digital literacies. They use the Internet daily to read news, check weather, and look up recipes, directions, and medical information. While participation in the various activities was fairly even between both Boomer groups, Younger Boomers tend to send and receive text messages, bank online, pay bills online, search for recipes, save online bookmarks, visit social networks, read blogs, and take online classes more than Older Boomers. The majority of respondents were women, college educated, with annual household incomes of $75,000.00 or more. The most popular digital devices used were laptops, desktops, tablets, and smartphones, respectively and respondents averaged using three different digital devices while engaging in

their digital activities. The trend is toward decreasing use of desktop and laptop computers and a corresponding increase in the use of tablets and smartphones.

Chapter 1: Introduction

Digital technologies, digital media, and digital devices have become ubiquitous and intrinsic in modern society and using one to interact with the others requires specific skillsets—digital/technological literacies (Lankshear & Knobel, 2006). An invitation-only survey conducted jointly by Pew Research and Elon University concluded that by 2020 mobile devices would become the primary digital device for online access (Lankshear & Knobel, 2006). Young adults are most involved with their digital devices and senior citizens, ages 75 and older, are less likely to own digital devices (Purcell, 2011). Most research regarding digital devices addresses individual's extent of use grouped by demographics such as gender, age, education, income, and ethnicity. Little research can be found that addresses the digital literacy of the users.

Digital literacy is fast becoming a necessity skillset for mediating life in the 21st century. The International Technology Education Association's Standards for Technological Literacy states "corporate executives and others in the business world, brokers and investment analysts, journalists, teachers, doctors, nurses, farmers, and homemakers all will be able to perform their jobs better if they are technologically literate" (ITEA, 2000/2002). Jones-Kavalier and Flannigan (2006) have stated "In our 21st century society—accelerated, media-saturated, and automated—a new literacy is required, one more broadly defined than the ability to read and write" (p. 8). The ability to confidently use, participate in and understand digital media and services is becoming an important prerequisite to effective participation in the digital economy (Australian Communications and Media Authority, 2009). The National Academy of Engineering and the National Research Council joint report, *Technically Speaking*, states "technological literacy is complex and encompasses three interdependent dimensions: (1) knowledge; (2) ways of thinking and acting; (3) capabilities" (Pearson & Young, 2002). As further evidence of the growing

importance of digital literacies, the California Emerging Technology Fund (CETF) established a Digital Literacy Initiative that produced an Information and Communications (ICT) Digital Literacy Assessments and Curriculum Framework (2008) "to provide a standardized approach for assessment, diagnosis, and continuous improvement of basic information and communications (ICT) digital literacy skills for students and the workforce" (Digital Literacy Assessments, n.d., para 1). The framework is established upon three points:

- "The definition of digital literacy in the *California Policy for ICT Digital Literacy*.
- A recognition that all residents of the state benefit from being ICT digitally literate in school, the workplace and 21st century life.
- Adoption of global standards and performance indicators for ICT digital literacy" (Digital Literacy Assessment, n.d., para #1).

Problem Statement

Digital technologies, digital media and digital devices have become ubiquitous and intrinsic in modern society and using one to interact with the others requires specific skillsets—digital literacies—be learned (Lankshear & Knobel, 2006). Generation Z was born into them. The Millennials (Generation Y) readily adopted them. Gen Xers easily and quickly learned them. Seniors, those born prior to 1946, reportedly want little to do with them. What about Baby Boomers? With this large group of individuals becoming seniors and the digital world that we are living in, it is critical that boomers become digital literate. For example, Baby Boomers will want to communicate with their families and use various apps and social media tools make that communication easier, less expensive, and more efficient than previous methods of familial communication. Facebook, Skype, Twitter, and texting are replacing telephone calls and USPS

mail. Posting photos on Instagram is replacing sending printed photos via USPS mail. Comparative shopping using digital devices that read bar codes and tags are enabling consumers to compare prices from various merchants without leaving the comfort of their homes. Medical appointments can be made online, medical test results can be viewed online, and prescriptions made, filled and delivered via digital devices. Personal fitness plans can be prescribed, monitored and evaluated remotely making healthy lifestyles more easily attainable. Some of these apps and social media tools can be used for intergenerational communications that seem, from casual observation, to be occurring among grandparents and their grandchildren.

Using these digital tools requires knowing how to use them: it requires digital literacy.

Various apps exist that can provide Baby Boomers with helpful services such as apps that serve as reminders to take medications, keep appointments, or locate automobiles in unfamiliar neighborhoods or shopping mall parking structures. Also, there may be financial ramifications in that retail stores are beginning to send digital notification (text messages) regarding sales and special promotions directly to customers' digital devices. Grocery stores are now enabling customers to shop online and either pick up their purchases upon arrival at the store or have the purchases delivered to them. Using each of these digital device tools and apps to engage in these various activities requires a basic digital literacy.

Baby Boomers are people born between 1946 and 1964. They have been segmented into "younger boomers" (ages 47 to 56) and "older boomers" (ages 57 to 65) by Pew. They are becoming Senior Citizens (age 65) at a rate of one every 10 seconds. "(They) control 70% of the total net worth of American households resulting in $7 trillion of wealth and (they) account for a dramatic 40% of total consumer demand" (Todays Digital Solutions blog, 2013, para 2). "Recent research by the Pew Internet Project has shown that among current Internet non-users, about half

say the main reason they don't go online now is because they don't think the Internet is relevant to them" (Zickuhr & Smith, 2012). Do Baby Boomers possess the digital literacy necessary to successfully navigate today's digital world?

Baby Boomers have history with innovation. They watched television when there were only three networks and the images were presented in black and white. They gathered together to marvel when those black and white programs were presented "in living color." They played the same music on 45 and 33 RPM records, then eight-track tapes, followed by cassette tapes and then CDs, and, most recently, MP3 streams. Many inventions were designed and products created during the Boomers' lifetimes each of which required time for general acceptance and adoption also known as the rate of diffusion. Those inventions that did gain wide range adoption took various numbers of years to reach the point of near saturation. It took roughly 45 years for electrification to reach 90% of the United States population and it has taken less than 10 years for cell phones to do so.

As cell phones morph into smart phones, their capabilities exceed mere conversations and enable sending instant text messages, taking and sharing photographs, conducting banking transactions, shopping, and making appointments for everything from manicures to medical office visits. Smartphones are essentially computers that also enable remote conversation. Smartphones are powered by computer-like chips running computer-like operating systems that include Internet web browsing capabilities; that enable owners to create, consume and store all sorts of digital information; that make possible access to work-related documents; and that facilitate editing, saving, and sharing all things digital. Following on the heels of smartphones are tablet devices: similar to smartphones in computer-like capabilities only smaller and lighter than PCs while slightly larger than smartphones. Tablets are rapidly replacing laptop and

notebook computers. These devices fuel the "always online" nature of today's digital society. Understanding and operating them is a basic literacy requirement. As they evolve and proliferate, they can become confusing to operate. This can pose as a motivator for avoidance particularly for Baby Boomers (who are becoming senior citizens at a rate of nearly 10,000 per day). Fully participating in today's digital society requires successful operation of digital devices and, in turn, a general digital literacy to understand and use digital devices to access digital media to successfully engage in today's digital society.

Purpose Statement

The purpose of this research was to comprehend the extent to which Baby Boomers are digitally literate, the digital devices they understand and use, and the purposes for which they are using them. The study utilized instruments used during the ongoing Pew Research Center's Internet & American Life Project. Specifically, the study sought to infer the extent to which Baby Boomers are digitally literate by assessing the digital devices they use, the extent to which they use them, and the purposes for which they use them.

Recent Statistics

During 1993, the Office of Engineering and Technology (OET) of the Federal Communications Commission issued a clairvoyant statement in the opening remarks of OET Bulletin No. 62 entitled *Understanding the FCC Regulations for Computers and Other Digital Devices*:

> Digital technology is used virtually everywhere. Coffee pots, wristwatches, automobiles, cash registers, personal computers, telephones, and thousands of other types of common electronic equipment rely on digital technology to function. At any time of the day, most

people are within a few feet of consumer products that use digital technology (FCC OET, 1993).

Even then, we were at the very beginning of an "always on" digital society. As tablet devices begin to provide more portability and capability, they are gaining acceptance in many professions. According to the Jackson & Coker Industry Report of April 2011, 75% of American physicians have purchased an iPad, iPhone or iPod and that 81% of physicians use some sort of smartphone. The University of California Irvine School of Medicine and Stanford University's School of Medicine are providing incoming students with iPads. Smartphones are becoming the single most used digital device. According to Pew Research Center's Internet & American Life Project, 84% of the adult populations age 50-64 own a cellphone or smartphone as do 57% of adults age 65+. They use their devices for a range of online activities (Purcell, 2011) as shown in Table 1.

Table 1

Percent of Cell Phone Owners Who Engage in Various Activities on Their Phones

Activity	Age 50-64 (%)	Age 65+ (%)
Send/receive text messages	57	19
Take a picture	67	34
Access the Internet	18	10
Play music	13	6
Play a game	17	9
Record a video	14	5
Send/receive email	22	11
Use a social networking site	8	3
Send/receive instant messages	17	10
Watch a video	6	4
Post a photo or video online	5	2
Use a status update service	3	2
Make a purchase	4	5

Beginning January 1, 2011, the oldest Baby Boomers began turning 65 years of age, officially becoming senior citizens. Daily, for the next 19 years, approximately 10,000 more will join the new generation of senior citizens. Seventy-nine million Baby Boomers account for 26% of the American population (Cohn & Taylor, 2010). Pew's project, Internet & American Life states that only 3½% of Baby Boomers own tablet devices, while 46% own laptop computers and 64 ½% own desktop computers; and 85% own cell phones (Zickuhr, 2011). The American Association of Retired People (AARP) commissioned a national study "to better understand their (senior citizens) use of social media and technology" (Smith, 2014) and determined that 17% of Baby Boomers consider themselves "extremely comfortable" using the Internet. Twenty-three percent responded "very comfortable," 21% "somewhat comfortable," 9% "not very comfortable," 13% "not at all comfortable," and 17% "do not use the Internet." During the same study, AARP determined that 57% use a desktop computer to access the Internet, 26% use a laptop, 4% use a smartphone, and 1% use a tablet or iPad. In a study conducted jointly by Microsoft and AARP, 57% of Baby Boomers blamed manufacturers for "creating unnecessary complexity" in their devices stating that the devices provided "too many features" (Rogers, 2009).

Research Questions

How do older Baby Boomers (born 1946 to 1954) compare to younger Baby Boomers (born 1955 to 1964) in their digital literacies? What activities do Baby Boomers engage in using their digital devices? What digital device(s) do they use to access digital media? And, with what frequencies do Baby Boomers engage in these digital activities?

Significance

"Baby Boomers control 70% of the total net worth of American households resulting in

$7 trillion of wealth and (they) account for a dramatic 40% of total consumer demand" (Todays Digital Solutions blog, n.d.). By 2015, those aged 50 and older will represent 45% of the U.S. population. In the next ten years, U.S. baby boomers will increase their annual spending on wellness-based services from approximately $200M to $1 trillion (Pilzer, 2001).

As Baby Boomers continue crossing over into senior citizenry, the technological landscape will continue growing more powerful, more capable, and with uncertain user-interface designs. Technological advances will bring with them devices that will permeate nearly every aspect of American life. Digital literacy is becoming a functional necessity.

> Early during 2011, the U. S. Social Security Administration said it would stop sending paper statements to Americans explaining their Social Security benefits. Instead, such statements would be available online. As part of a broader government policy, Social Security will also be ending paper-based benefit checks by May 2013 (Moeller, 2011).

Some of those Baby Boomers, who have become senior citizens, may be challenged when applying for Social Security benefits if they are less than digitally literate. Perhaps it would benefit Baby Boomers to learn and demonstrate baseline digital literacies. Other Baby Boomers might demonstrate moderate to advanced digital literacy (knowledge and skills). By studying and reporting about the current definitions of digital literacy and availability of digital literacy assessment tools, and by comparing previous studies to current data, this research presents a contemporary view of Baby Boomers and their digital literacies and digital device uses. Baby Boomers' digital capabilities and intentions may contribute to manufacturers' equipment designs and developers' interface designs ultimately creating devices that encourage Baby Boomers to interact more fully with their digital environments.

Key Definitions

Baby Boomers: people born between 1946 and 1964.

Older Boomers: people born between1946-1954.

Younger Boomers: people born between1955-1964.

Technology adoption: The choice to acquire and use a new invention or innovation.

Technology literacy: The ability to responsibly use appropriate technology to communicate, solve problems, and access, manage, integrate, evaluate, and create information thereby improving learning in all subject areas and acquiring lifelong knowledge and skills for active participation in the 21st century.

Digital literacy:

> The ability to understand technology and to perform tasks effectively in a digital environment, with the term 'digital' meaning information represented in numeric form and primarily for use by a computer. Digital literacy includes the ability to read and interpret (digital) media (text, sound, images, et al.), to reproduce data and images through digital manipulation, and to evaluate and apply new knowledge gained from digital environments (Jones-Kavalier & Flannigan, 2006).

ICT literacy: "Using digital technology, communications tools, and/or networks to access, manage, integrate, evaluate, and create information in order to function in a knowledge society" (Educational Testing Services, 2007, p.2).

Digital device: something made for the purpose of enabling interactivity with digital data (cell phones, smart phones, computers, notebook computers, netbook computers, and tablets).

Diffusion: The process and rate thereof by which something new spreads throughout a population.

Operational Definition

This research used the Jones-Kavalier and Flannigan (2006) definition of digital literacy as its operational definition because it summarizes most other definitions succinctly.

> Digital literacy is a person's ability to perform tasks effectively in a digital environment, with the term 'digital' meaning information represented in numeric form and primarily for use by a computer. Literacy includes the ability to read and interpret (digital) media (text, sound, images, et al.), to reproduce data and images through digital manipulation, and to evaluate and apply new knowledge gained from digital environments (Jones-Kavalier and Flannigan, 2006, p. 9).

Key Assumptions

Some Baby Boomers use digital devices (cell phones, smartphones, computers and tablets) to communicate with each other, family and friends; to research areas of interest; to conduct banking; to make appointments and travel reservations; and to make online purchases.

Some Baby Boomers do not use their digital devices to the extent that the device is capable of being used.

Some Baby Boomers do not use digital devices.

Some Baby Boomers would like to use their digital devices more effectively.

Some Baby Boomers do not want to use digital devices.

Limitations

This research was limited to a population of Baby Boomers who live in middle-class, age-restricted communities built and managed by Shea Homes® that are located in California, Washington, Nevada, Arizona, and Florida. Participants were selected from a group of volunteers. Participants were exclusively Baby Boomers defined as those born between January

1, 1946 and December 31, 1964. Participants responded to an instrument comprised of survey questions used by the Pew Center's Internet & American Life Project. The study did not discriminate with the exception of age confining participation to Baby Boomers living in the Shea Homes Trilogy age-restricted communities.

Summary

Digital technologies, digital media and digital devices have become ubiquitous in modern society and using one to interact with the others requires specific skillsets—digital literacies—be mastered (Lankshear & Knobel, 2006). Many definitions exist for 21st century literacy. The National Academy of Engineering and the National Research Council Joint Report (2003), *Technically Speaking*, states "technological literacy is complex and encompasses three interdependent dimensions: (1) knowledge; (2) ways of thinking and acting; (3) capabilities" (Pearson & Young, 2002, p. 15). Digital literacy is also encompassed in the broad realm of Information Communication Technology (ICT) and as such, is defined by the ICT Literacy Panel as "ICT literacy is using digital technology, communications tools, and/or networks to access, manage, integrate, evaluate, and create information in order to function in a knowledge society" (ETS, 2007, p. 2).

This study deals exclusively with digital literacy as defined by Jones-Kavalier and Flannigan (2006):

> Digital literacy represents a person's ability to perform tasks effectively in a digital environment, with the term 'digital' meaning information represented in numeric form and primarily for use by a computer. Literacy includes the ability to read and interpret (digital) media (text, sound, images, et. al.), to reproduce data and images through digital

> manipulation, and to evaluate and apply new knowledge gained from digital environments (Jones-Kavalier and Flannigan, 2006, par. 10).

Baby Boomers have history with innovation. Many inventions were designed and products created during the boomers' lifetimes. Baby Boomers are becoming senior citizens and senior citizens have long been associated with behavioral challenges when dealing with high technology devices. Previous studies have identified some of the uses, extent of uses, and frequencies of uses of Internet users in general and include a small representation of the Baby-Boomer population in particular (Purcell, 2011). These studies were broad and shallow in regard to addressing Baby Boomers as a specific demographic. Little research has focused on how and with what frequency Baby Boomers interact with the digital world of today. This lack of research presents an opportunity to conduct narrow and deep research regarding Baby Boomers and their digital literacies as exemplified by their uses of digital devices, the digital device activities in which they engage, and the frequencies with which they engage in those activities.

Chapter 2: Literature Review

A New Generation of Senior Citizens

Based upon recent research, older adults use the Internet less than younger adults (Czaja, et al., 2006; Selwyn, Gorard, Furlong & Madden, 2003). The number of senior citizens as a demographic is growing and this group may be averse to using new information technology (Hawaii International Conference on System Sciences, 2005). The 2000 edition of the "Falling Through the Net," a report from the U. S. Department of Commerce, indicated that people aged 50 and older were among those groups who are least likely to be Internet users.

> Senior citizens have been typically slow to use new technologies and as the first of 79 million Baby Boomers reach age 65 and become 'officially' senior citizens, they will challenge us to rethink how we use the web and how we engage older people to use new technologies. Baby Boomers may confront society and defy what we think it means to 'get old' (Carracher, 2011, para 1).

"Regarding teaching baby boomer/senior citizens digital literacies, the senior population, like late adopters of 'newfangled gadgets,' slowly approach the new literacy like they might a foreign language that is complex and of questionable use" (Jones-Kavalier & Flannigan, 2006, p. 3). Prensky (2001) described "non-IT-literate individuals as burdened with an accent—non-native speakers of a language, struggling to survive in a strange new world" (p. 2).

A 2006 study, designed to assess this perception, employed Davis's (1989) technology adoption model (TAM) in which perceived usefulness is recognized as the most significant predictor of end-user new technology adoption intention. It concluded that perceived usefulness and ease of use were successful predictors of end-user new technology adoption. That study was conducted five years before the first Baby Boomer became a senior citizen. Figure 1 displays the

rates of diffusion of various technological innovations. Note how rapidly cell phone use was adopted. As more digital technologies are introduced, how likely or unlikely are Baby Boomers to continue the senior citizen tradition of reluctance to use new information technology?

There are nearly 80 million Baby Boomers (persons born between 1946 and 1964) according to the United States Census (2014). Baby Boomers account for the largest single demographic segment of the U.S. population in history. Beginning January 1, 2011, Baby Boomers are becoming senior citizens at a rate of nearly 10,000 per day. How will Baby Boomers affect the senior citizen population and its general aversion to using new technologies? In 2003, the University of California, Los Angeles' Center for Communication Policy determined that Internet use was more popular among those 56 and older than among teens (Cole, 2003). The 57 year olds who participated in the study are now becoming 65-year-old Baby Boomer senior citizens.

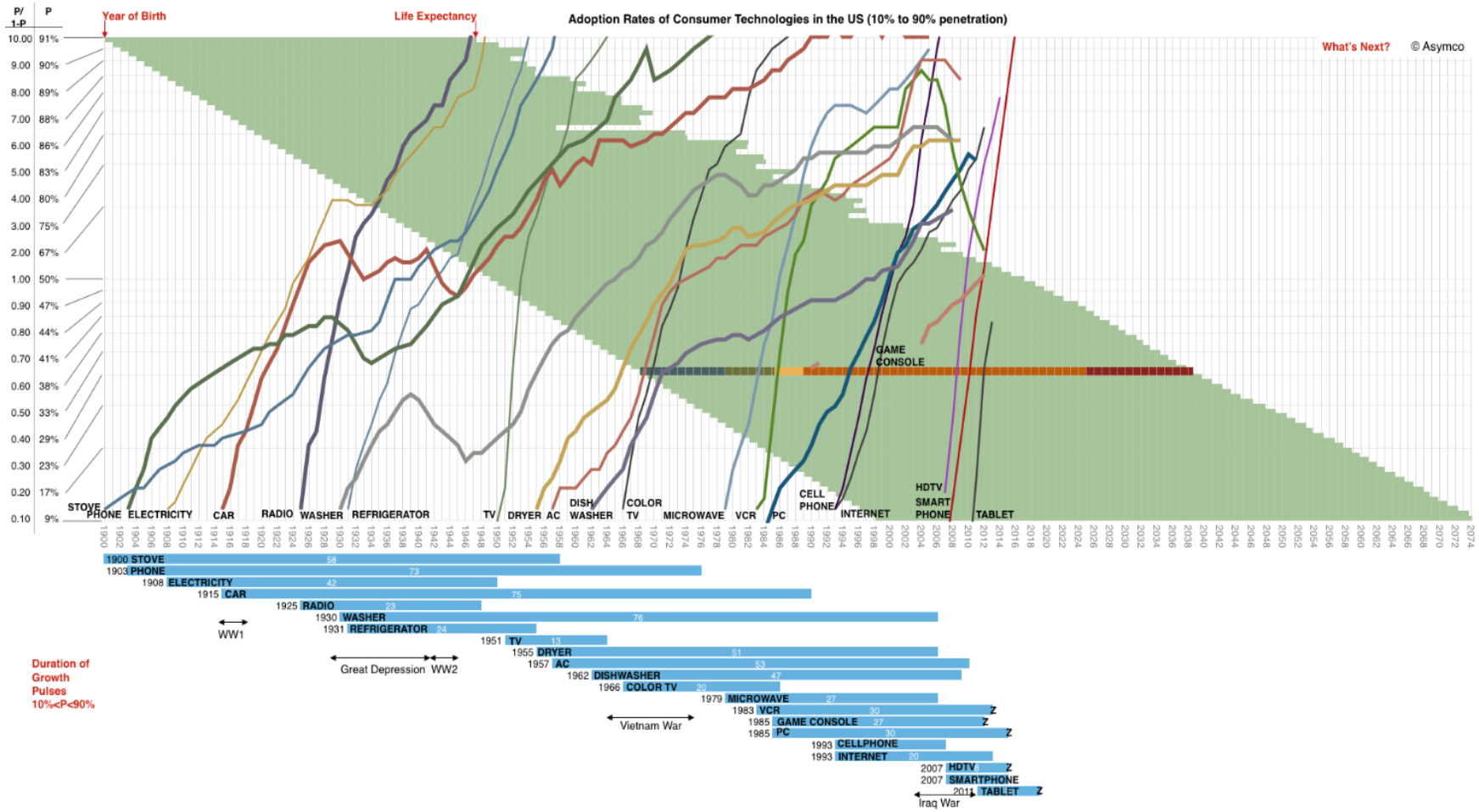


Figure 1. Speed of adoption of technologies. From "Seeing What's Next," by H. Dediu, November 18, 2013, *Asymco*. Copyright 2013 by *Asymco*. Reprinted with permission.

The convergence of Internet accessibility and digitization of nearly everything written, watched, or listened to paved the way for increasing demand for mobile access. During 1990, there were 12.4 million mobile phone subscribers and 2.8 million people used the Internet worldwide (Worldmapper, n.d.). Twenty years later, during 2010, the number of mobile phone subscribers reached 4 billion and 1.8 billion people use the Internet worldwide (Internet World Stats, n.d.).

As seen in Figure 1, the Internet is history's first innovation to earn widespread acceptance in a short period of time. Smartphone technology and its attributes may surpass the Internet in acceptance rate. Various providers, marketers and research organizations, in order to access and reliably predict the features most desired by the general public, are conducting smartphone research now. Forrester conducted a study in 2008 that measured the U.S. Household Technology Adoption Rate and forecast it through 2013 as seen in Table 2.

Table 2

Forrester Study of Household Technology Adoption Rates & Forecasts

Device	2005	2006	2007E	2008E	2009E	2010E	2011E	2012E
Mobile Phone	84.5%	89.7%	94.5%	98.4%	101.1%	103.0%	104.6%	105.9%
PC	85.6%	86.9%	91.1%	94.7%	97.5%	99.6%	103.1%	102.7%
Camera phone	28.1%	41.6%	67.4%	83.3%	90.5%	93.7%	95.5%	96.9%
Internet	79.7%	81.3%	85.1%	88.4%	91.2%	93.3%	95.0%	96.5%
Digital camera	57.0%	66.3%	74.8%	81.5%	86.5%	90.2%	93.0%	95.2%
Laptop	32.6%	36.4%	43.4%	50.2%	55.8%	60.0%	62.9%	65.0%
MP3 player	21.8%	33.5%	40.1%	43.9%	45.8%	47.0%	47.8%	48.4%
Satellite radio	10.2%	12.7%	17.2%	21.8%	25.5%	28.1%	29.8%	31.0%
US Households	111.8	113.1	114.4	115.7	117.1	118.4	119.8	121.2

Note: Adapted from "Forecast: US Household Technology Adoption, 2007 to 2012," by C. Golvin, T. Schadler, R. Fiorentino, & H. Lo, 2007, *The State of Consumers and Technology: Benchmark 2007,* p. 3. Copyright 2007 by Forrester Research.

Previous studies have identified some of the uses, extent of uses, and frequencies of uses of Internet users in general and include some of the Baby-Boomer population in particular (Rogers, 2009). These studies were broad and shallow in addressing the Baby Boomer demographic. Little research has focused on how and with what frequency Baby Boomers interact with the digital world of today. This lack of research presents an opportunity to conduct narrow and deep research regarding Baby Boomers and their digital literacies, and digital devices of choice, and their uses thereof.

Baby Boomers are becoming senior citizens and senior citizens have long been associated with behavioral challenges when dealing with electronic devices. As Baby Boomers reach retirement age, the senior citizen population will grow significantly. There are approximately

77.6 million Baby Boomers that account for 28% of the U.S. population. According to AARP, by 2015, Baby Boomers/senior citizens will account for nearly 45% of the population.

Past studies have shown a general increase in the number of senior citizens using digital devices and a similar increase in the range of activities for which they are used (Charness, Shumann, & Boritz, 1992; Czaja, 2007). Research also implies that there are some obstacles seniors face in their efforts to use digital devices and their interactions with digital media exacerbated by the seniors own perception of (the extent of relevant) usefulness and (difficult) usability. (Czaja, Lee, Nair, & Sharit, 2008; Czaja, Nair, Ownby, Roth, & Sharit, 2001; Davis, Bagozzi, & Warshaw, 1989; Zajicek, 2007).

The Baby Boomer population has not been studied in depth insofar as their technical competencies. What digital literacies did this population learn and what do they accomplish using these skills? What devices, activities, and uses are available to them that they do not use?

How do these Baby Boomers turned new senior citizens negotiate their daily routines in the digital world, a world that increasingly requires mounting use of digital devices in every aspect of life? For example, Kaiser Permanente® is encouraging patients to make appointments online. Banks are distributing paperless account statements via email, encouraging electronic bill paying, and encouraging online deposits (Wells Fargo, BofA, Chase). Grocers are emailing discount coupons and "loading" discounts on loyalty cards rather than printing them in newspapers and magazines (Safeway, Ralph's, Kroger). Families are communicating more via Facebook®, Twitter® and instant messaging (IM) than USPS postal mail or telephone (Barnes, 2003). The United States Postal Service plans to close 3,700 post offices in the near future (U.S. Postal Service website, n.d.) In order for this new crop of senior citizens to interact in today's

society, they must possess baseline digital literacy. Technological literacy is vital to individual, community, and national economic prosperity. How are these literacies defined and measured?

"(Digital literacy) is defined as comprising a variety of cognitive skills that are utilized in executing tasks in digital environments such as surfing the web, deciphering user interfaces, working with databases, and chatting in chat rooms" (Eshet-Alkali & Amichai-Hamburger, 2004). "(ICT literacy) is the ability to use technology to develop 21st century content knowledge and skills, in support of 21st century teaching and learning" (National Education Association, 2010).

Research, in an effort to find digital literacy assessment guidelines, strategies, and tools, can produce many and varied examples, the complexities of which are further confounded by the various terms and descriptions of technologies literacies (information literacy, ICT literacy, computer literacy, digital literacy, media literacy). Still further muddying the waters are the interchangeable uses of "literacy," "competence," and "skill" used for describing what is to be measured to determine knowledge about the digital domain and its interfaces and devices.

The Global Digital Literacy Council (GDLC) is collecting the knowledge of experts worldwide to help create a general literacy definition based upon the best practices and requirements of education, test development, and industry based further upon the vendor-neutral assessments from the Internet and Computing Core Certification (IC3) presently used in 60 countries. Recognized as the first globally accepted standard of measurement, IC3 is endorsed by the International Society for Technology in Education (ISTE).

Microsoft offers a Digital Literacy Curriculum consisting of basic, standard and advanced curricula in service to enable "(people) to learn the essential skills to begin computing with confidence, be more productive at home and at work, stay safe online, use technology to

complement your lifestyle, and consider careers where you can put your skills to work." (Microsoft Digital Literacy, n.d.) Syracuse University hosts a website for their Center for Digital Literacy to promote research and development for the Information Age (Center for Digital Literacy, n.d.). Additional resources for assessing digital skills include: ICT Digital Literacy Assessment and Training Resources, California ICT Digital Literacy Assessments and Curriculum, and a study survey of digital literacy assessment instruments by Covello (2010).

The California Emerging Technology Fund (CETF) contracted an ICT Digital Literacy Initiative that in 2008 proposed a standardized approach to assessment, diagnosis, and continuous improvement of ICT digital literacy skills for students and the workforce. It defined digital literacy as the "ability to use digital technology and communications tools, and/or networks to access, manage, integrate, evaluate, create, and communicate information in order to function in a knowledge society" (Kempster Group, 2008, p. 3) and based the elements, definitions, and competencies upon the basic elements of digital literacy as shown in Table 3.

Table 3

Digital Literacy Standards

Elements	Definitions	Competencies
Access	Knowing about and knowing how to collect and/or retrieve information.	Search, find, and retrieve information in digital environments.
Manage	Apply an existing organizational or classification scheme.	Conduct a rudimentary and preliminary organization of accessed information for retrieval and future application.
Integrate	Interpreting and representing information—summarizing, comparing and contrasting.	Interpret and represent information by using ICT tools to synthesize, summarize, compare, and contrast information from multiple sources.
Evaluate	Making judgments about the quality, relevance, and usefulness, or efficiency of information.	Judge the currency, appropriateness, and adequacy of information and information sources for a specific purpose (including determining authority, bias, and timeliness of materials).
Create	Generating information by adapting, applying, designing, inventing, or authoring information.	Adapt, apply, design, or invent information in ICT environments (to describe an event, express an opinion, or support a basic argument, viewpoint or position).
Communicate	Communicate information persuasively to meet needs of various audiences through use of appropriate medium.	Communicate, adapt, and present information properly in its context (audience, media) in ICT environments and for a peer audience.

Note: Existing international and national digital literacy frameworks and assessment instruments all share these common elements.

As standards continue being recommended, performance indicators are being designed and tested. Pilot projects are underway at California State University institutions with Educational Testing Services (ETS) acting as assessment developers along with International Computer Driver's License-United States (ICDL-US) and Certiport. Additionally, other California Community Colleges and some employers are conducting pilot projects that assess various ICT skills assessments for work competencies.

The Association of College and Research Libraries (ACRL), a division of the American Library Association (ALA) is a key source for standards and performance indicators of ICT digital literacies. The ALA Standards Committee and Board of Directors approved five standards and twenty-two performance indicators as seen in Table 4.

Table 4

Digital Literacy Indicators

Standard	**Indicator**
Know	Define and articulate the need.
Access	Access the information, service, or activity effectively and efficiently.
Evaluate	Critically evaluate and incorporate information into personal knowledge base and value system.
Use	Use effectively to accomplish a specific purpose.
Ethical/Legal	Understand many of the ethical, legal, and social issues surrounding the use of information and accesses and uses it ethically and legally.

For purposes of this study, three of the ACRL standards are used to measure the digital literacy of Baby Boomers:

1. Know. The digitally literate Baby Boomer defines and articulates the nature and extent of the information, service or activity needed.
2. Access. The digitally literate Baby Boomer accesses and engages in needed information, services or activities effectively and efficiently.
3. Use. The digitally literate Baby Boomer effectively uses a digital device to accomplish a specific digital media-based task or activity.

The primary method of this research is a survey. The instrument is comprised of questions based upon the Pew study Internet and American Life Project. Some of the Pew survey

questions have been modified toward greater specificity to Baby Boomers and their specific uses of digital devices and digital media-based activities.

During 2009, Lee Rainie, Director of Pew Internet Project Silver Summit, discussed "present day" usage among Baby Boomers: 74% use the Internet, 62% have broadband at home, 72% own a cell phone, 43% connect to the Internet wirelessly, 47% use "the cloud" essentially demonstrating the groups' desire for fast connections that are moving to outside servers and storage. He further presented that boomers represent 36% of the Internet population and 33% of Internet traffic on a typical day, that 52% go online daily, 35% online several times each day and more than 41% go online from time-to-time "just for fun." It may be said that more and more Baby Boomer seniors are using the Internet and digital devices to access digital media. In 2010, Mary Madden, Senior Research Specialist, Pew Internet & American Life Project, reported that

> Social networking use among Internet users age 50 and over has nearly doubled—from 22% to 42% over the past year. Half the online adults ages 50-64 count themselves among the Facebook and LinkedIn masses. That's up from just 25% who reported social networking use one year ago in a survey conducted in April 2009 (Madden, 2010, p. 3).

How will these numbers trend? This research will contribute toward answering that question!

Basic Literacy

Mastering "the three Rs," (reading, 'riting and 'rithmetic) has long been associated with establishing evidence of literacy. Since the Greco-Roman world, literacy was defined as "knowing letters." "In every society which possesses writing, a line can be drawn between the literate and the illiterate populations and there are infinite gradations of literacy for any language" (Harris, 1989). It could be said that being literate enables one to communicate on more levels than being illiterate. There are topical literacies: religious literacy, economic literacy,

scientific literacy, political literacy and each requires learning specific to the topic. Writing about religious literacy, Prothero (2008) found that only 10% of American teenagers can name all five major religions and 15% cannot name any, making the U.S. a religious society, while at the same time a nation of religious illiterates. One could draw the conclusion that religious literacy requires rigorous studies about the world's religions.

Economic literacy requires a sound grasp of economic theories (microeconomics, supply and demand, fiscal policy, monetary policy, the economy as a whole). Scientific literacy requires study in fields of science and political literacy demands knowledge in the nuances of politics. Many Americans are literate in that they can read, write, and perform some calculations. They can communicate with other literate Americans. However, "the digitization of nearly everything" (Ogg, 2007) is making digital clouds that can only be accessed using digital devices. There are numerous digital device types and various digital device interfaces. There is a digital language used to describe these devices and required to use, successfully and beneficially, these devices. There is a new literacy—a digital literacy.

Digital Literacy

Digital literacy is a concept still being defined in many versions by many proponents.

> Digital literacy represents a person's ability to perform tasks effectively in a digital environment, with the term 'digital' meaning information represented in numeric form and primarily for use by a computer. (Digital) literacy includes the ability to read and interpret (digital) media (text, sound, images, et al.), to reproduce data and images through digital manipulation, and to evaluate and apply new knowledge gained from digital environments (Jones-Kavalier & Flannigan, 2006).

Jones and Flannigan further posit:

> digital literacy refers to an assortment of cognitive-thinking strategies that consumers of digital information utilize. It includes the ability to 'read' instructions from graphic interfaces ('photo-visual literacy'), to use the computer's digital reproduction capability ('copy & paste') in order to form genuine-creative products ('reproduction literacy'), the flexibility of thinking that enables learners to construct knowledge from hypertextual, non-linear navigation through knowledge domains ('lateral literacy'), and the ability to critically evaluate and assess the quality of digital information ('information literacy'). Digital literacy is the ability to understand and use information in multiple formats from a wide range of sources when it is presented via computers… (Not) only must you acquire the skill of finding things, you must also acquire the ability to use those things in your life. Acquiring digital literacy for Internet use involves mastering a set of core competencies: new media literacy, information literacy, lateral literacy (hypermedia and thinking), photo-visual literacy, and reproduction literacy. Taken together these literacies define "today's literacy" as reported by the Educational Testing Service's Center for Global Assessment: "the ability to use digital technology, communications tools, and/or networks to access, manage, integrate, evaluate, and create information in order to function in a knowledge society (ETS, 2007).

It is this definition that characterizes digital literacy and it is this definition that this research will employ while analyzing the data. Becoming digitally literate has become easier in that organizations are being formed to address establishing consensus of definitions of digital literacy. One such is the Information and Communication Technologies (ICT) Digital Literacy website. The site provides a rich, centralized portal for the repository of ICT resources,

highlights innovative efforts and partnerships promoting ICT Literacy, and facilitates the interaction among researchers, business, government and educational segments. (Kempster Group, & Links America Foundation, n.d.). Another resource is the Institute for Multimedia Literacy: Annenberg Center for Communication, University of Southern California. The Institute

> collects and supports pioneering research and development efforts designed to embrace the transformative potential of today's literacy—an expended, multimedia literacy in which the ability to read and write in images, sound, interactivity, and movement is held to as high a standard as learning the reading and writing of text. The Institute's scholarly projects and academic programs examine and articulate the social, cultural, and practical implications of what it now means to be literate in the twenty-first century (Kempster Group, & Links America Foundation, n.d.).

The Institute's activities center on four major goals:

- Understanding and articulating multimedia literacy;
- Examining what it means to be a multimedia scholar;
- Studying the impact and implications of multimedia literacy and scholarship;
- Designing programs to promote multimedia literacy and scholarship.

Bawden's 2001 article "Information and Digital Literacies: A Review of Concepts" refers to new literacies that are "needed to deal with our ever-increasingly complex world" (Bawden, 2001). His definitions include computer literacy, library literacy, network literacy, Internet literacy, and hyper literacy. The 21st Century Workforce Commission's (2000) National Alliance of Business (NAB) stated the implications of establishing digital literacy: "The current and future health of America's 21st century economy depends directly on how broadly and deeply Americans reach a new level of literacy—21st century literacy" (NAB, p. 9).

The Obama Administration believes so strongly in the need for digital literacy of all Americans that it has established a Digital Literacy portal to serve as a resource to all providing digital literacy training and services.

> Jumpstarted by a federal interagency working group dedicated to spurring the advancement of digital literacy across all age groups and stages of learning, the Digital Literacy portal organizes content conveniently, enables valuable discussion and collaboration among users and elevates best practices to improve the quality of digital literacy offerings (U.S. Department of Commerce, n.d.).

Working group members include: U.S. Department of Commerce, U.S. Department of Education, U.S. Department of Energy, Federal Communications Commission, U.S. Department of Health and Human Services, U.S. Department of Housing and Urban Development, U.S. Department of Labor, Institute of Museum and Library Services, Corporation for National and Community Services, and the U.S. Department of Agriculture. By all accounts, digital literacy is becoming a necessary 21st century survival skill. In addition to achieving digital literacy, Baby Boomers must have digital access.

Benefits of Access

There are countless benefits to Internet access; a few are the availability of huge amounts of information regarding nearly any topic: shopping from home to the world's millions of vendors, watching videos old and new, listening to music, speeches and stories; grocery shopping, banking, communicating with friends and strangers worldwide, virtual visits to places far away, learning about nearly anything one desires to know about, looking up medical information and family histories. It is impossible to list all the benefits to Internet access.

One important benefit of access to participation in the digital environment is increasing one's fluency in the language of digital literacy, enabling more broad participation and collaboration in the digital environment. Advanced Communications Law & Policy Institute (ACLP) presented three categories of benefits that are enabled with broadband access and adoption: social impacts, economic impacts, and healthcare and well-being impacts. Among the social impacts are increased connectivity with family and friends, interactive outlets to the world, feelings of relevance, and enhanced personal communications (which can decrease feelings of depression and isolation). Economic impacts presented included individual gains from e-commerce, personal online financial management, prescriptions savings, and enhanced employment opportunities. Healthcare and well-being impacts presented included lifesaving and life-enhancing telemedicine services and potential cost-savings "flowing from increased usage of broadband-enabled healthcare services" (Davidson & Santorelli, 2009).

Barriers To Access

One barrier to access and participation in the digital environment rests upon one's digital literacy. Baby Boomers occasionally overlook the need to increase their levels of digital literacy because they believe they can simply continue performing certain tasks even if not in the most efficient or effective manner.

The present administration sees digital literacy as crucial to successful participation in today's society. The president's office has established a web portal, www.digitalliteracy.gov, "to serve as a valuable resource to practitioners who are delivering digital literacy training and services in their communities." The website "is the destination for digital literacy resources and

collaboration. Use it to share and enhance the tools necessary to learn computer and Internet skills needed in today's global work environment" (U.S. Department of Commerce, n.d., para. 2).

Another potential barrier comes into consideration when an attraction to the Internet, its ability to offer multimedia content, is disrupted by poor device performance. Bandwidth can constrain delivery resulting in less than pleasurable (jerky, delayed, frequently paused) content consumption. Another variable to Baby Boomers/senior citizen digital device usage may be related to broadband access.

According to a 2009 study, The Impact of Broadband on Senior Citizens, regarding broadband adoption among seniors conducted by Advanced Communications Law & Policy Institute (ACLP) at New York Law School, 30% of adults over the age of 65 have broadband at home. How this has changed since 2005 is shown in Table 5. The same study indicates that seniors experience a "general lack of adequate education and training" regarding the benefits of broadband access to technology for everyday uses. However, this demographics' use has "increased more than any other age group" during the past several years (ACLP, 2009).

Table 5

Broadband Adoption Trend Change

Age Group	% Change in Broadband Adoption 2005-2008
18-29	84.2
30-49	91.7
50-64	85.5
65+	137.5

During 2008-2009, the trend continued. The senior adoption rate grew 58% and the senior mobile Internet use rate grew by 67%, outpacing all other age groups. Also noted in this study, younger seniors (Baby Boomers) are more likely to adopt broadband and mobile use than older seniors "creating a 'gray gap:' 58% of people age 55-59 have home broadband, 48% of those 60-64, 42% of those age 65-69, and 31% of those age 70-75, while 16% of those over 76 have home broadband" (Davidson & Santorelli, 2009 p. 8).

In a study of senior citizens' information technology use among those living in long-term care facilities, a number of barriers were discovered including physical and cognitive factors, hardware and software problems, individual differences, scheduling conflicts, and uncomfortable computer lab conditions (Namazi & McClintic, 2003). At that time, there were no research data available that studied senior citizens who lived independently and were computer users (Hilt & Lipschultz, 2004). In 2008, Forrester Research published a Household Technology Adoption Forecast that presented digital devices and the percentage of adoption by households among the general population. While this demographic did not segment by age, it can be extracted that because 28% of the population is comprised of Baby Boomers, their predicted adoption rates can be extrapolated (Golvin, Schadler, Fiorentino & Lo, 2008).

There are many barriers to broadband access and adoption by seniors and the ACLP research listed nine:

1. Lack of awareness or skepticism regarding the value of broadband
2. Usability concerns
    a. Computer hardware & software
    b. Online content
3. Low rate of computer ownership

4. Affordability of broadband for seniors on fixed incomes
5. Online security concerns
6. Unique living conditions
    a. Rural seniors
    b. Non-traditional living arrangements
7. Disincentives for using broadband to work past retirement
8. Lack of training and core computer competencies
9. Systemic lack of coordination among government entities regarding funding of senior-oriented training programs. (ACLP, 2009)

A survey, conducted by SeniorNet, a 25-year-old nonprofit organization serving the technology needs of seniors, found that personal frustrations, functional limitations, and time constraints were among the most significant barriers to use (Adler, 2007). Baby Boomers and younger seniors bring computer and Internet skills and experience from the workplaces forward into retirement. The new generation of seniors brings different attitudes, skills, and experiences into their retirements and social senior lives. Digital literacies and Internet access provide for social and personal growth among Baby Boomers.

Conclusion

Baby Boomers are becoming senior citizens at a rate of 7,000 to 10,000 per day and the Information Age's technological advances are leading to a digital economy. New literacies are required to participate in this new economy—literacies for efficient and effective uses of digital devices that enable participation in this new digital society. Baby Boomers as a distinct demographic have not been closely studied to determine how well they engage in this new digital society. Modeled upon the ongoing research conducted by the Pew Center's Internet & American

Life Project, this study exclusively addresses Baby Boomers digital literacies via their uses and frequencies of uses of digital devices: computers, smartphones, tablets, and e-readers. The findings present Baby Boomers digital literacies as demonstrated by the activities in which they engage, the digital device(s) they use while engaging in the activities, and the frequencies with which they engage in these activities.

Chapter 3: Methodology

Introduction

Digital technologies, digital media and digital devices are becoming ubiquitous and intrinsic in modern society and using one to interact with the others requires specific skillsets—digital/technical literacies (Lankshear & Knobel, 2006). As cell phones morph into smartphones, their capabilities exceed mere conversations; they enable instant text messaging, taking and sharing photographs, banking, shopping, and making appointments for everything from manicures to medical office visits. Kaiser Permanente® is encouraging patients to make appointments online. Banks are distributing paperless account statements, enabling electronic bill paying, and encouraging online deposits (Wells Fargo, BofA, Chase). Grocers are emailing discount coupons rather than printing them in newspapers and magazines (Safeway, Ralph's, Kroger). Families are communicating via Facebook®, Twitter® and instant messaging. Baby Boomers are becoming senior citizens at a rate of 7,000 to 10,000 per day. In order for this new crop of senior citizens to more fully interact in today's society, they must possess baseline digital literacy skills. "Technological literacy is vital to individual, community and national economic prosperity" (Weber, 1996, p. 1).

Research Question

How do older Baby Boomers (born 1946 to 1954) compare to younger Baby Boomers (born 1955 to 1964) in their digital literacies? What activities do Baby Boomers engage in using their digital devices? What digital device(s) do they use to access digital media? And, with what frequencies do Baby Boomers engage in these digital activities?

Research Population

In order to learn the extent to which Baby Boomers interact with the digital landscape prevalent today, a quantitative study was conducted by survey with a voluntary sample of a population of the Baby Boomer residents living in Shea Homes age-restricted communities (Trilogy™). There are eight age-restricted Trilogy communities in five states comprised of approximately 9,722 homes. There are approximately 17,200 Baby Boomers living in Trilogy's communities located in Arizona, California, Florida, Nevada, and Washington. A target sample size was 379 (Krejcie & Morgan, 1970). Participants were Baby Boomers defined as those individuals born between 1946 and 1964 and further designated as older boomers (1946–1954) and younger boomers (1955–1964). Participants were recruited and volunteers were sent links to an online survey. The survey was designed using questions based upon those asked by Pew for its ongoing Internet and American Life project. The survey consisted of 17 forced choice questions, and five demographic identifiers. The forced choice questions assess types of digital devices used, the purposes of uses, and frequency of uses.

Research Methodology

In order to ascertain the extent of digital literacy among a population of Baby Boomers, an online survey was chosen as the research method because it provided an instant indication that the participant possessed some unknown extent of digital literacy as evidenced by their possession of an email address. However, it left open questions as to the extent of digital literacy possessed by the participants. Do they engage in digital activities beyond sending and receiving email? If so, what activities, using what devices, and with what frequencies? The online survey method was selected because it was an inexpensive method for recruiting participants from a population of more than 8,000 households and it allowed for the use of online survey technology.

The sample of 659 volunteer participants was sent link to a survey of 17 forced choice questions. The individuals were solicited from a population of 8,223 Baby Boomers households located in age-restricted, resort communities. Contact information was provided by Shea Homes™ IT Department. Participants were recruited via email and the survey was conducted using SurveyMonkey.com which hosts web-based surveys. An example of the survey is located in Appendix A.

Quantitative analyses were conducted. Frequency distributions were run for each question, summary statistics were computed, various cross-tabs created, and Chi-square analyses were conducted.

Unit of Analysis

The unit of analysis is the individual.

Data gathering Instrument

Pew Center's Internet and American Life project first focused on two research areas: (a) monitoring basic online activities (who was using the Internet and what were they doing) and (b) researching several dimensions of social life not much studied elsewhere (how was people's use affecting families, communities, health care, educational pursuits, civic and political life, and workplace activities). During its twelve years of operation, the project's purview has expanded to include various Internet-related activities. It has crafted thousands of questions and surveyed thousands of participants. Its research points are many (e.g. online privacy, broadband users, wireless connectivity, video games, online banking, spam, blogging, online dating, visiting social network sites, looking up directions and recipes, and checking the weather forecast), and its demographics are broad (e.g. ethnicity, age, education, income level, community type). Pew intentionally casts a wide net for sampling the general population. This research utilized

questions based upon those of the Pew Center's Internet and American Life project and focused on a specific population: Baby Boomers living in age-restricted communities of single-family homes.

The research was conducted as a survey of a population of Baby Boomers who volunteered to participate. Requests for volunteer participation were sent to each home with an email address. The volunteer request included an Informed Consent form and a link to the survey instrument. In this way, those willing to participate could read/acknowledge the Informed Consent, click the link to the survey and proceed to the survey. It should be noted that there is an overlying assumption the research population is familiar with email based on the fact that the home owner registered at least one email address with the community resident directory. The results of the survey compared the activities in which participants engaged, the devices they used while engaging in those activities, and the frequency with which they engaged in those activities and compared these behaviors of older Baby Boomers to younger Baby Boomers.

The instrument used was compiled from survey questions developed by the staff at Pew Research and were based upon a hierarchy of activities ranked from Pew. A few of the questions were selected related specifically to use of digital technologies. The purpose of the research of those activities was to determine what activities were engaged in most frequently by respondents. The use of these questions was formally approved by Pew for use in this research. A copy of the approval communication is attached in Appendix B.

Trend Data from Pew's "Usage Over Time" (Pew Research Center, 2012) were used to generate a hierarchy of Internet activities resulting in the questions used for gauging the engagement in digital activities of this study's participants. Pew researchers asked survey participants if they engaged in any of 130 online activities. This research used 17 of those

activities as the basis for the 17 questions in this research. Although more activities could have been added to the survey, the committee requested a brief and focused survey. The activities selected related to the Baby Boomer population in specific.

The instrument consisted of 17 forced choice questions regarding specific uses, frequency of uses, and the type(s) of digital devices used. (For example: Do you send email? Do you do your banking online? Do you search for medical information online? Do you shop online? Do you check your medical records online? Do you send instant messages? Do you search for directions online? Do you participate in social networks on line? Do you watch TV or movies online? Do you check weather online? Do you read or write blogs? Do you save bookmarks?) Further, the questions asked respondents to indicate the digital device used while engaged in the specific activity (desktop PC, laptop PC, netbook, tablet, cellphone, or smartphone) and the frequency of the activity (daily, weekly, bi-monthly, monthly, less than monthly).

Recruiting Participants

Working in cooperation with the Shea's Trilogy, email requests for participants were sent to registered email addresses in all eight Trilogy age-restricted communities. The request included an incentive: each community would be provided a $100.00 gift card to be given away to a randomly chosen survey participant from that community. The same email included an Informed Consent form and a link to the survey. The instrument was administered during July, 2013.

IRB Approval

The study was submitted to and approved by IRB. A copy of the IRB approval communication is included in Appendix C.

Data Analysis

The survey was taken by 659 voluntary participants. The questionnaires were collected, reviewed, coded, and cleaned. Fifty-two of the surveys were eliminated due to participants indicating that their birthdates were outside the range of Baby Boomer parameters (1946–1964).

The data described the technology-based activities in which Baby Boomers engaged, the devices they used for that engagement, and the frequency with which they partook in these digital activities. It enabled computation of the degree of digital literacy professed by similar populations of Baby Boomers. The data were further divided into two groups: older Boomers (those born between 1946 and 1955) and younger Boomers (those born between 1956 and 1964) and their technology-based (digital literacy) skills were compared.

Summary

Beginning in 2011, the first of an estimated 79 million Baby Boomers began becoming senior citizens at a rate of nearly 10,000 per day and senior citizens are stereotypically described as being technophobes. Digital media and digital devices have become ubiquitous in today's world and digital literacy has been described as a necessary skill for digital age survival. This study surveys the digital literacies and skills of a population of Baby Boomers comparing older Baby Boomers to younger Baby Boomers. The results will demonstrate the extent to which Baby Boomers are digitally literate and capable of active, successful, fulfilling participation in today's digital world.

Chapter 4: Results

The purpose of this study was to understand the extent to which Baby Boomers are digitally literate. The research questions that guided the survey were: What activities do Baby Boomers engage in using their digital devices? What digital device(s) do they use to access digital media? And, with what frequencies do Baby Boomers engage in these digital activities? Additionally, the research intended to compare older Baby Boomers (born 1946 to 1954) to younger Baby Boomers (born 1955 to 1964) in their overall digital literacies?

A volunteer population of Baby Boomers was recruited via email and volunteer participants were surveyed. The survey asked: (a) whether or not the Baby Boomers engaged in specific digital activities; (b) the digital device(s) the Baby Boomers use while engaging in these activities; and (c) the frequency with which the Baby Boomers engage in those activities. The data gathered by this study compared the responses of Older Boomers (born 1946 through 1954) to Younger Boomers (born 1965 to 1964) to determine if there are digital literacy differences between the two Baby Boomer groups. The study utilized survey questions from research instruments used during the ongoing Pew Center's Internet & American Life Project. The questions were chosen from a Pew list of the most frequent digital activities engaged in by the general population (Pew Research Center, 2012).

Participants were recruited from eight, age-restricted communities (55 years of age and older), developed by a nationally recognized homebuilder, Shea™. The communities, known as Trilogy—Active Lifestyle Communities are located in five states (Washington, California, Nevada, Arizona, and Florida) and were selected due to their age-restricted population of Baby Boomers and senior citizens. As an incentive to encourage participation, a $100.00 gift card was provided to each community and a drawing held to reward one survey participant in each

community. The gift card was awarded by random drawing from a coded list of survey participants. The list was generated by SurveyMonkey™, the online research tool used for the study and the drawing and reward was coordinated by a representative of Shea. The researcher was not directly involved with the list of participants in any way.

Of the roughly 12,000 Trilogy home owner/residents, more than 8,000 requests for participation were emailed to members of the Trilogy communities who registered their email addresses with Trilogy community directories. Those without email addresses were excluded from this study due to the burden of excessive expense. Additional costs would have been generated by mailing nearly 4,000 Letters of Request, Informed Consent forms, Survey Instruments, and prepaid return mailers (USPS). Manual data collections and entry, cleaning, and coding of surveys would have generated other expenses.

Included with each emailed request-to-participate was an Informed Consent form and a link to the survey instrument. More than eight percent of those contacted responded favorably: 659 Trilogy community members agreed to participate. The survey instrument was made available using SurveyMonkey™. The data collected were cleaned by eliminating any surveys that were completed by persons other than Baby Boomers as defined by birthdate range (1946-1964). There remained 607 viable survey responses. The data were then coded replacing non-numerical values with numerical values. SPSS was used to perform data calculations and two-by-two Chi Square analysis was run on each response. In all instances, Chi Square compared Older Boomers (OB) to Younger Boomers (YB) in each activity, devices used for each activity and, frequency of engagement in each activity. Demographic information was collected at the end of each survey and incorporated into the study to further compare participation by age, gender, education, and income.

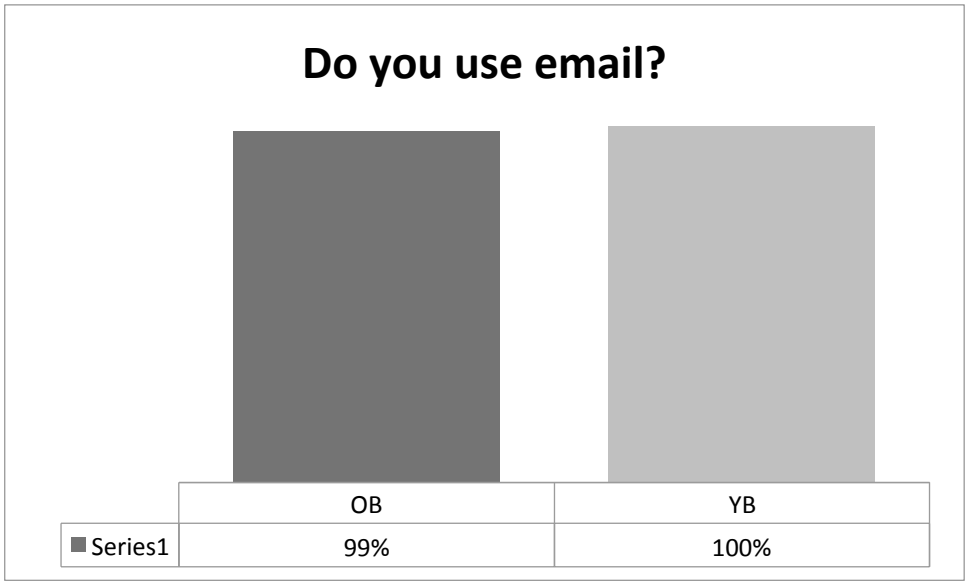
The survey was guided by the research questions: What activities do Baby Boomers engage in using their digital devices? What digital device(s) do they use to access digital media? And, with what frequencies do Baby Boomers engage in these digital activities? The survey consisted of the 17 questions. Each question was presented in three parts:

1. Do you ____?
2. If yes, using what device(s)?
3. If you do ___, how frequently?

Survey responses are presented below along with the demographic identifier results. The data are presented in the same sequence as the survey itself. The responses to each question are presented in comparison of Older Boomer (OB) compared to Younger Boomer (YB). An example of the survey instrument is included in Appendix A. The survey raw data are included in Appendix D. The complete X^2 data are included in Appendix E.

The Survey Questions and Responses

1. Do you send and receive email?

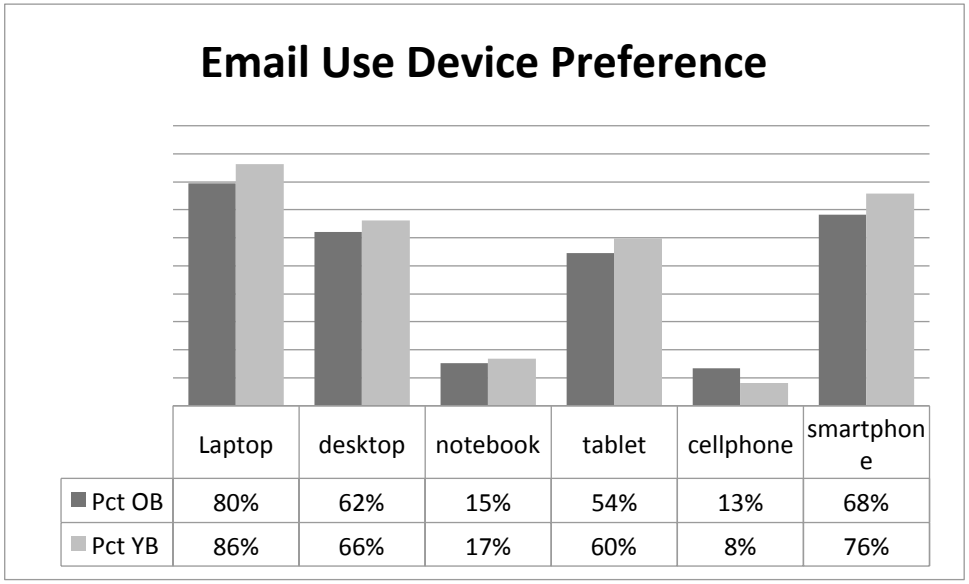


N=604; OB=480, YB=123

Figure 2. Do you use email?

A total of 99% of the Older Boomer survey respondents use email while 100% of the Younger Boomer respondents do.

If you send and receive email, which device(s) do you use? Check all that apply.



	Laptop	desktop	notebook	tablet	cellphone	smartphone
Pct OB	80%	62%	15%	54%	13%	68%
Pct YB	86%	66%	17%	60%	8%	76%

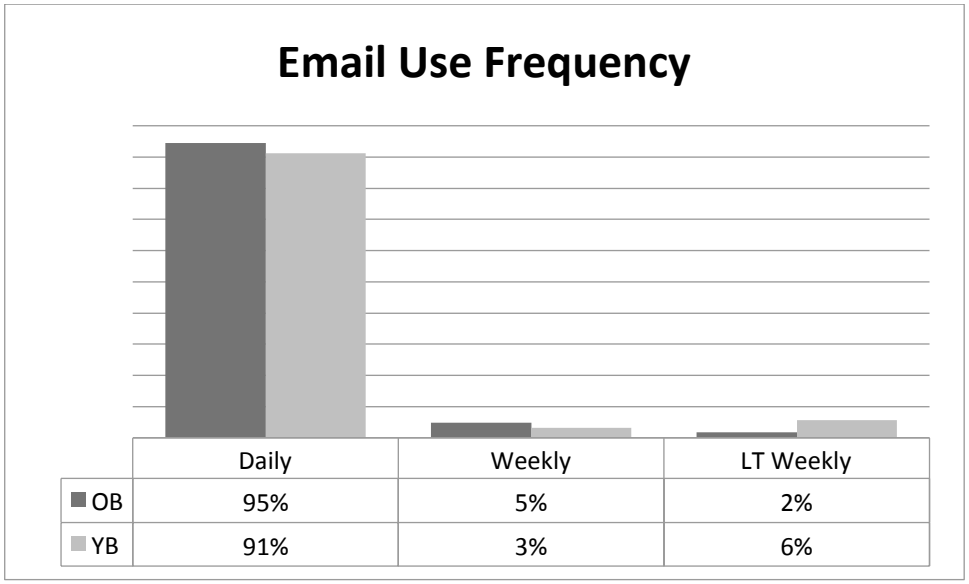
N=601; OB=477, YB=124

Figure 3. Email use device preference.

There were 604 survey respondents of which 601 answered this question.

When using email, 80% of the Older Boomers use laptop computers while 86% of the Younger Boomers do so. When using email, 62% of the Older Boomers use desktop computers while 60% of the Younger Boomers do so. When using email, 15% of the Older Boomers use notebook computers while 17% of the Younger Boomers do so. When using email, 54% of the Older Boomers use tablet computers while 60% of the Younger Boomers do so. When using email, 13% of the Older Boomers use cell phones while 8% of the Younger Boomers do so and 68% of the Older Boomers use smartphones while 70% of the Younger Boomers do so.

If you send and recceive email, how frequently?



N=601; OB=477, YB=124

Figure 4. Email use frequency.

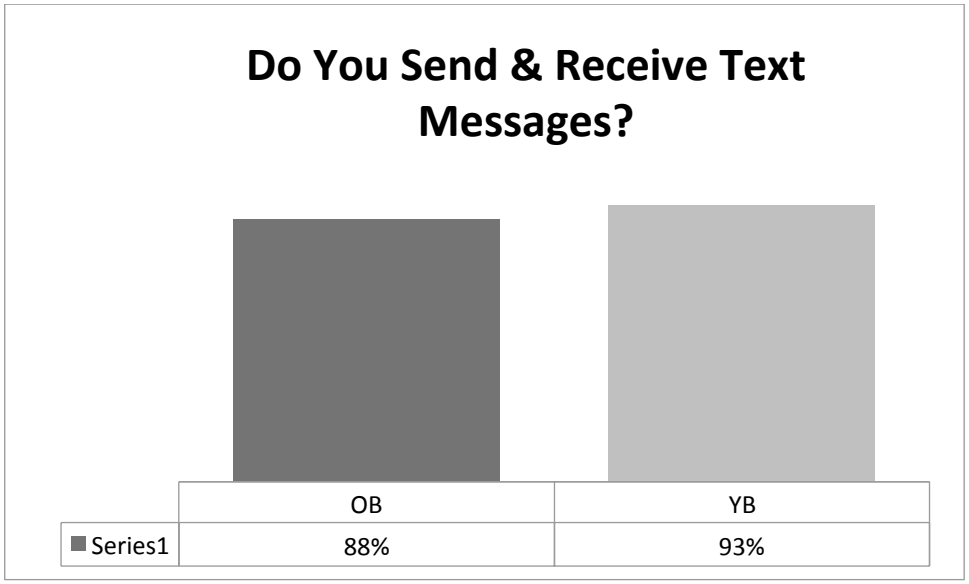
As seen in Table 6, Baby Boomers email frequency is significant. When asked to describe the frequency with which they use email, 95% of the Older Boomers reported daily email use and 91% of the Younger Boomers do so. Five percent of the Older Boomers use email weekly and 3% of the Younger Boomers do so. Only 2% of the Older Boomers use email less than weekly and 6% of the Younger Boomers do so.

Table 6

Email Use Frequency

	X2	Sig.
Email frequency	6.92	.031

2. Do you send and receive text messages?

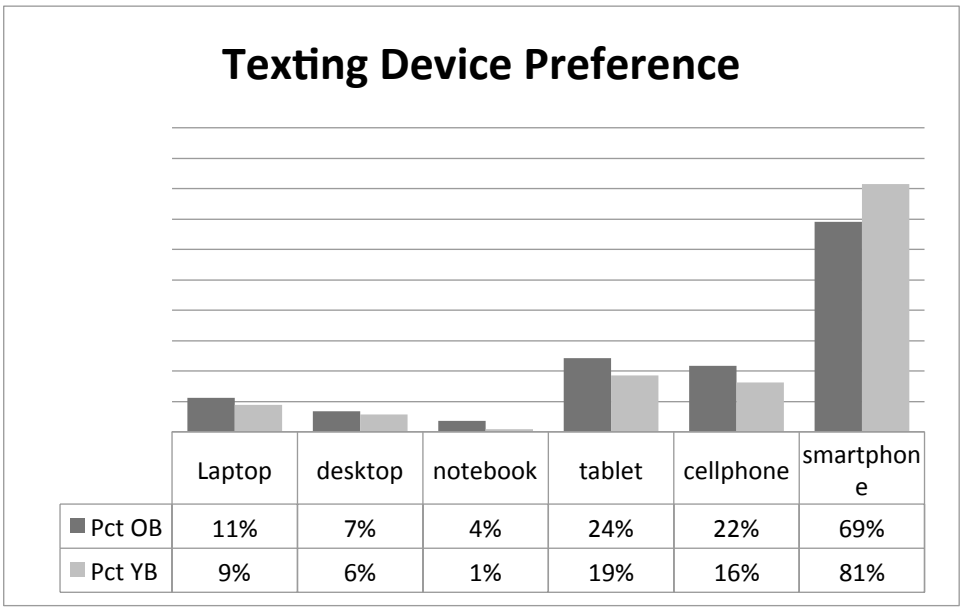


N=604; OB=480, YB=124

Figure 5. Do you send and receive text messages?

When asked about text messaging, 88% of the Older Boomers indicated they text message and 93% of the Younger Boomers reported doing so.

If you send and receive text messages, which device(s) do you use? Check all that apply.



N=540; OB=425, YB=115

Figure 6. Texting device preference.

There were 604 respondents to this question of which 540 responded affirmatively.

As seen in Table 7, Baby Boomers texting using smartphones is significant. Asked about the device(s) they used to text, 69% of the Older Boomers reported using smartphones and 81% of the Younger Boomers reported doing so with smartphones. Older Boomers used cellphones and tablet computers 22% and 24% respectively while Younger Boomers reported using cellphones and tablet computers 16% and 19% respectively.

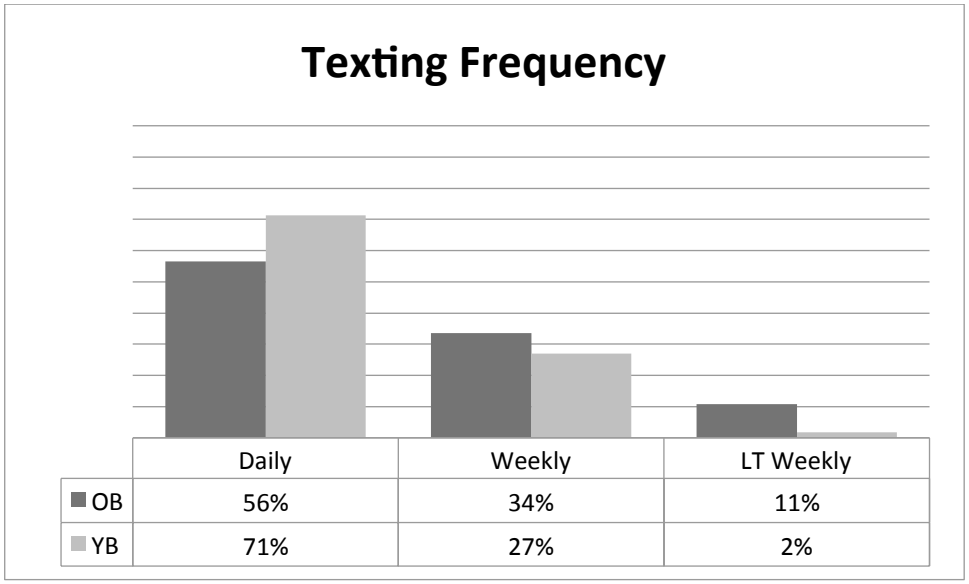
Table 7

Text Device Preference

	X^2	Sig.
Text using smartphone	5.37	.02

It is interesting that Younger Boomers use smartphones to text while Older Boomers use tablets and cellphones to do so.

If you send and receive text messages, how frequently?



N=540; OB=425, YB=115

Figure 7. Texting device frequency.

As seen in Table 8, texting frequency is significant. Fifty-six percent of Older Boomers reported daily texting while 71% of Younger Boomers do so. Thirty-four percent of Older Boomers indicated weekly texting and 11% indicated texting less than weekly. Twenty-seven percent of Younger Baby Boomers send and receive text messages weekly and 2% send and receive text messages less than weekly.

Table 8

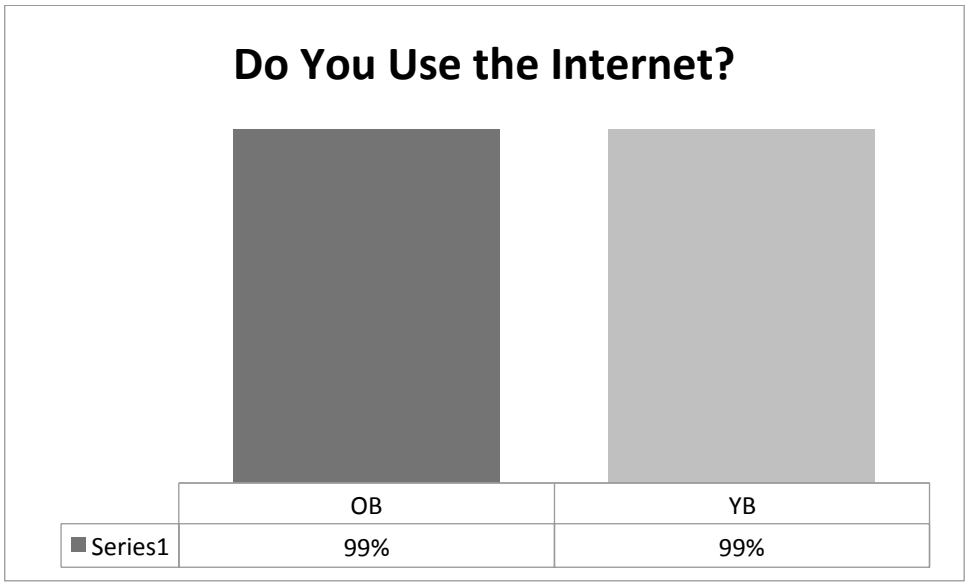
Texting Frequency

	X^2	Sig
Text Frequency	12.90	.00

An interesting correlation can be drawn between email use and frequency thereof and texting and texting frequency between Older Boomers and Younger Boomers: Older Boomers use email more frequently and Younger Boomers text more frequently. This brings into question whether or not Older Boomers are more comfortable with (traditional) email than they are

texting and if Younger Boomers are more comfortable with the newer communication method of texting.

3. Do you use the Internet?

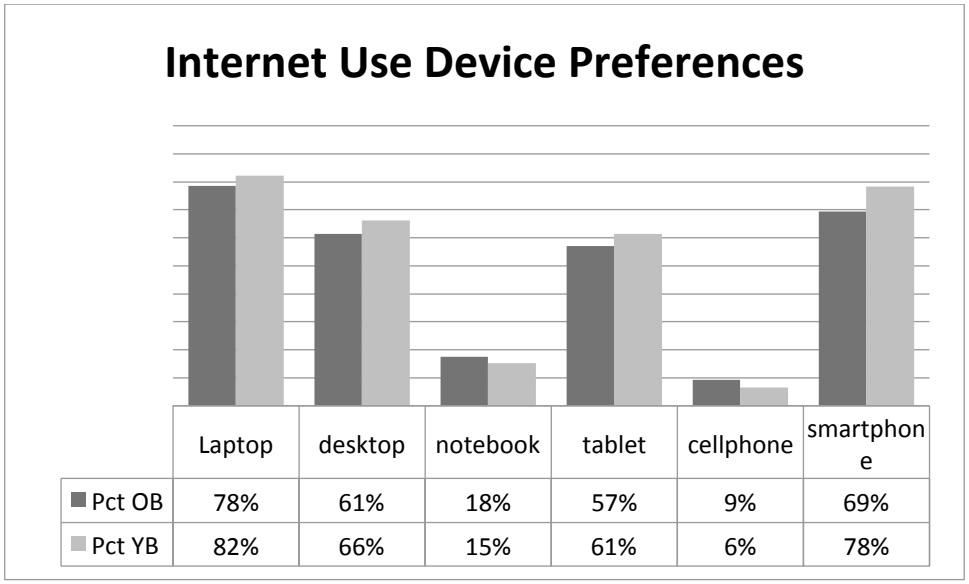


N=603; OB=480, YB=123

Figure 8. Do you use the Internet?

Only 1% of Baby Boomers do not use the Internet. Ninety-nine percent of both Older Boomers and Younger Boomers reported using the Internet.

If you use the Internet, which device(s) do you use? Check all that apply.



	Laptop	desktop	notebook	tablet	cellphone	smartphone
Pct OB	78%	61%	18%	57%	9%	69%
Pct YB	82%	66%	15%	61%	6%	78%

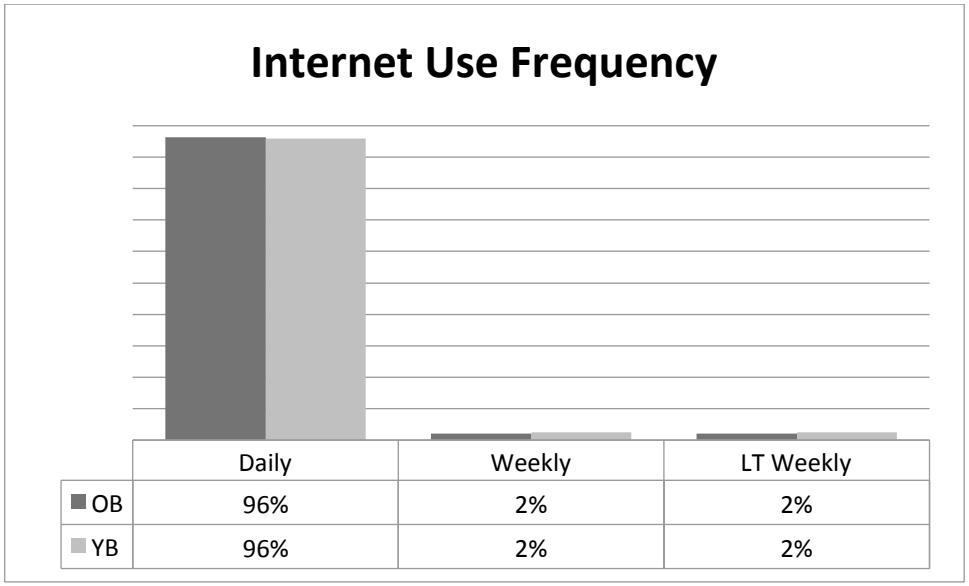
N=603; OB=480, YB=123

Figure 9. Internet use device preference.

There were 604 respondents to this question of which 603 responded affirmatively.

Older Boomers use laptop computers, smartphones, desktop computers and tablet computers 78%, 69%, 61% and 57% respectively to access the Internet while Younger Boomers use the same devices 82%, 78%, 66% and 61% of the time. Notebooks and cellphones are the least used devices between both groups of Baby Boomers with Older Boomers reporting 18% use notebooks and 9% use cellphones and Younger Baby Boomers reporting 15% and 6% respectively.

If you use the Internet, how frequently?

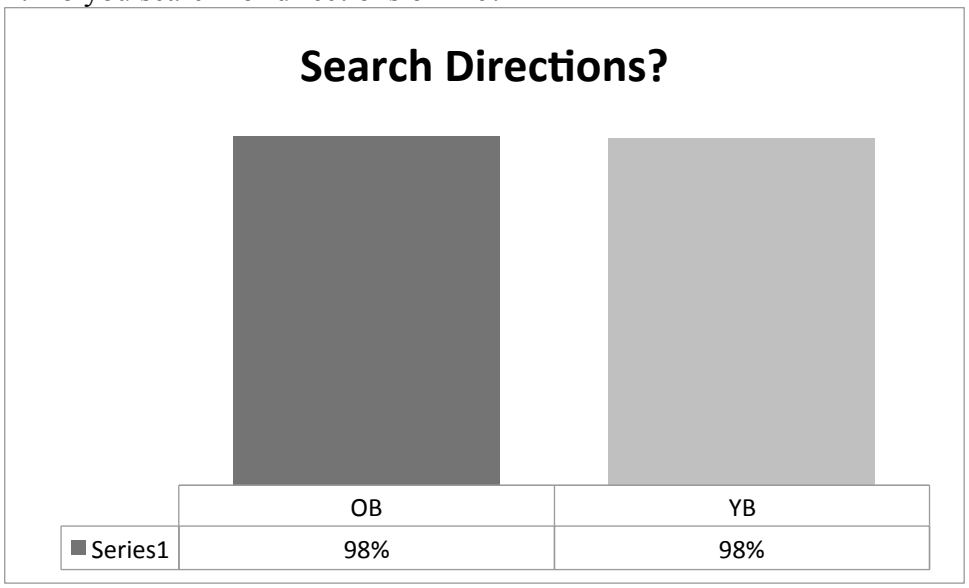


N=603; OB=480, YB=123

Figure 10. Internet use frequency.

Older Boomers and Younger Boomers reported identical frequencies for using the Internet: 96% use it daily while 2% use it weekly and 2% use it less than weekly.

4. Do you search for directions online?

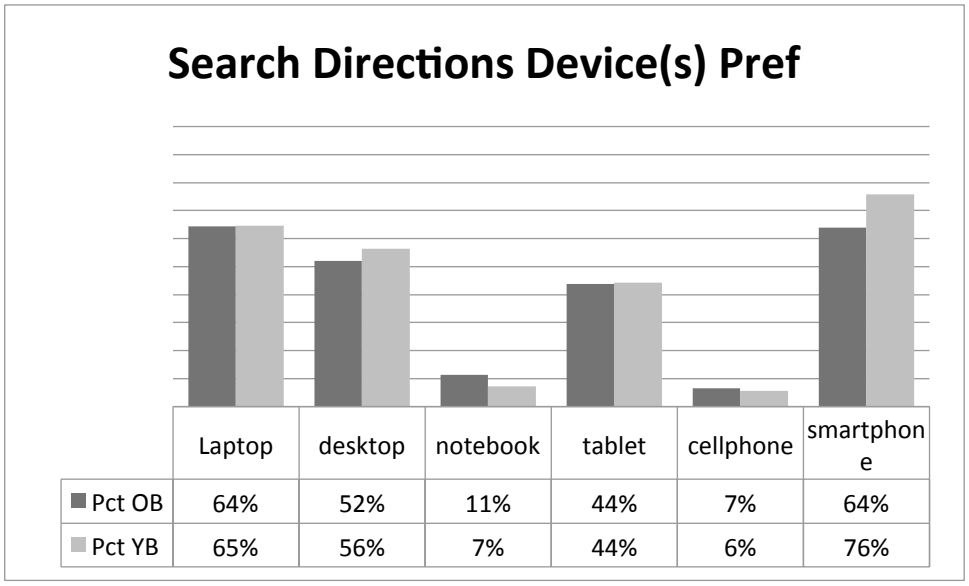


N=607; OB=483, YB=124

Figure 11. Do you search directions online?

There were 604 respondents to this question of which 595 responded affirmatively. The number of Older Boomers and Younger Boomers that search for directions online is identical at 98%.

If you search for directions online, which device(s) do you use? Check all that apply.



	Laptop	desktop	notebook	tablet	cellphone	smartphone
Pct OB	64%	52%	11%	44%	7%	64%
Pct YB	65%	56%	7%	44%	6%	76%

N=595; OB=474, YB=121

Figure 12. Search for directions online device preferences.

There were 604 respondents to this question of which 595 responded affirmatively.

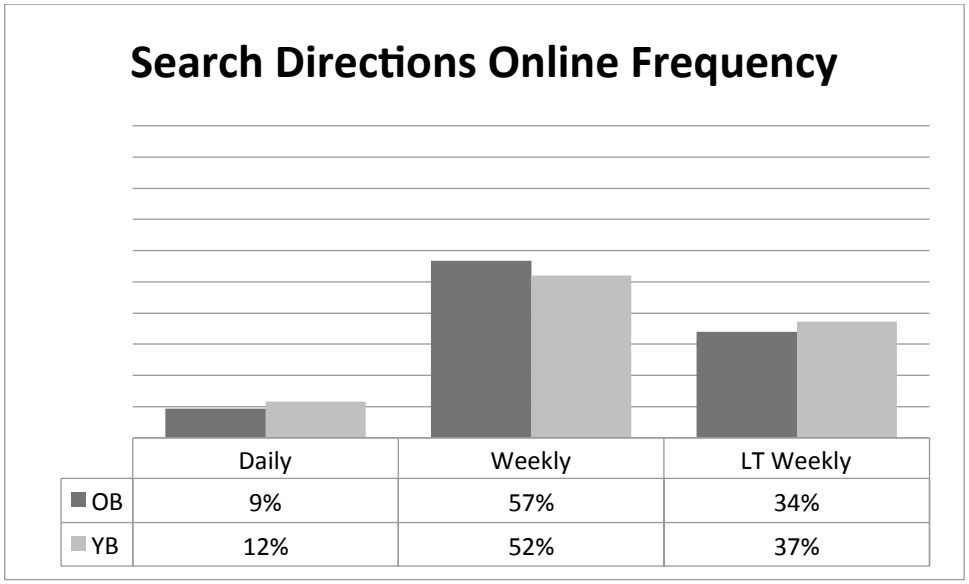
The devices used by Older Boomers to search the Internet looking for directions are laptop computers (64%), smartphones (64%), desktop computers (52%) and tablet computers (44%) while Younger Boomers use the same devices in slightly different numbers: smartphones (76%), computers (65%), desktop computers (56%), and tablets (44%). As seen in Table 9, based upon $X^{2,}$ there appears to be a relationship between Boomers looking for directions online and the use of their smartphone.

Table 9

Get Directions Device Preference

	X^2	Sig.
Get Directions using smartphone	5.99	.01

If you search for directions online, how frequently?

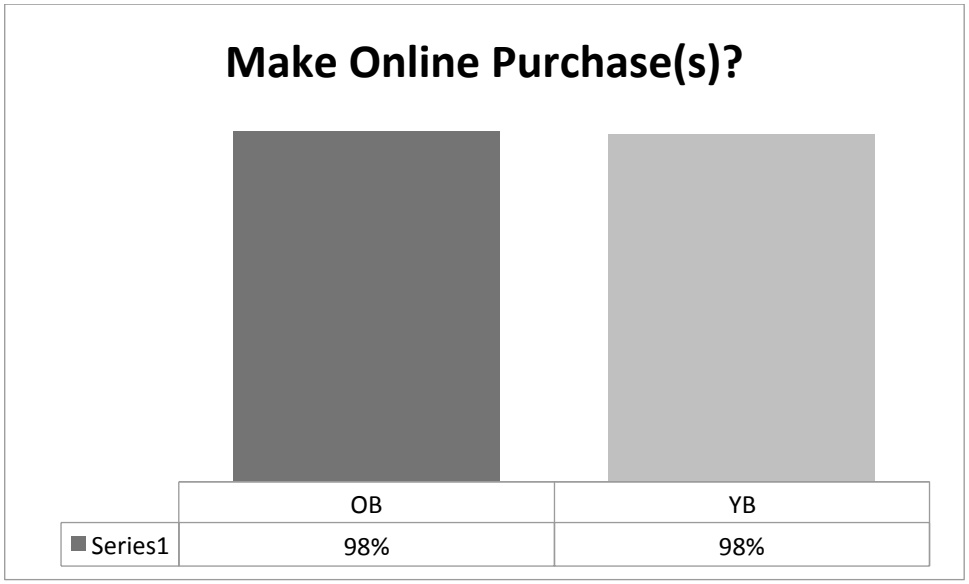


N=595; OB=474, YB=121

Figure 13. Search for directions online frequency.

Fifty-seven percent of Older Boomers search online for directions weekly and 52% of Younger Boomers do so. Thirty-four percent of Older Boomers search online for directions less than weekly and 37% of Younger Boomers do so and 9% of Older Boomers search online for directions daily while 12% of Younger Boomers do so.

5. Do you make online purchases?

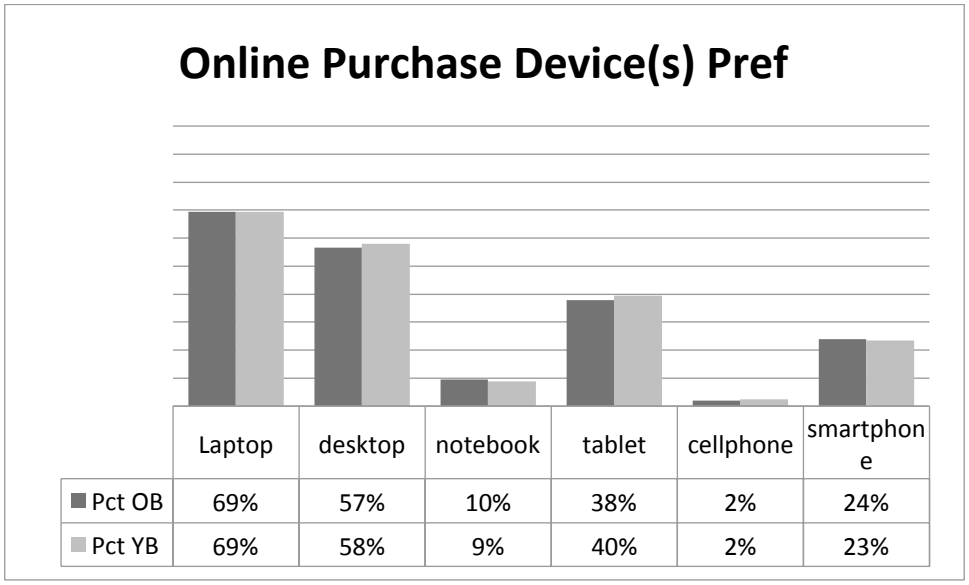


N=607; OB=483, YB=124

Figure 14. Do you make online purchases?

Both Older Boomers and Younger Boomers report making online purchases with 98% of respondents indicating that they do.

If you make online purchases, which device(s) do you use? Check all tht apply.



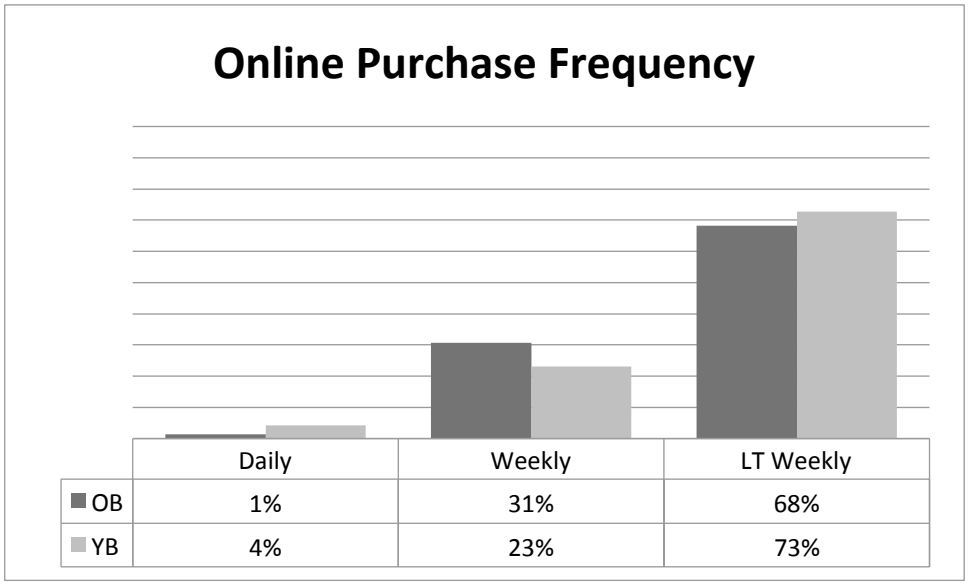
N=596; OB=475, YB=121

Figure 15. Online purchase device preference.

Of the 602 respondents to this question, 596 responded affirmatively.

Responding to the question regarding device(s) used to make online purchases, Older Boomers reported using laptop computers, desktop computers, tablet computers, and smartphones at 69%, 57%, 38%, and 24% respectively and Younger Boomers reported the same devices at 69%, 58%, 40%, and 23% respectively. Based upon X^2, there appears to be a relationship among Boomers making online purchases and their device(s) of preference for that activity. Boomers are most likely to use their laptops, smartphones, or notebooks while shopping online.

If you make online purchases, how frequently?



N=596; OB=475, YB=121

Figure 16. Online purchase frequency.

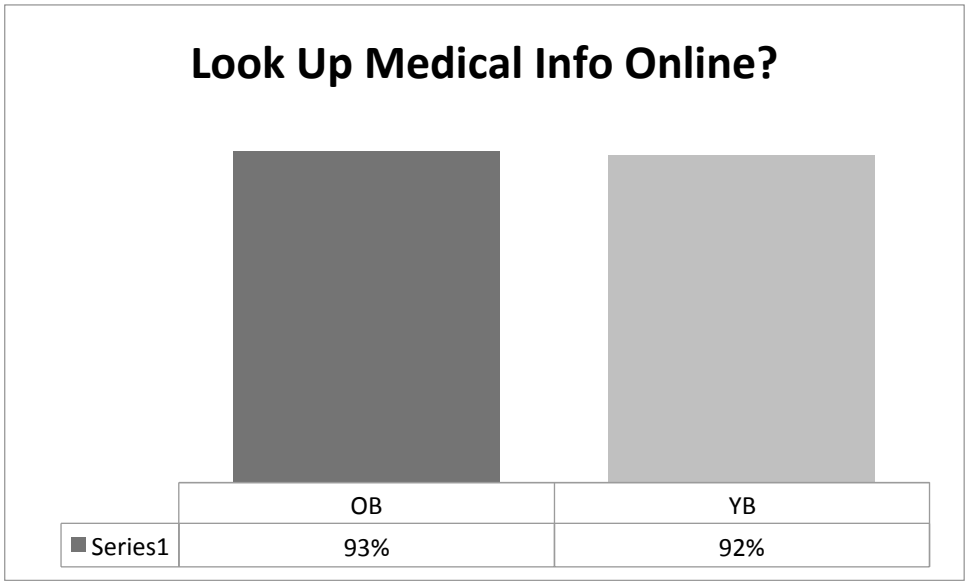
As seen in Table 10, online purchasing frequency is significant. Sixty-eight percent of the Older Boomers reported making online purchases less than weekly and 73% of the Younger Boomers reported doing so at this frequency. Thirty-one percent of the Older Boomers reported weekly online purchases and 23% of the Younger Boomers do so and 1% of Older Boomers reported daily online purchases while 4% of Younger Boomers do so on a daily basis.

Table 10

Online Purchase Frequency

	X2	Sig.
Online purchase frequency?	6.52	.04

6. Do you look up medical or health information online?

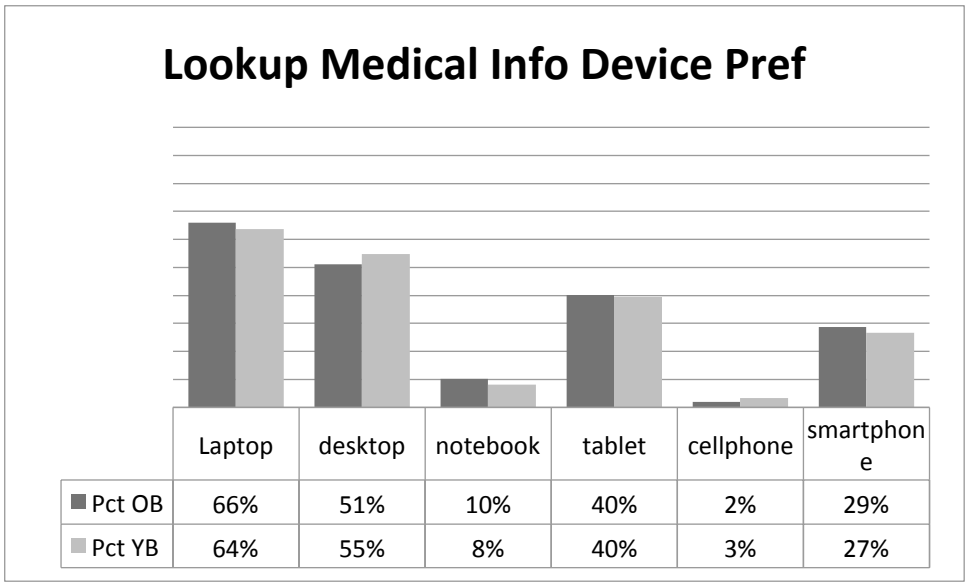


N=604; OB=483, YB=124

Figure 17. Do you look up medical information online?

Ninety-three percent of Older Boomers reported looking up medical information online while 92% of Younger Boomers reported doing so. Based upon X^2, Boomers are likely to look up medical information online.

If you look up medical or health information online, which device(s) do you use? Check all that apply.



	Laptop	desktop	notebook	tablet	cellphone	smartphone
Pct OB	66%	51%	10%	40%	2%	29%
Pct YB	64%	55%	8%	40%	3%	27%

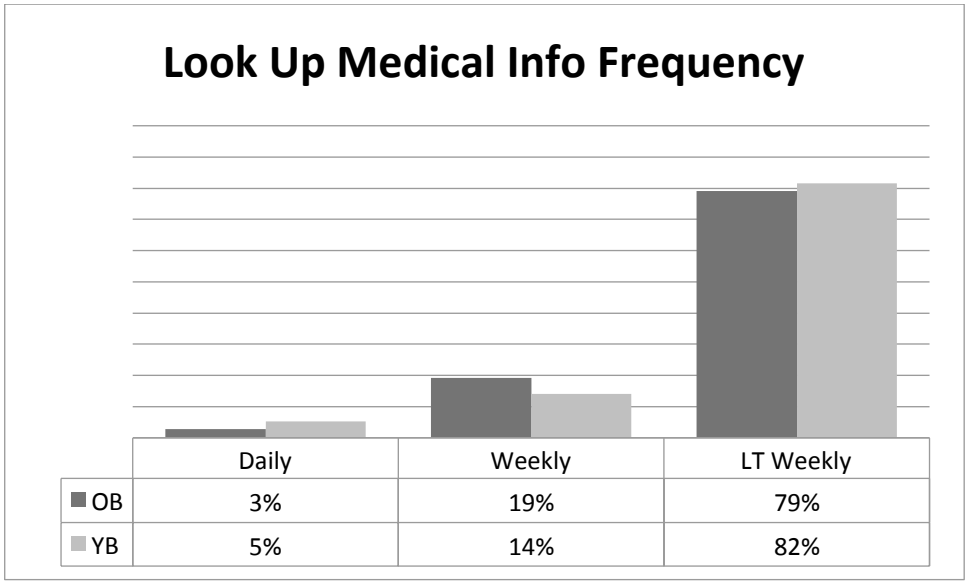
N=564; OB=450, YB=114

Figure 18. Medical information lookup device preference.

Of the 604 respondents to this question, 564 responded affirmatively.

Sixty-six percent of Older Boomers reported using laptop computers, 51% reported using desktop computers, 40% reported using tablets, and 29% reported using smartphones to look up medical information online. Sixty-four percent of Younger Boomers reported using laptop computers to look up medical information online, 55% reported using desktop computers, 40% used tablets and 27% reported using smartphones. Based upon X^2, when looking up medical information online, most Boomers are likely to use a tablet device.

If you look up medical or health information online, how frequently?

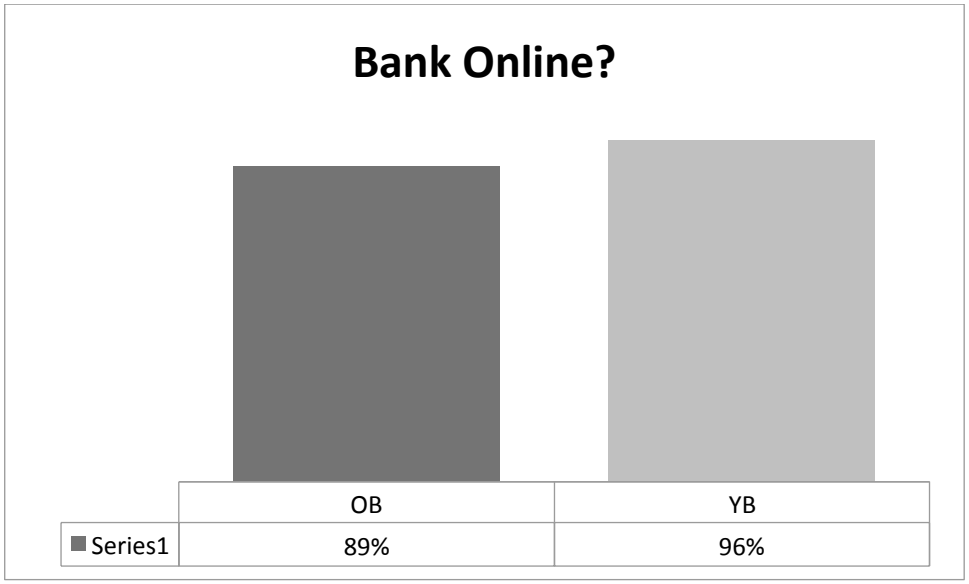


N=564; OB=450. YB=114

Figure 19. Medical information lookup frequency.

Seventy-nine percent of Older Boomers reported looking up medical information on a less than weekly frequency and 82% of Younger Boomers reported doing so at that rate. Nineteen percent of Older Boomers reported looking up medical information on a weekly basis while 14% of Younger Boomers do so and 3% of Older Boomers and 5% of Younger Boomers reported looking up medical information on a daily basis.

7. Do you bank online?

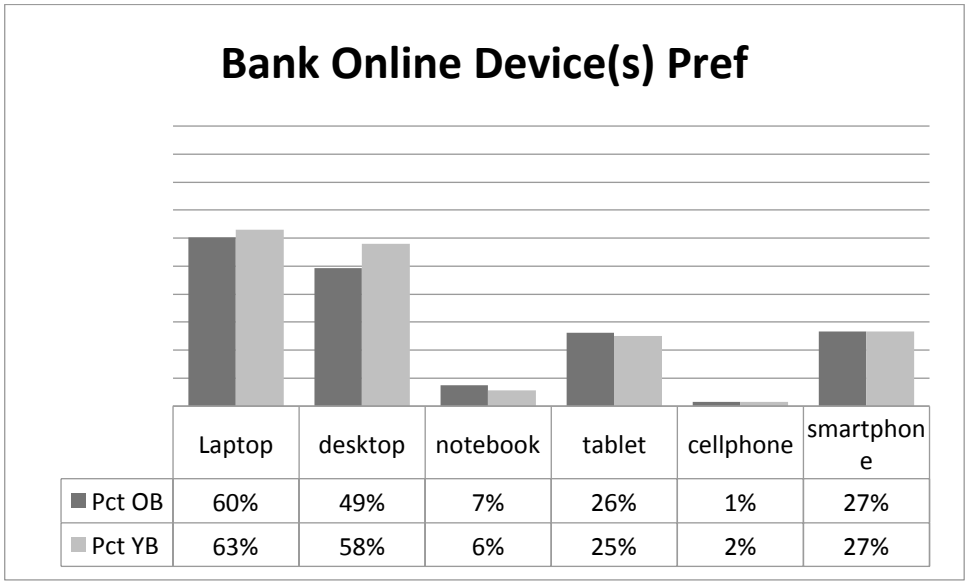


N=605; OB=483, YB=124)

Figure 20. Do you bank online?

Eighty-nine percent of Older Boomers and 96% of Younger Boomers reported banking online.

If you bank online, which device(s) do you use?



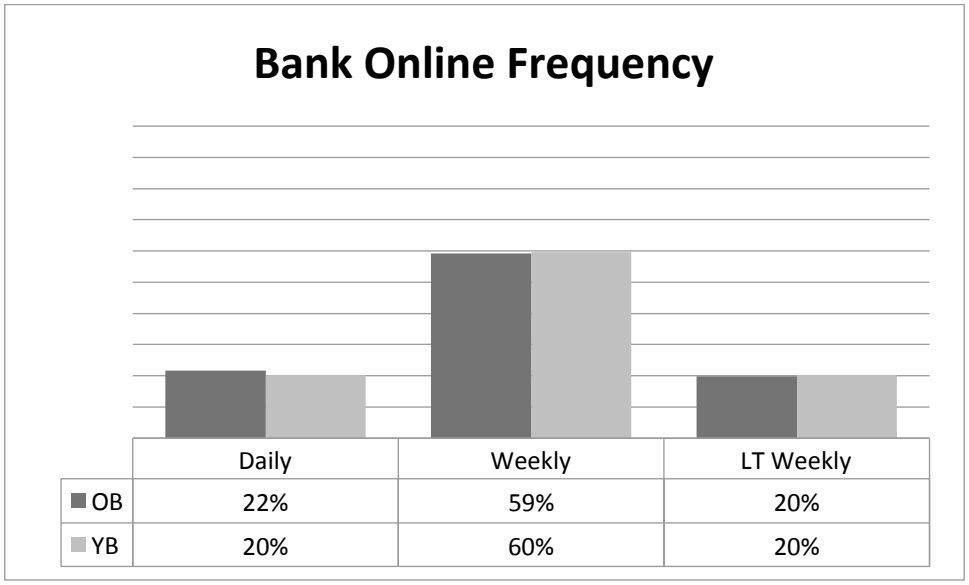
N=547; OB=428, Y=119

Figure 21. Bank online device preference.

When banking online, Older Boomers use laptop computers, desktop computers, smartphones, and tablets 60%, 49%, 27% and 26% respectively and Younger Boomers use laptop computers, desktop computers, smartphones, and tablets 63%, 58%, 27% and 25% of the time.

Of the 605 respondents to this question, 547 responded affirmatively and, based upon X^2, most Boomers are likely to use a cellphone when banking online.

If you bank online, how frequently?

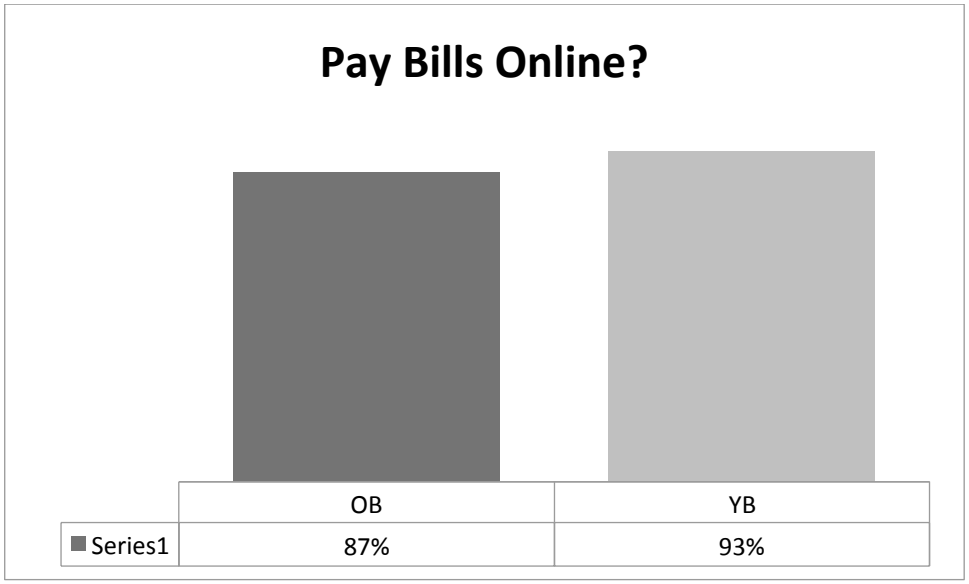


N=547; OB=428, YB=119

Figure 22. Bank online frequency.

Asked how frequently they bank online, 59% of Older Boomers reported weekly banking, 22% daily banking and 20% less than weekly and 60% of Younger Boomers reported daily banking and 20% reported weekly and 20% reported less than weekly online banking. Based upon X^2, Boomers who bank online are likely to do so weekly.

8. Do you pay bills online?

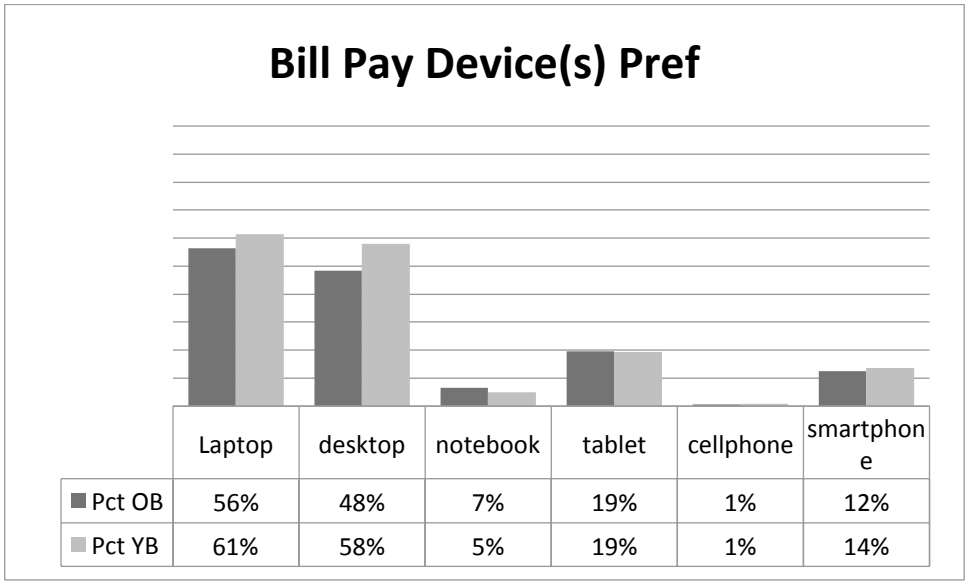


N=607; OB=483, YB=124

Figure 23. Do you pay bills online?

Asked about online bill paying, 87% of Older Boomers indicated they do pay bills online and 93% of Younger Boomers do so.

If you pay bills online, which device(s) do you use? Check all that apply.



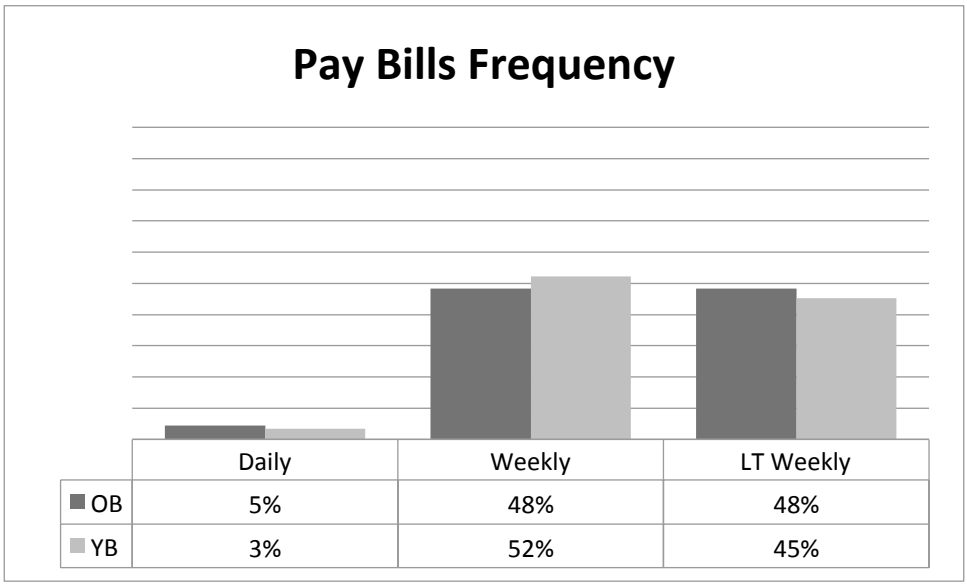
N=535; OB=420, YB=115

Figure 24. Online bill pay device preference.

There were 600 respondents to this question, 535 responded affirmatively.

Fifty-six percent of Older Boomers indicated that they pay bills online using laptop computers, 48% using desktop computers, 19% using tablets and 12% using smartphones. Sixty-one percent of Younger Boomers reported using laptop computers to pay bills online, 58% use desktop computers, 19% use tablets, and 14% use smartphones. Based upon X^2, Boomers who pay bills online are more likely to use a smartphone or cellphone than other digital device.

If you pay bills online, how frequently?

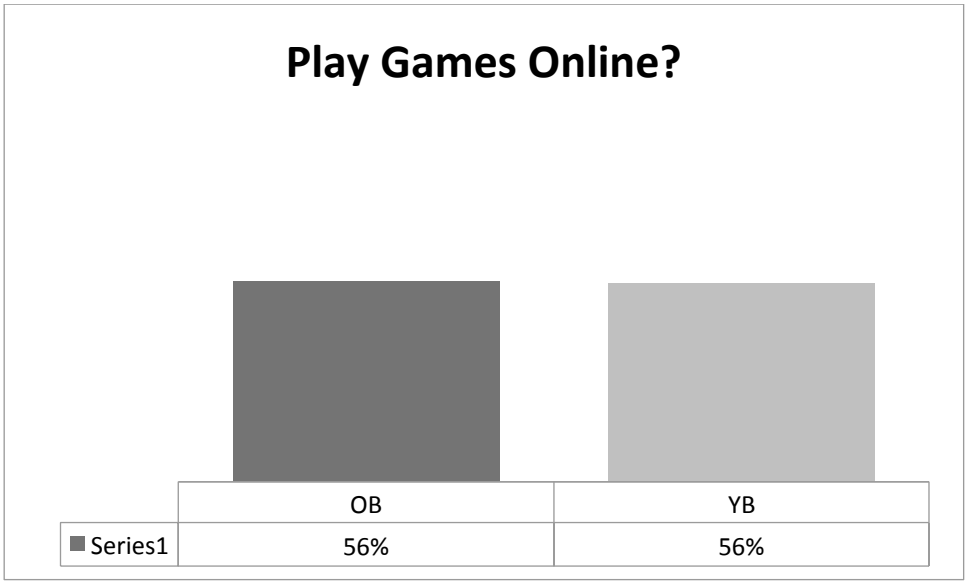


N=535; OB=420, YB=115

Figure 25. Online bill pay frequency.

Asked the frequency with which they pay bills online, 48% of Older Boomers do so weekly and less than weekly. Five percent of Older Boomers pay bills online daily. Fifty-two percent of Younger Boomers pay bills online weekly, 45% pay them less than weekly and 3% pay them daily.

9. Do you play games online?

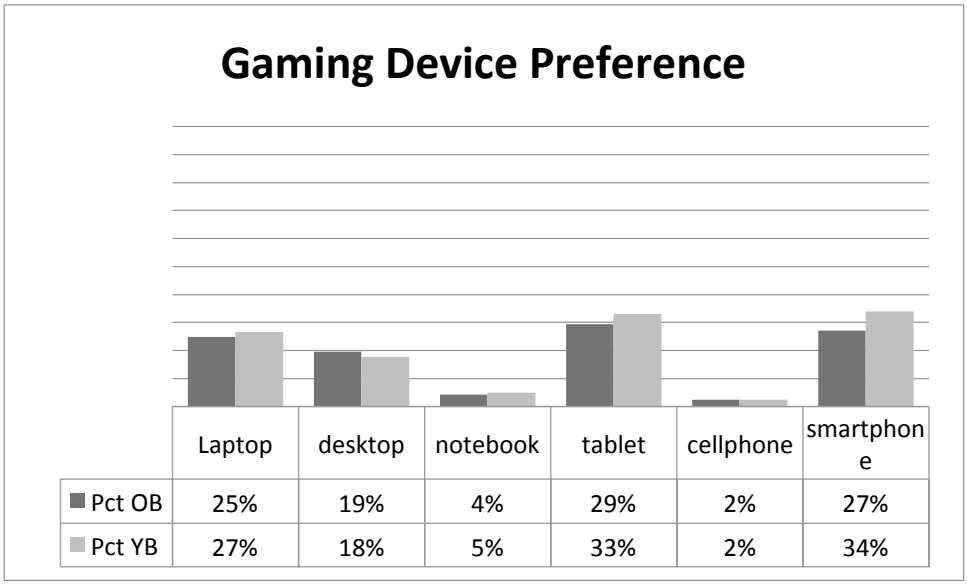


N=607; OB=483, YB=124

Figure 26. Play games online?

Fifty-six percent of both Older Boomers and Younger reported playing games online.

If you play games online, which device(s) do you use? Check all that apply.



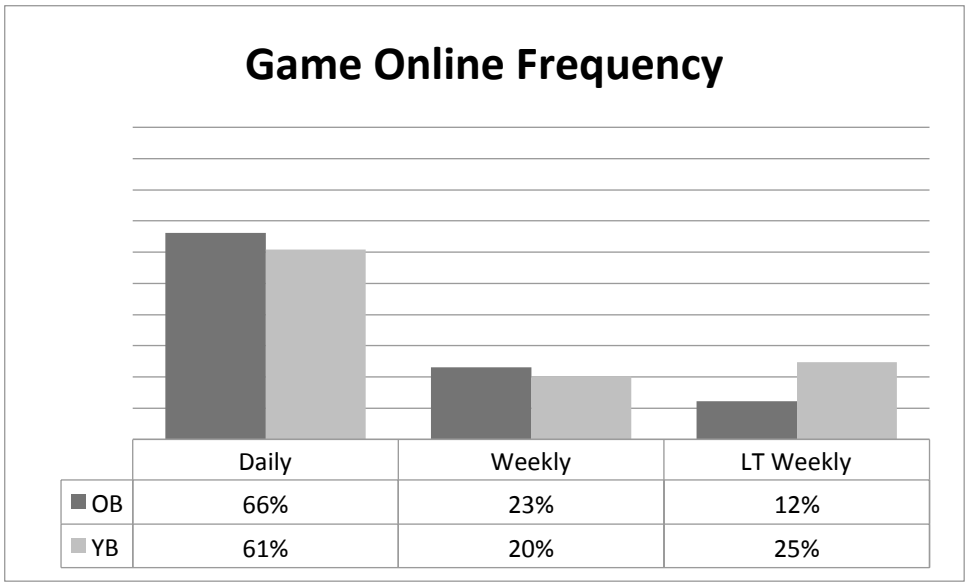
N=341; OB=272, YB=69

Figure 27. Online gaming device preference.

There were 606 respondents to this question, 341 responded affirmatively.

Twenty-nine percent of Older Boomers who play games online use tablet computers and 27% use smartphones while 25% use laptop computers and 19% use desktop computers. Thirty-four percent of Younger Boomers play games online using smartphones, 33% using tablets, 27% using laptops, and 18% using desktops. Based upon X^2, Boomers who play games online are more likely to use their cellphone rather than other digital devices.

If you play games online, how frequently?

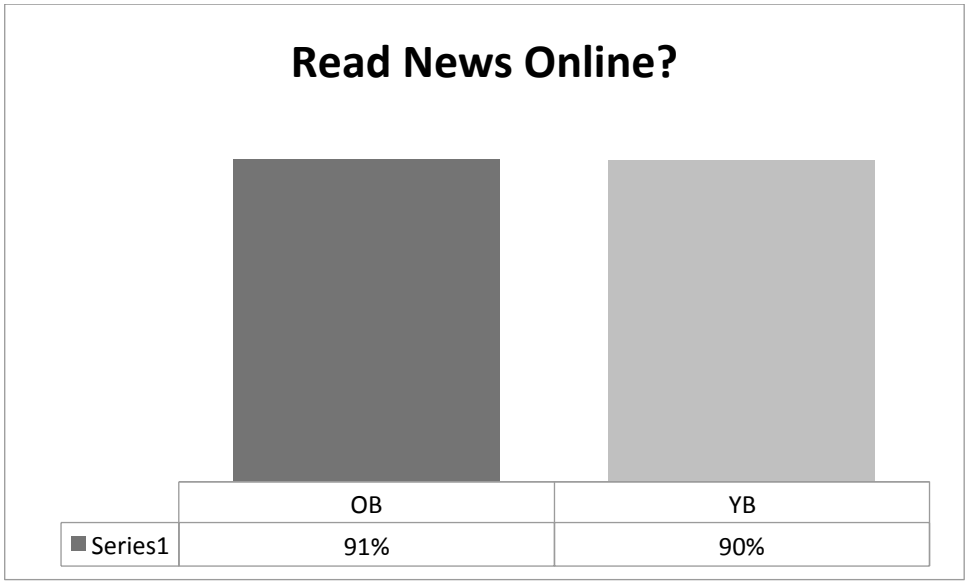


N=341; OB=272, YB=69

Figure 28. Online gaming frequency.

Asked about their online game playing frequency, 66% of Older Boomers reported daily gaming and 61% of Younger Boomers reported doing so daily. Twenty-three percent of Older Boomers reported gaming on a weekly basis and 20% of the Younger Boomers reported doing so. Twelve percent of Older Boomers indicated they play games online less than weekly and 25% of Younger Boomers play games online less than weekly.

10. Do you read news online?

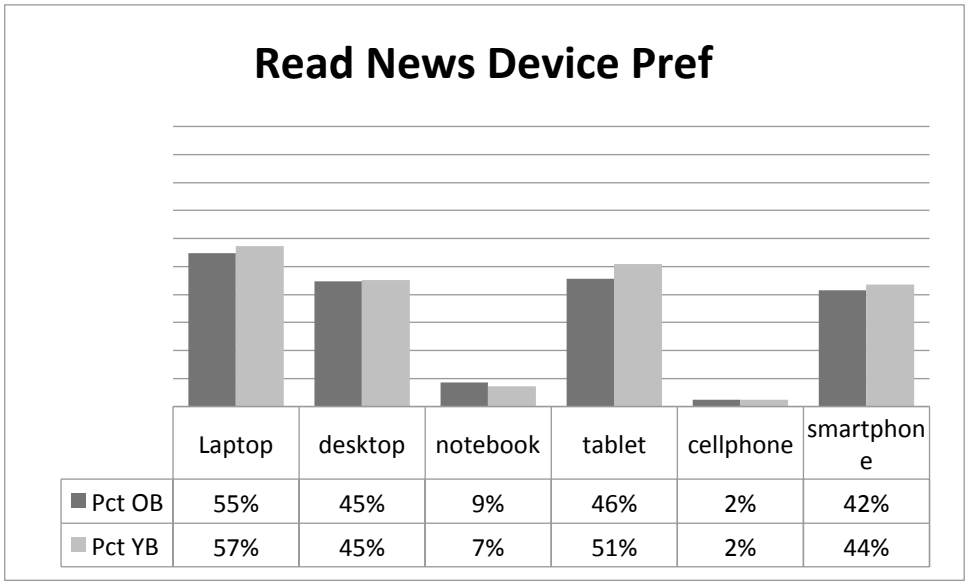


N=607; OB=483, YB=124

Figure 29. Do you read news online?

Ninety-one percent of Older Boomers and 90% of Younger reported reading news online.

If you read news online, which device(s) do you use? Check all tht apply.



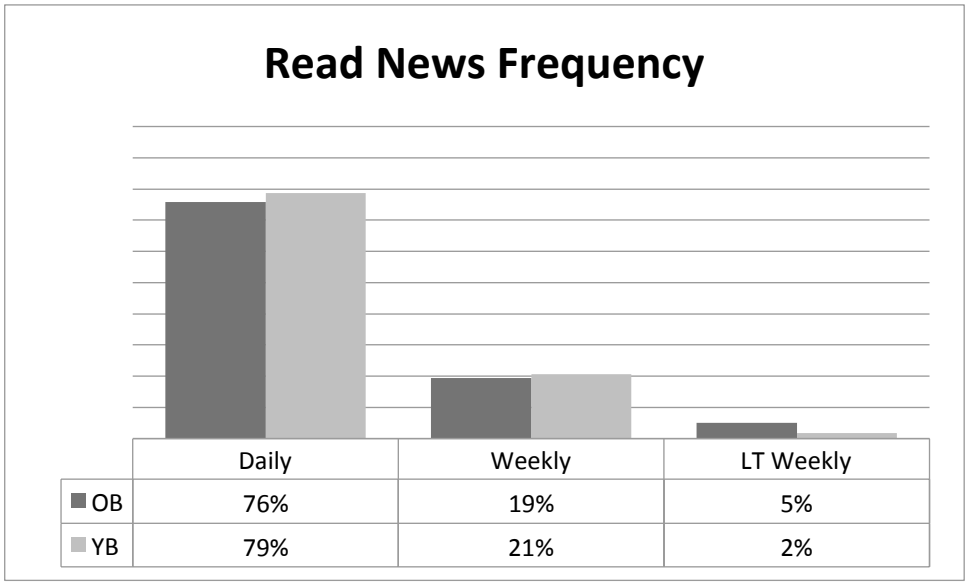
N=550; OB=438, YB=112

Figure 30. Online news reading device preference.

Of the 604 respondents to this question, 550 responded affirmatively.

Older Boomers reported reading news online using laptops, tablets, desktop, and smartphones at 55%, 46%, 45%, 42% respectively. Younger Boomers reported using laptops, tablets, desktops, and smartphones 57%, 51%, 45%, and 44% respectively. Based upon X^2, when reading news online, Boomers are likely to use a cellphone or a desktop computer.

If you read news online, how frequently?

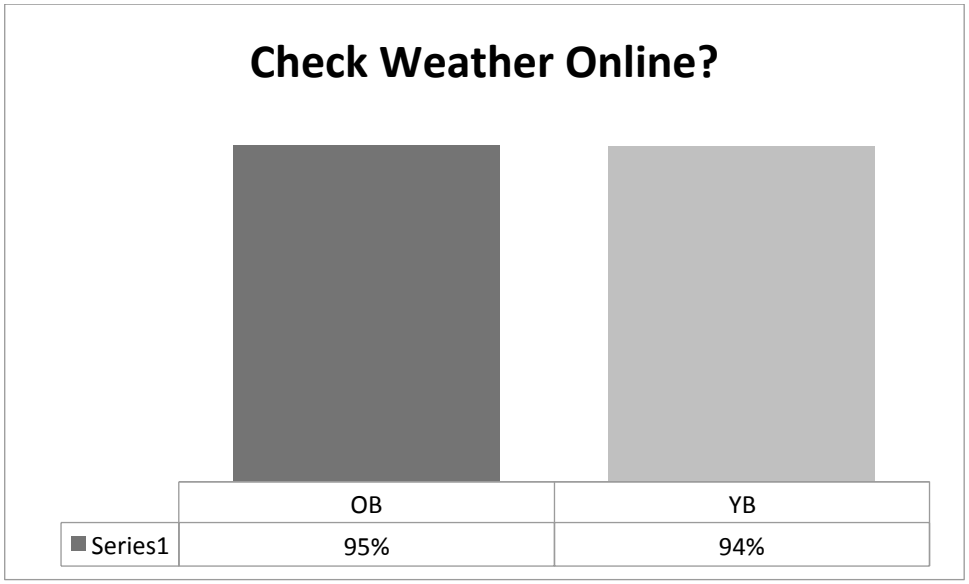


N=550; OB=438, YB=112

Figure 31. Online news reading frequency.

When asked how frequently they checked news online, 76% of Older Boomers reported they checked daily and 79% of Younger Boomers reported doing so. Nineteen percent of Older Boomers indicated they check the news online weekly and 5% check it less than weekly. Twenty-one percent of the Younger Boomers check news online weekly and 2% check it less than weekly.

11. Do you check the weather online?

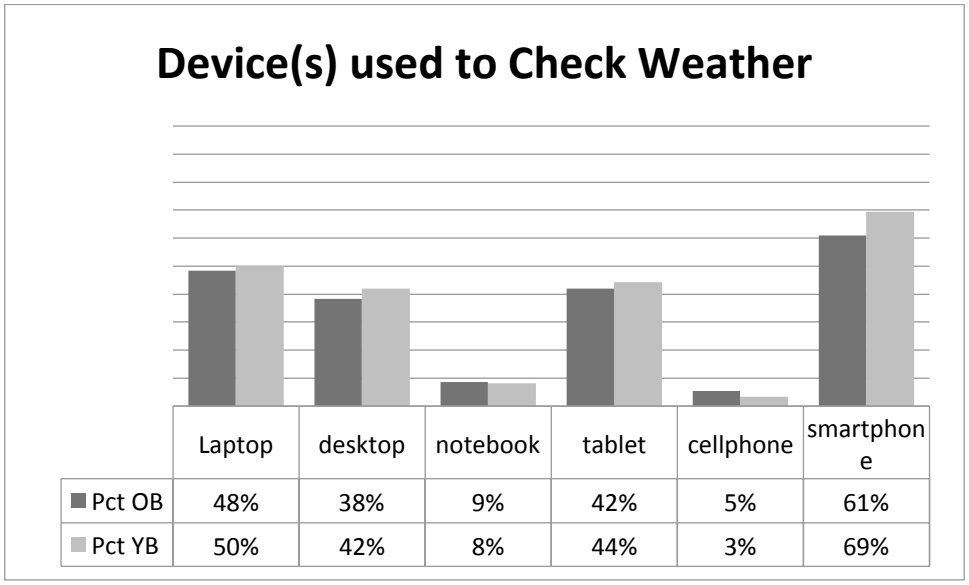


N=602; OB=478, YB=124

Figure 32. Do you check weather online?

When asked if they check the weather online, 95% of Older Boomers and 94% of Younger Boomers indicated that they do check weather online.

If you check the weather online, which device(s) fo you use? Check all that apply.



N=574; OB=457, YB=117

Figure 33. Online weather checking device preference.

There were 602 respondents to this question of which 574 responded affirmatively. As seen in Table 11, the device used while checking weather online is significant.

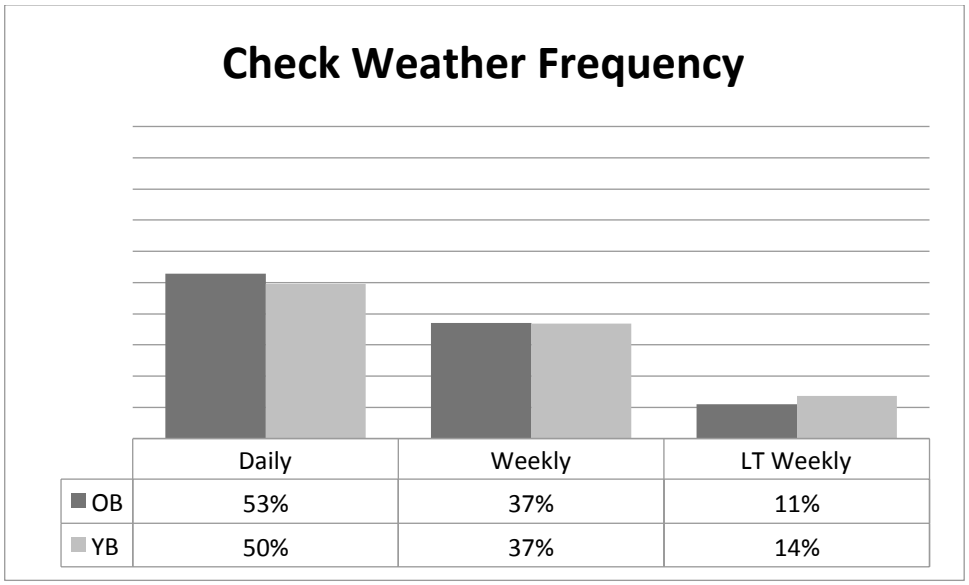
Sixty-one percent of Older Boomers check weather online using smartphones and 69% of Younger Boomers do so. Forty-eight percent of the Older Boomers check it using laptop computers, 42% using tablets and 38% using desktops. Sixty-nine percent of Younger Boomers check weather online using smartphones, 50% percent using laptops, 44% using tablets and 42% using desktops.

Table 11

Check Weather Device Preference

	X^2	Sig.
Check Weather using smartphone	3.83	.05

If you check the weather online, how frequently?



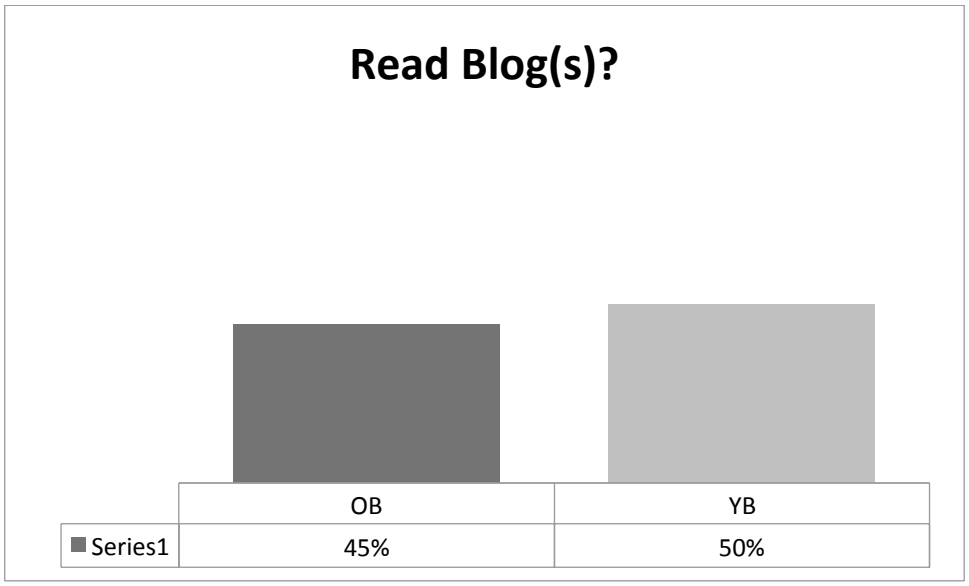
N=574; OB=457, YB=117

Figure 34. Online weather checking frequency.

When asked the frequency with which they go online to check weather, 53% of the Older Boomers check it daily, 37% check it weekly and 11% check it less than weekly. Fifty percent of

Younger Boomers check weather online daily; 37% check it weekly and 14% check it less than weekly.

12. Do you read blogs?

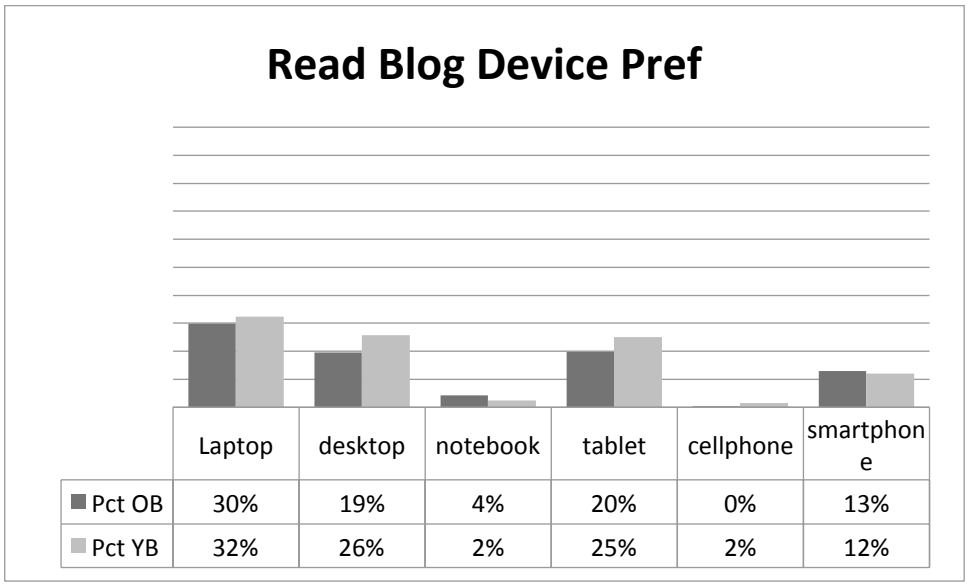


N=607; OB=483, YB=124

Figure 35. Do you read blogs?

Forty-five percent of Older Boomers and 50% of Younger Boomers reported reading blogs.

If you read blogs, which device(s) do you use? Check all that apply.



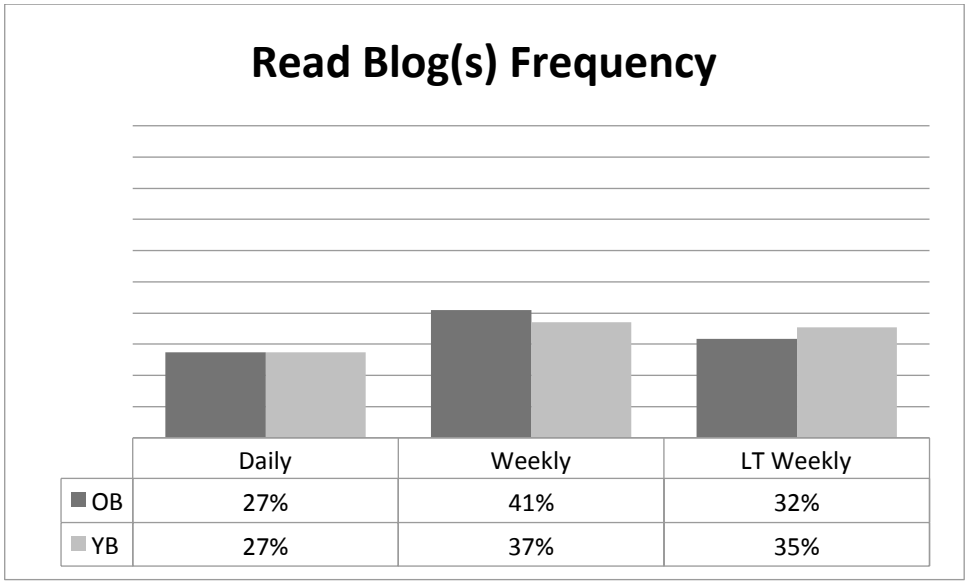
	Laptop	desktop	notebook	tablet	cellphone	smartphone
Pct OB	30%	19%	4%	20%	0%	13%
Pct YB	32%	26%	2%	25%	2%	12%

N=277; OB=215, YB=62

Figure 36. Blog reading device preference.

Of the 607 respondents to this question, 277 responded affirmatively. Older Boomers reported reading blogs using laptops, tablets, desktops, and smartphones 30%, 20%, 19%, and 13% respectively while Younger Boomers reported using laptops, desktops, tablets, and smartphones 32%, 26%, 25%, and 12% respectively.

If you read blogs, how frequently?

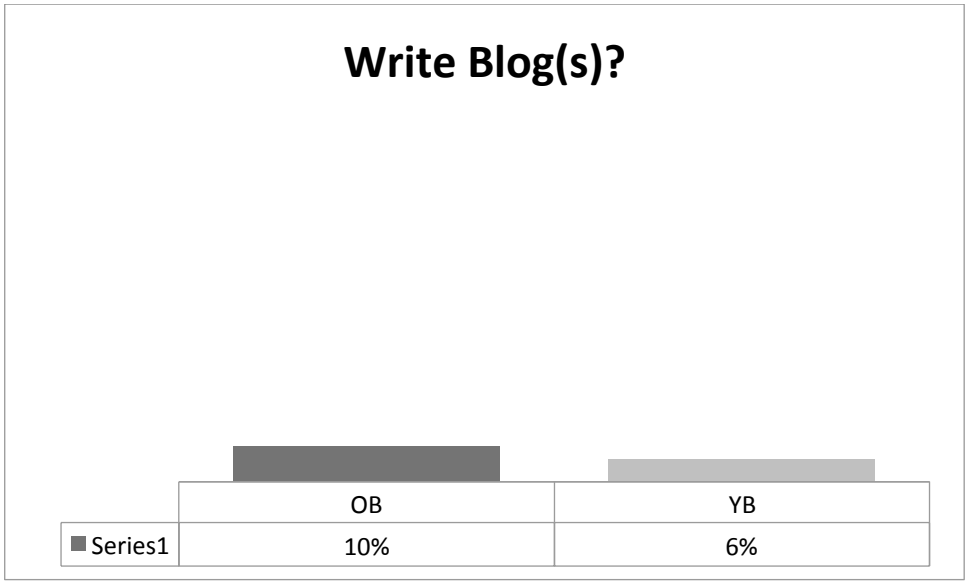


N=277; OB=215, YB=62

Figure 37. Blog reading frequency.

Forty-one percent of the Older Boomers who answered this question affirmatively reported reading blogs on a weekly basis, 32% less than weekly, and 27% daily. Thirty-seven percent of the Younger Boomers who responded to this question affirmatively reported reading blogs on a weekly basis, 35% less than weekly and 27% daily.

13. Do you write a blog or blogs?

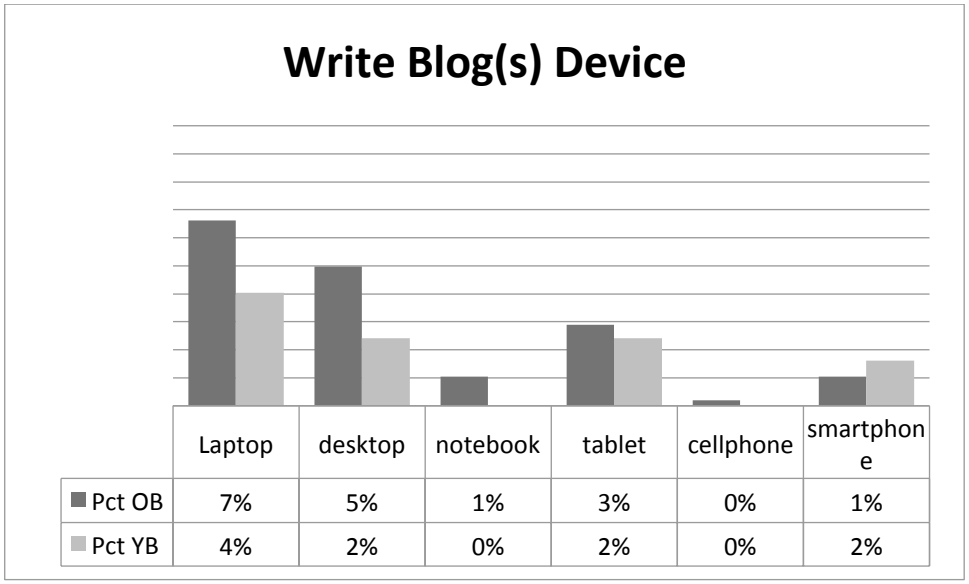


N=602; OB=478, YB=124

Figure 38. Do you write a blog?

Asked if they write blogs, 10% of the Older Boomers and 6% of the Younger Boomers indicated that they write blogs.

If you write a blog or blogs, which device(s) do you use? Check all that apply.



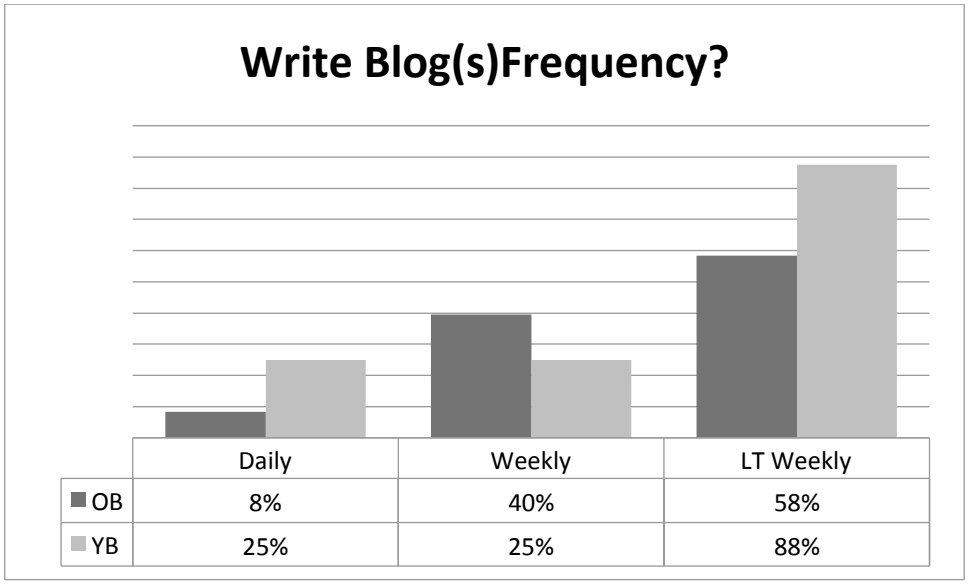
N=56; OB=48, YB=8

Figure 39. Blog write device preference.

There were 602 respondents to this question and 56 responded affirmatively.

Responding to the question of what device do you use when writing a blog, 7% of Older Boomer participants use a laptop, 5% use a desktop, 3% use a tablet and 1% use a smartphone. Responding to the same question, 4% of Younger Boomers use a laptop, 2% use a desktop, 2% a tablet and 2% a smartphone. Based upon X^2, Boomers who write blogs are likely to use a smartphone when doing so.

If you write a blog or blogs, how frequently?

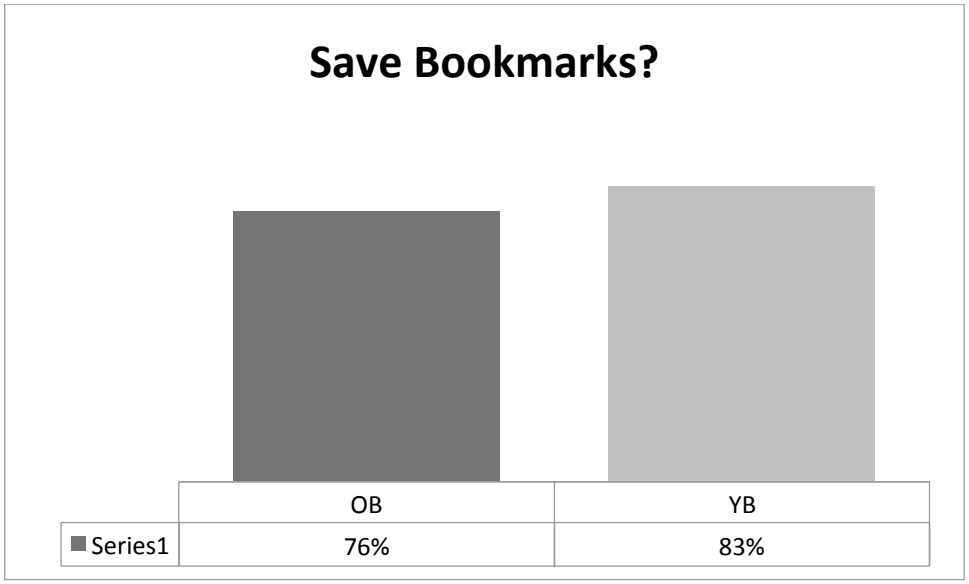


N=56; OB=48, YB=8

Figure 40. Blog write frequency.

Asked to indicate the frequency with which they write blogs, Older Boomers responded less than weekly (58%), weekly (40%) and daily (8%) and Younger Boomers responded less than weekly (88%), weekly (25%) and daily (25%).

14. Do you save online bookmarks?

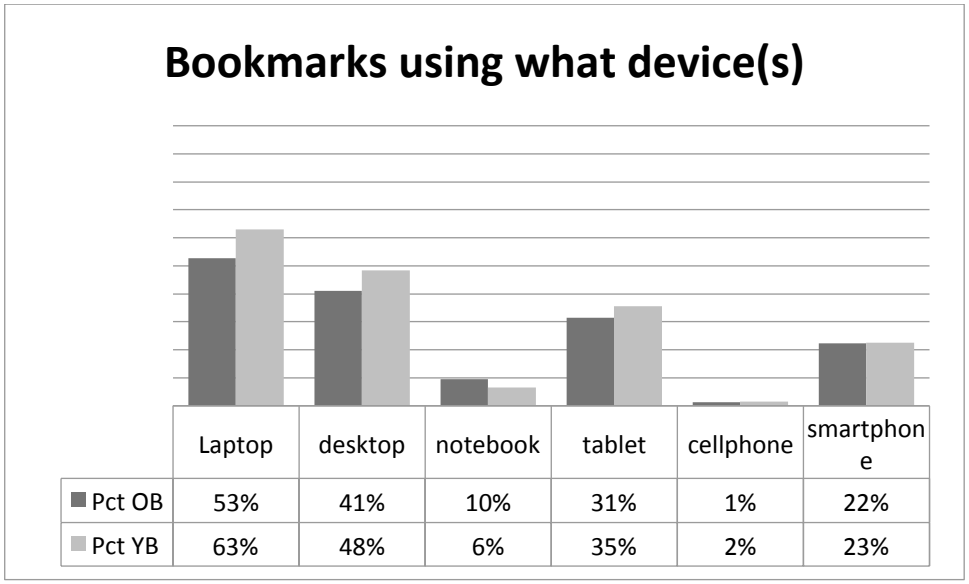


N=605; OB=481, YB=124

Figure 41. Do you save bookmarks?

Asked if the save online bookmarks, 76% of Older Boomers indicated that they do and 83% of Younger Boomers indicated that they do.

If you save online bookmarks, which device(s) do you use? Check all that apply.



	Laptop	desktop	notebook	tablet	cellphone	smartphone
Pct OB	53%	41%	10%	31%	1%	22%
Pct YB	63%	48%	6%	35%	2%	23%

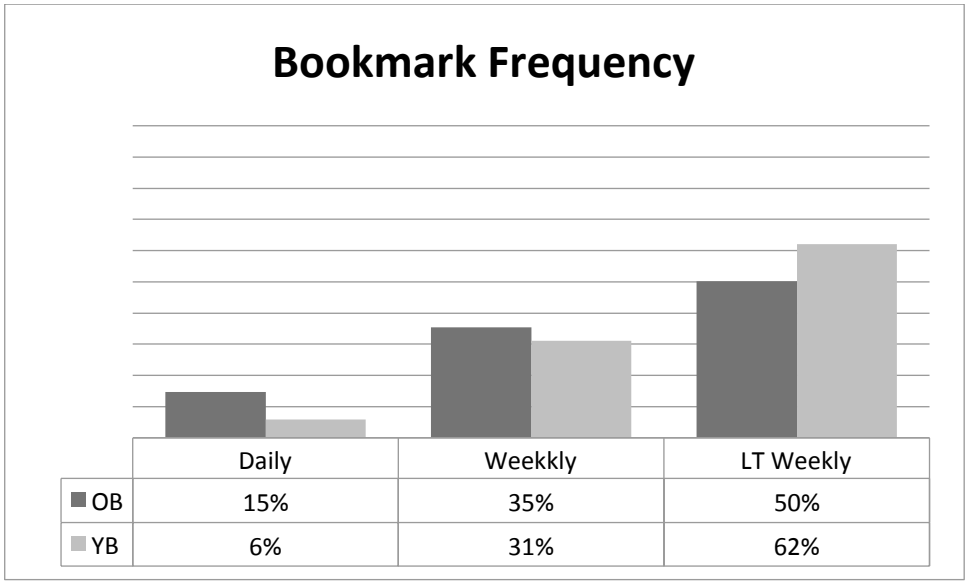
N=470; OB=367, YB=103

Figure 42. Bookmark saving device preference

Of the 605 respondents to this question, 470 responded affirmatively.

Older Boomers save bookmarks using laptops (53%), desktops (41%), tablets (31%), and smartphones (22%). Younger Boomers who save bookmarks do so using laptops (63%), desktops (48%), tablets (35%), and smartphones (25%).

If you save online bookmarks, how frequently?



N=470; OB=367, YB=103

Figure 43. Bookmark saving frequency.

As seen in Table 12, bookmarking frequency is significant. Fifty percent of Older Boomers indicated that they save bookmarks less than weekly, 35% reported weekly, and 15% indicated they save bookmarks daily. Sixty-two percent of Younger Boomers reported they save bookmarks less than weekly, 31% indicated weekly, and 6% reported saving bookmarks daily.

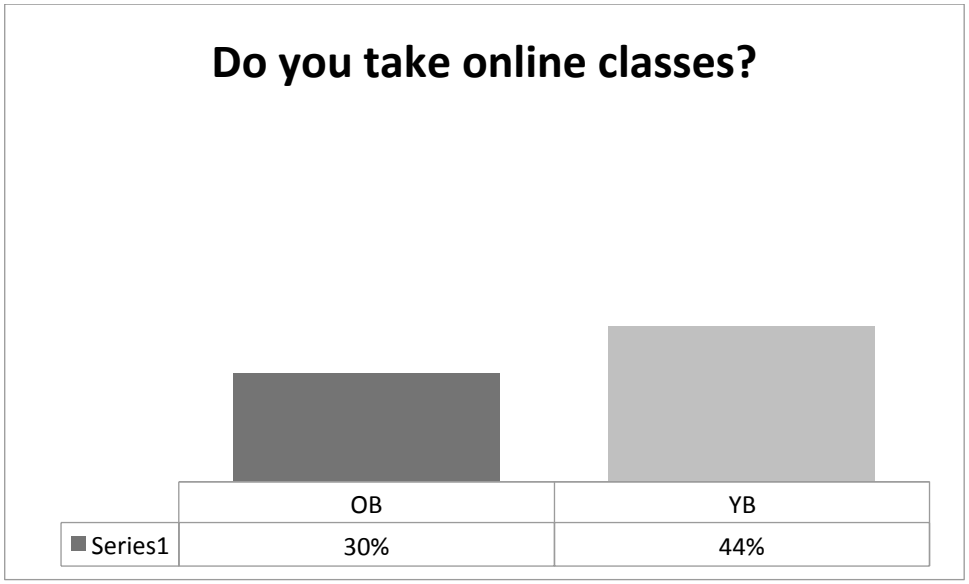
Table 12

Bookmark Saving Frequency

	X2	Sig.
Bookmark Saving Frequency?	7.49	.02

(N=470)

15. Do you take classes online?



N=605; OB=482, YB=123

Figure 44. Do you take online classes?

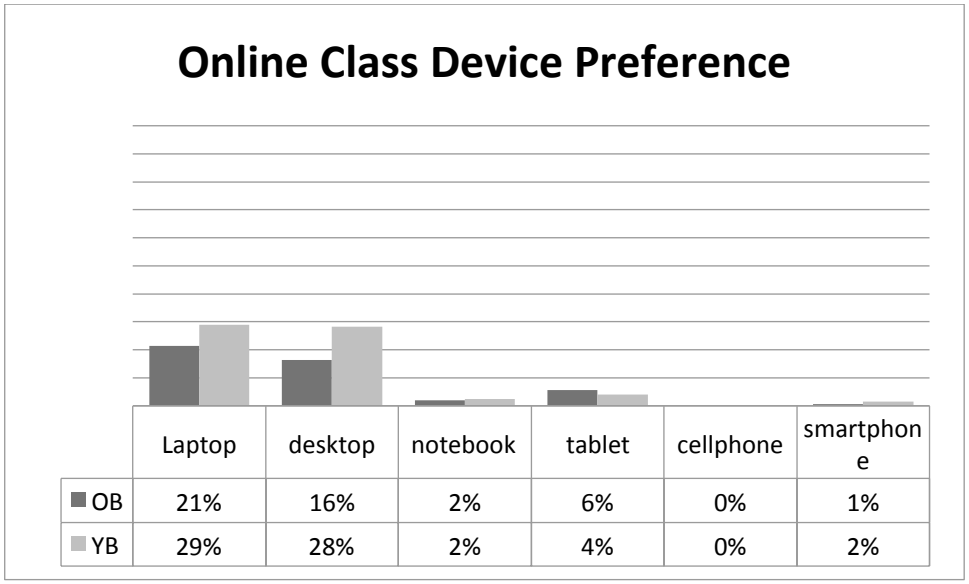
As seen in Table 13, taking online classes is significant. Thirty percent of Older Boomers and 44% of Younger Boomers reported taking online classes.

Table 13

Take Online Classes

	X2	Sig.
Take Online Classes	7.49	.01

If you take classes online, which device(s) do you use? Check all that apply.



	Laptop	desktop	notebook	tablet	cellphone	smartphone
OB	21%	16%	2%	6%	0%	1%
YB	29%	28%	2%	4%	0%	2%

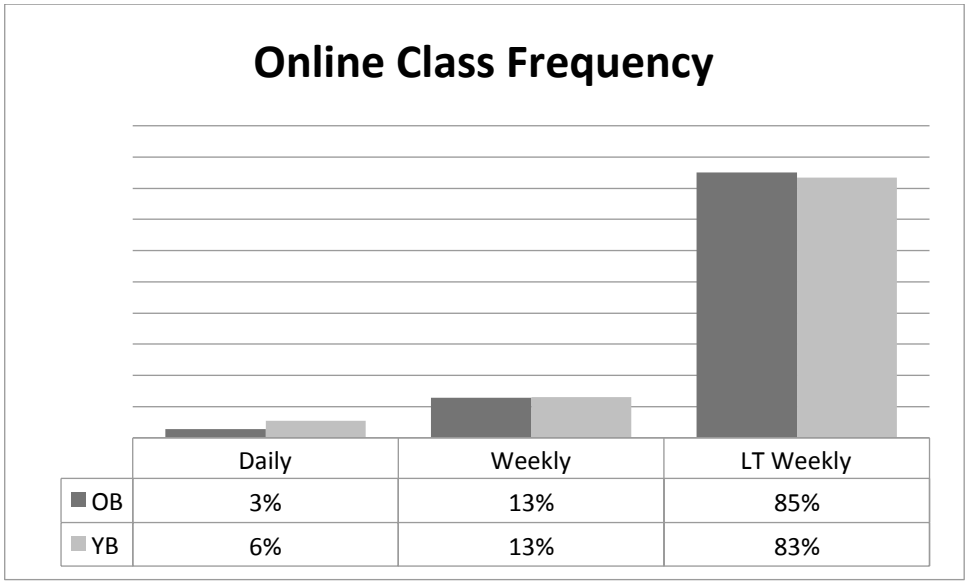
N=201; OB=147, YB=54

Figure 45. Online classes device preference

There were 605 respondents to this question of which 201 responded affirmatively.

Asked about the device(s) they use to take online classes, 21% of Older Boomers indicated laptop computers and 16% indicated desktops. Six percent indicated they take online classes using tablets. Twenty-nine percent of Younger Boomers reported using laptops to take online classes; 28% reported using desktops, 4% reported using tablets and 25% each reported using notebooks or smartphones. Based upon X^2, Boomers who take classes online are likely to use a notebook computer.

If you take classes online, how frequently?

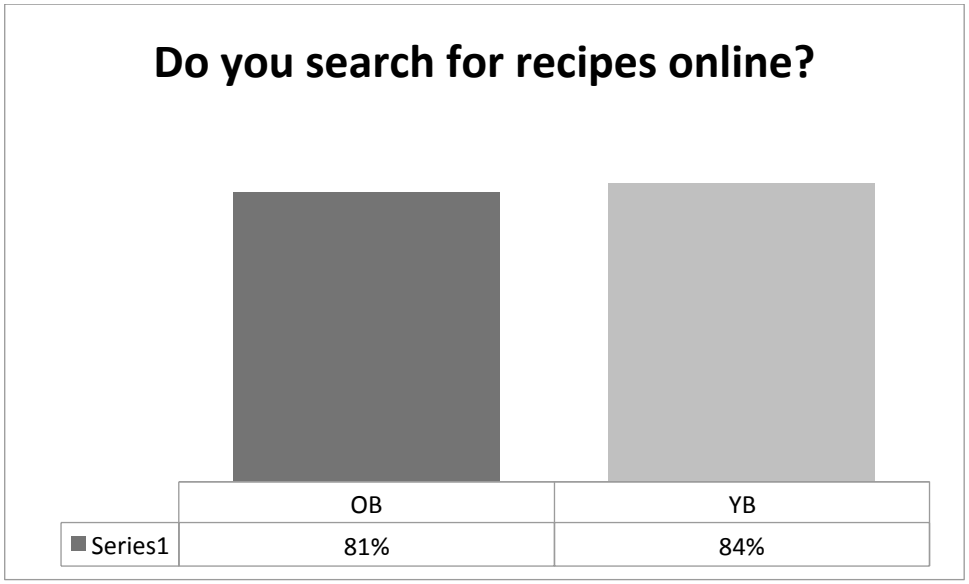


N=201; OB=147, YB=54

Figure 46. Online class frequency.

Asked about online class frequency, 85% of Older Boomers and 83% of Younger Boomers reported taking online classes on a less-than-weekly frequency. Thirteen percent of both Older and Younger Boomers indicated they take classes weekly and 3% of the Older Boomers and 6% of the Younger Boomers indicated that they take classes daily.

16. Do you look for recipes online?

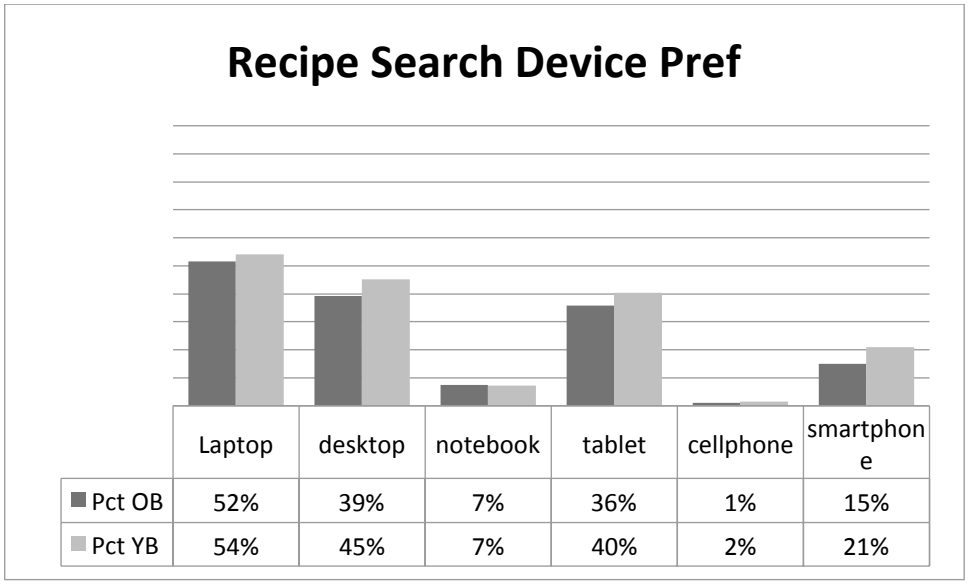


N=602; OB=482, YB=124

Figure 47. Do you search recipes online?

When asked if they search for recipes online, 81% of the Older Boomers and 84% of the Younger Boomers responded affirmatively.

If you look for recipes online, which device(s) do you use? Check all that apply.



	Laptop	desktop	notebook	tablet	cellphone	smartphone
Pct OB	52%	39%	7%	36%	1%	15%
Pct YB	54%	45%	7%	40%	2%	21%

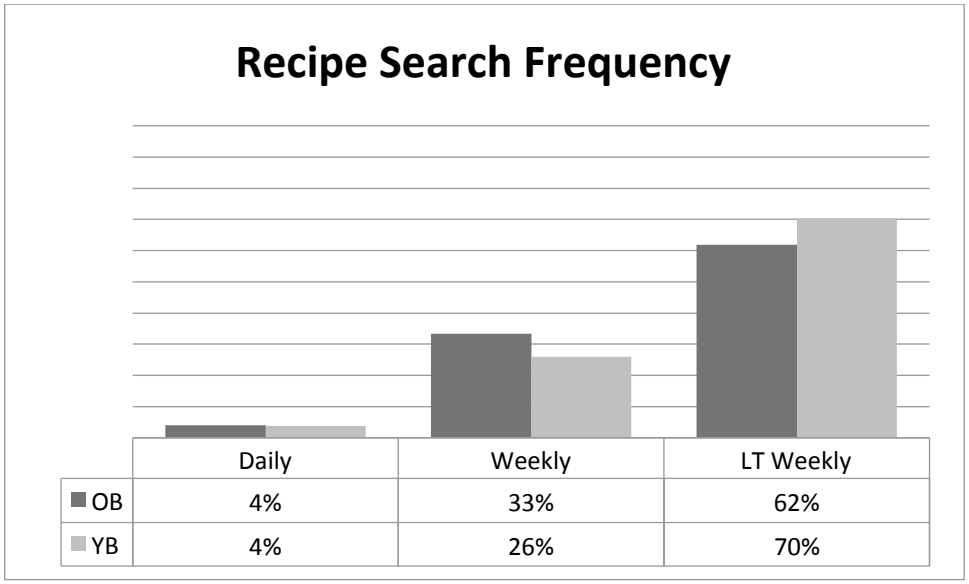
N=497; OB=393, YB=104

Figure 48. Recipe search device preference.

There were 602 respondents to this question of which 497 responded affirmatively.

Asked which devices they used to search for recipes online, 52% of Older Boomers reported using laptop computers, 39% use desktops, 36% use tablets and 15% use smartphones. Responding to the same question, 54% of Younger Boomers reported using laptops, 45% use desktops, 40% use tablets, and 21% use smartphones. Based upon X^2, Boomers who search for recipes online do so using a notebook or a laptop.

If you look for recipes online, how frequently?

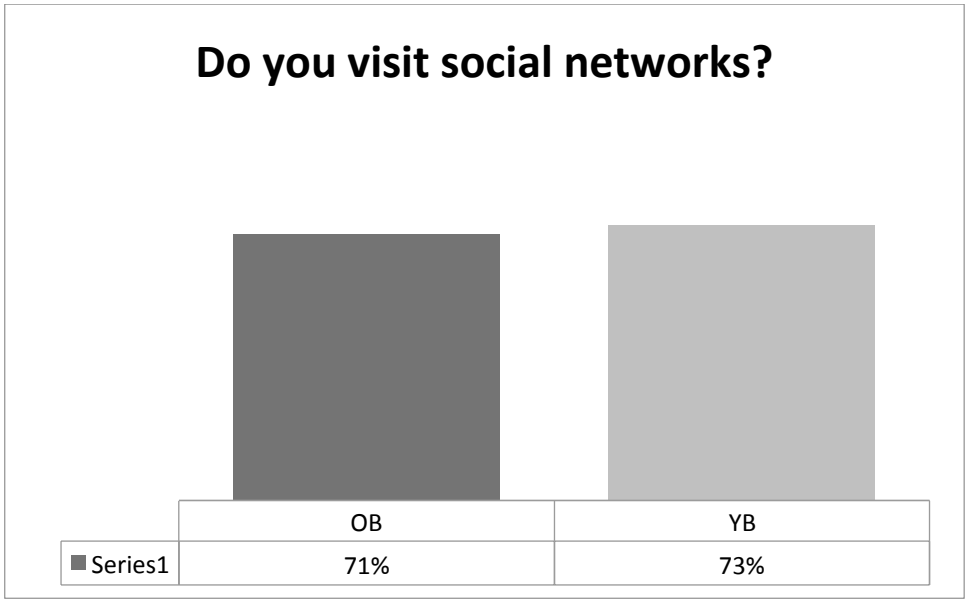


N=497; OB=393, YB=104

Figure 49. Recipe search frequency.

When asked about the frequency with which they search for recipes online, 62% of the Older Boomer participants reported less than weekly and 70% of the Younger Boomers do so less than weekly. Thirty-three percent of the Older Boomers search for recipes weekly and 4% do so daily. Twenty-six percent of the Younger Boomers search for recipes weekly and 4% do so daily.

17. Do you visit social networks online?

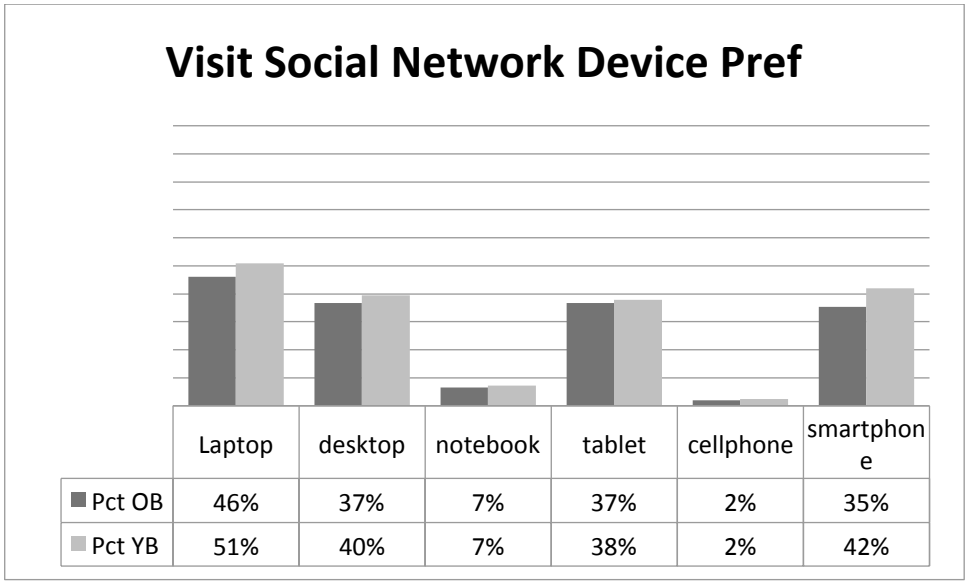


N=603; OB=479, YB=124

Figure 50. Do you visit social networks?

Asked if they visit social networks, 71% of Older Boomers and 73% of Younger Boomers responded affirmatively.

If you visit social networks online, which device(s) do you use? Check all that apply.



	Laptop	desktop	notebook	tablet	cellphone	smartphone
Pct OB	46%	37%	7%	37%	2%	35%
Pct YB	51%	40%	7%	38%	2%	42%

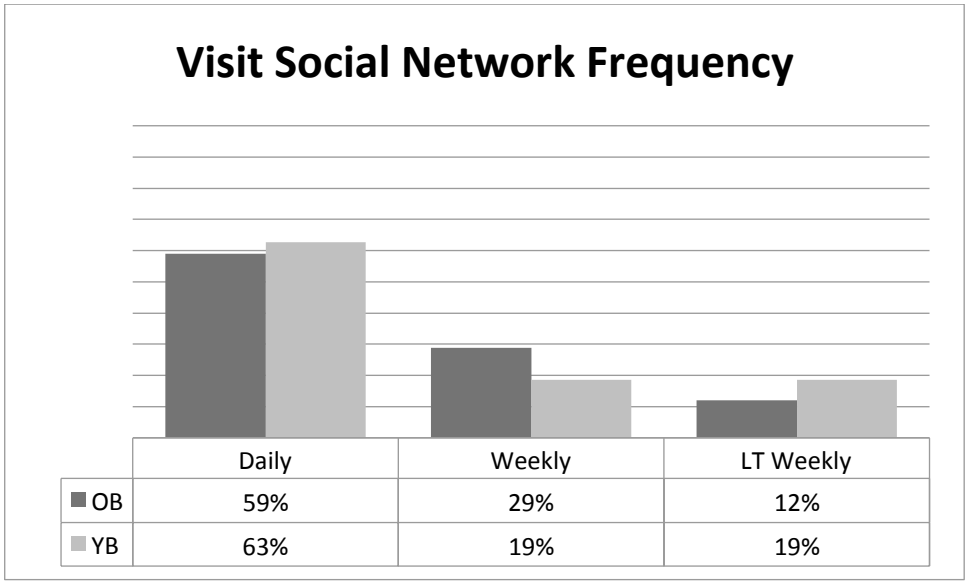
N=435; OB=344, YB=91

Figure 51. Visit social networks device preference.

Of the 603 respondents to this question, 435 responded affirmatively.

When visiting social networks, 46% of Older Boomers use laptop computers, 37% use either desktops or tablets, and 35% use smartphones. Fifty-one percent of Younger Boomers use laptops, 42% use smartphones, 40% use desktops, and 38% use tablets. Based upon X^2, Boomers who visit social networks are likely to do so using tablets and less likely to do so using notebooks.

If you visit social networks online, how frequently?



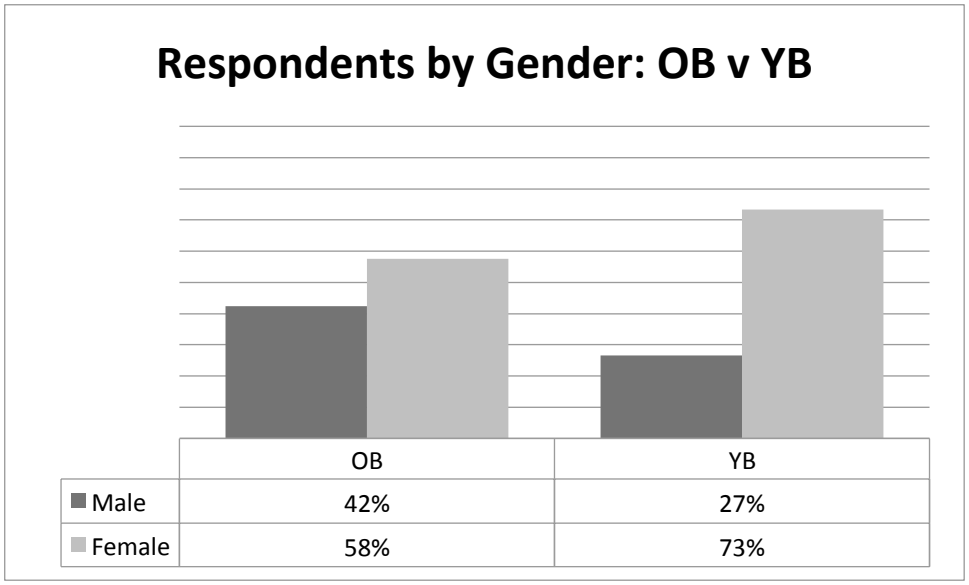
N=435; OB=344, YB=91

Figure 52. Visit social networks frequency.

When asked how often they visit social networks, 59% of Older Boomers report visiting social networks daily and 63% of Younger Boomers do so. Twenty-nine percent of Older Boomers indicate weekly visits and 12% visit social networks less than weekly. Nineteen percent of Younger Boomers visit social networks either weekly or less than weekly.

Demographics

Age/gender comparison of respondents:



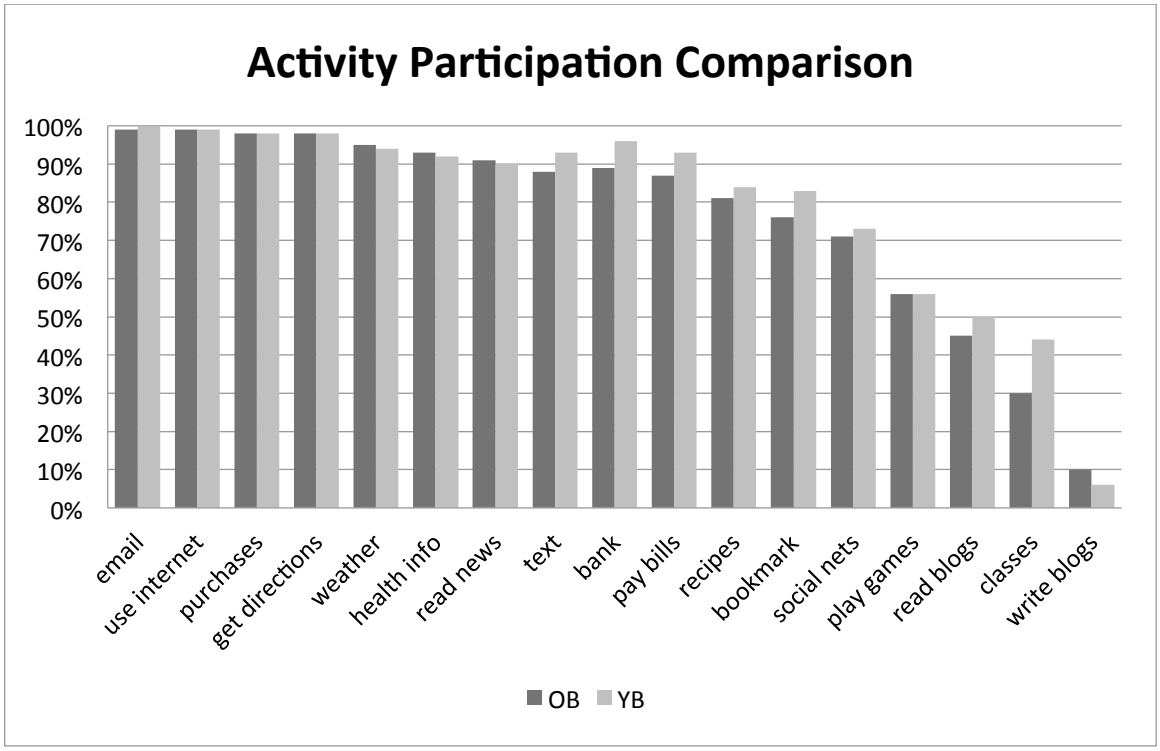
N=607; OB=483, YB=124

Figure 53. Respondents by gender.

When asked to indicate their age and their gender, 58% of the participating Older Boomers indicated they were women and 42% that they were men. Seventy-three percent of the Younger Boomer participants were women and 27% were men.

As seen in Table 14, Older Baby Boomers and Younger Baby Boomers are consistent ranking the digitally-based activities in which they engage. There are only six of the 17 activities where priorities change between the two groups and those are high priority rankings. The fifth through tenth highest ranking activities differ between the two groups.

Activity Participation Comparison:



N=607; OB=483, YB=124

Figure 54. Comparing older boomers to younger boomers participating in specific activities.

Table 14

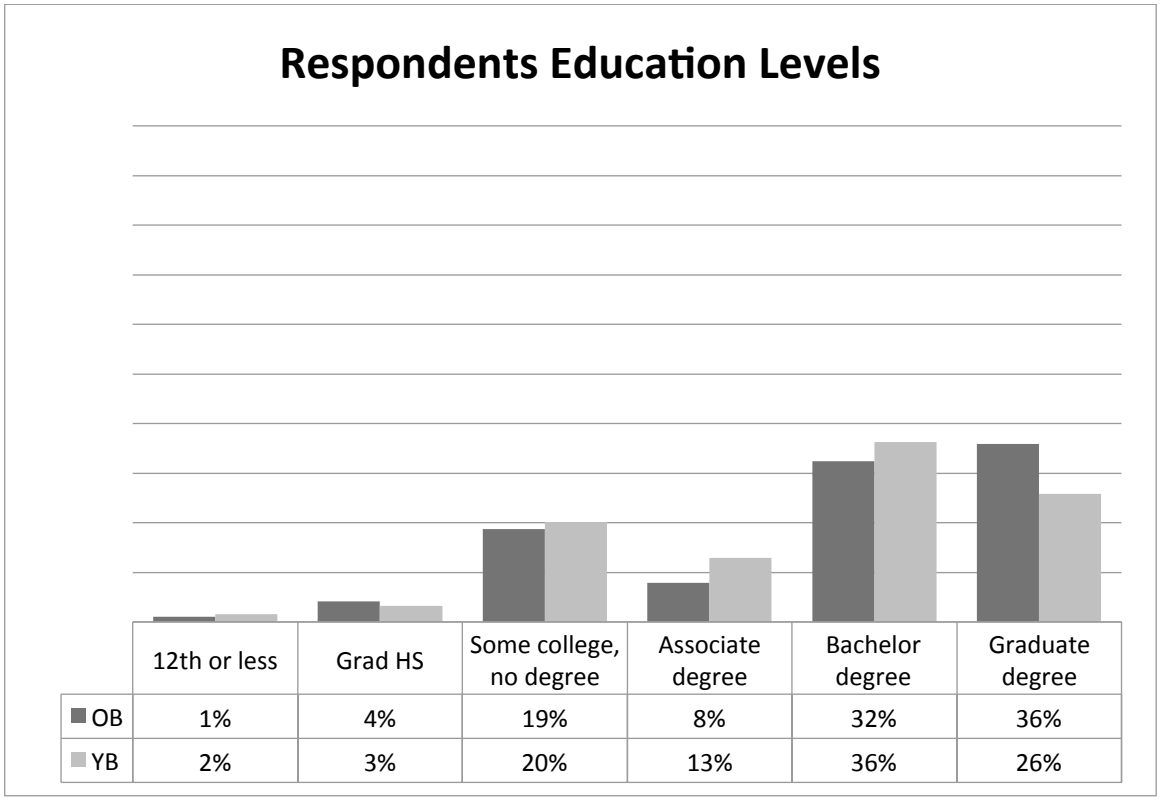
Prioritized Engagement Comparison of Older Boomers to Younger Boomers

Activity	OB (%)	YB (%)	
Email	99	100	Email
Use internet	99	99	Use internet
Purchases	98	98	Purchases
Get directions	98	98	Get directions
Weather	95	96	Bank
Health info	93	94	Weather
Read news	91	93	Text
Text	88	93	Pay bills
Bank	89	92	Health info
Pay bills	87	90	Read news

(continued)

	OB (%)	YB (%)	
Recipes	81	84	Recipes
Email	99	100	Email
Bookmark	76	83	Bookmark
Social nets	71	73	Social nets
Play games	56	56	Play games
Read blogs	45	50	Read blogs
Online Classes	30	44	Online Classes
Write blogs	10	6	Write blogs

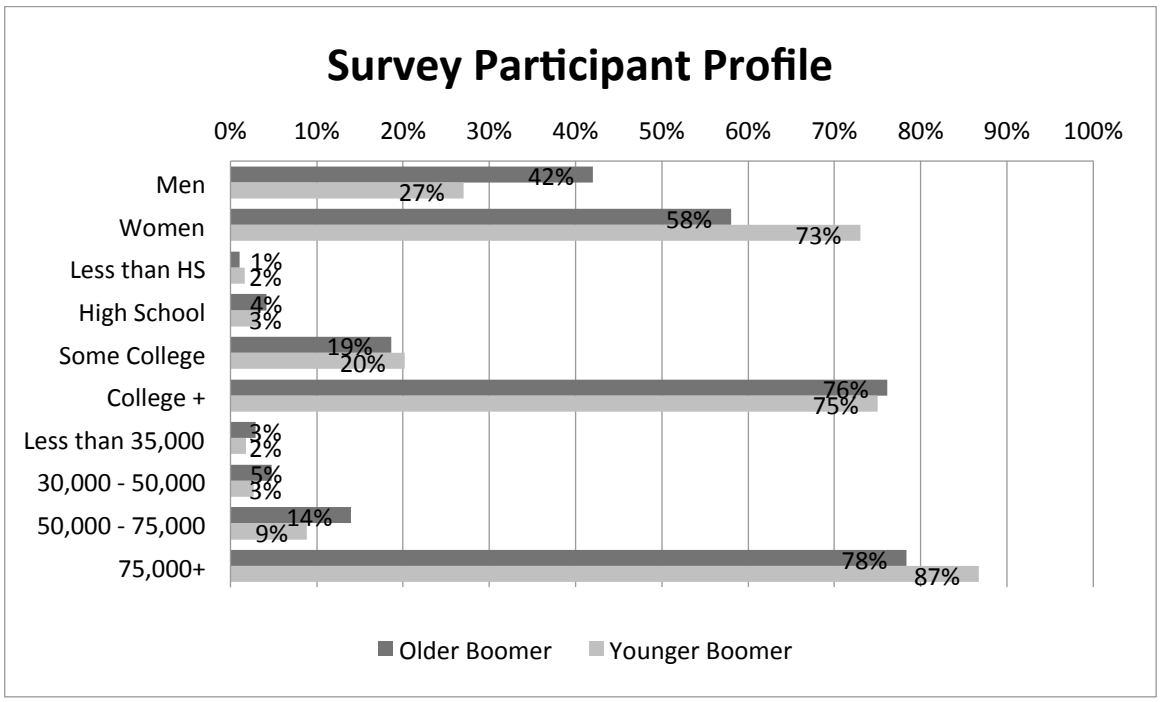
(N=607)



N=606; OB=482, YB=124

Figure 55. Respondents education levels by ob/yb demographic.

When asked to indicate their education levels, 32% of the Older Boomers reported having college degrees and 36% of the Younger Boomers reported college degrees. Thirty-six percent of the Older Boomers reported advanced degrees and 26% of the Younger Boomers reported advanced degrees.



N=607; OB=483, YB=124

Figure 56. Survey participant profile.

When constructing a general demographic profile of survey participants who responded to demographic questions, more women took the survey than men in both Older Boomers and Younger Boomers groups with 58% of the Older Boomer women taking the survey and 73% of the Younger Boomer women taking the survey. Older Boomers reported college degrees with 19% of them earning college degrees and 76% of them earning advanced degrees. Younger Boomers reported college degrees with 20% earning college degrees and 75% earning advanced degrees. Asked to indicate annual income levels, 78% of the Older Boomers reported incomes that exceed $75,000/yr. and 87% of the Younger Boomers reported incomes exceeding $75,000/yr.

Summary

The research questions guiding this survey were: How do older Baby Boomers (born 1946 to 1954) compare to younger Baby Boomers (born 1955 to 1964) in their digital literacies?

What activities do Baby Boomers engage in using their digital devices? What digital device(s) do they use to access digital media? And, with what frequencies do Baby Boomers engage in these digital activities?

A population of 8,223 Baby Boomers was emailed invitations to participate in a 17 question, three-parts per question, survey to help determine the extent to which Baby Boomers are digitally literate. The invitees all reside in Trilogy—Active Lifestyle Communities developed by Shea™, a nationally recognized builder and community developer. This population was selected because it provided a large enough group that met the age range requirement of being Baby Boomers (those people born between the years of 1946 and 1964) and because of the immediacy-of-access: the individuals living in these communities have email addresses on file within the Shea communities. Shea agreed to make those email addresses available for the study provided Shea serve as the point of contact during the dissemination of the study and the gathering of the results.

As an incentive to recruit participants, a $100.00 gift card was provided to each of eight communities enlisted for the survey. The gift cards were awarded via random drawing among survey participants at each community. SurveyMonkey™, the online survey tool used for the research, generated the coded list of participants. That list served as the source for drawing the winners of the gift cards. Shea conducted the drawing and awarded the gift cards. The research maintained the guarantee of anonymity. Approximately 8,223 email addresses were invited to participate: 659 responded favorably.

Using the research questions as a guide, the survey asked three basic questions regarding 17 activities: (a) if the respondent participated in a specific activity; (b) if yes, using what digital

device(s), and (c) how often. Five additional questions were included to allow the research to gather demographic information about the survey population.

More than 8,000 Trilogy homeowners were invited to participate and 659 participants responded favorably. Once cleaning was completed, 52 respondents were determined ineligible because their dates of birth were beyond the range of the Baby Boomer demographic (1946–1964) hence; the eligible data consist of survey responses from 607 Baby Boomers. The data were coded and ordinal data given numerical representation. SPSS was used to perform Chi-square analysis on each response category and the resulting data are presented herein.

Six of the survey questions resulted in significant relationships: email frequency, texting device preference, texting frequency, searching-directions device, online purchasing frequency, and weather-checking device. Baby Boomers are likely to check their email daily and are likely to text daily. When texting, Baby Boomers are likely to use a smartphone. They are also likely to use a smartphone when searching for directions and checking the weather. When making online purchases, Baby Boomers are likely to do so less than weekly. The complete data set can be found in Appendix E.

Chapter 5: Conclusions and Recommendations

Introduction

Digital literacy is fast becoming a necessary skillset for mediating life in the 21st century. The International Technology Education Association's Standards for Technological Literacy states that corporate executives and others in the business world, brokers and investment analysts, journalists, teachers, doctors, nurses, farmers, and homemakers all will be able to perform their jobs better if they are technologically literate. (ITEA, 2000/2002). Jones-Kavalier & Flannigan (2006) have stated that in our 21st century society—accelerated, media-saturated, and automated—a new literacy is required, one more broadly defined than the ability to read and write (Jones-Kavalier & Flannigan, 2006). The ability to confidently use, participate in and understand digital media and services is becoming an important prerequisite to effective participation in the digital economy (ACMA, 2009).

The purpose of this research was to understand the extent to which a specific population of Baby Boomers is digitally literate by examining the digital activities in which they engage, the digital devices they use, and the frequencies with which they are using the devices to engage in these activities. The study utilized an instrument based upon those developed for the ongoing Pew: Internet & American Life Project.

Summary of the Study

The research consisted of recruiting a population of Baby Boomers to participate in a survey about their digital device(s) activities. The survey consisted of 17 three-part, forced-choice, questions and five demographic identifiers. Participation was invited from a population of residents residing in age-restricted communities of people 55 years of age and older. Shea™, a nationally recognized real estate developer/builder, developed the communities chosen for the

research. There were 8,223 homeowners in eight different Shea™ communities solicited by email and 659 agreed to participate. Once data cleaning and coding were complete, 52 of the surveys were determined invalid. The birthdates of these 52 were beyond the range of the Baby Boomer demographic. The final study population consisted of 607 participants. The data were analyzed using SPSS and the results indicate that this population is predominantly college educated, generally has an average annual income of $75,000.00 or more, and demonstrates basic digital literacy skills.

Overview of the Problem

Digital technologies, digital media, and digital devices have become ubiquitous and intrinsic in modern society and using one to interact with the others requires specific skillsets—digital literacies—be learned (Lankshear & Knobel, 2006). Generation Z was born into them. The Millennials (Generation Y) readily adopted them. Gen Xers easily and quickly learned them. Seniors, those born prior to 1946, reportedly want little to do with them. What about Baby Boomers?

"Baby Boomers control 70% of the total net worth of American households resulting in $7 trillion of wealth and (they) account for a dramatic 40% of total consumer demand" (Todays Digital Solutions, 2013, para 2). By 2015, those aged 50 and older will represent 45% of the U.S. population. In the next ten years, U.S. baby boomers will increase their annual spending on wellness-based services from approximately $200M to $1 trillion (Pilzer, 2011).

For the purpose of this research, Baby Boomers (people born between 1946 and 1964) have been further segmented into Older Boomers (born between 1946 and 1954) and Younger Boomers (born between 1955 and 1964) for comparison purposes. Baby Boomers have history with innovation. Many inventions were designed and products created during the Boomers'

lifetimes each of which required time to reach general acceptance among the population and even more for general adoption (see Tables 2 and 3 for innovation rates of diffusion). Those inventions that did gain wide range adoption took various numbers of years to reach the point of near saturation. It took roughly 45 years for electrification to reach 90% of the United States population and it has taken less than 10 years for cell phones to do so and the smartphone is taking even less.

As cell phones morph into smart phones, their capabilities exceed remote conversation. Smartphones enable users to engage in additional activities including instant text messaging, taking (and sharing) photographs, banking, shopping, and making appointments for everything from manicures to medical appointments. Smartphones are essentially computers that can be wirelessly connected to the Internet via Wi-Fi or cellular connection. Smartphones are powered by computer-like operating systems. They include Internet web browsers. They enable users to create, store, retrieve, edit, and share all sorts of digital information.

Following on the heels of smartphones are tablet devices. They are similar to smartphones in computer-like capabilities only smaller and lighter than laptop computers and slightly larger than smartphones. Tablets are rapidly replacing laptop and notebook computers (Bell, 2012). These devices fuel the "always online" nature of today's digital society. Understanding and operating these devices requires a basic digital literacy. As the devices evolve and become increasingly capable, they can become confusing to operate. This can pose as a motivator for avoidance particularly for Baby Boomers (who are becoming senior citizens at a rate of nearly 10,000 per day). Fully participating in today's digital society requires a basic digital literacy that enables successful operation of digital devices.

Purpose Statement and Research Questions

The purpose of this research was to understand the extent to which Baby Boomers are digitally literate, the digital devices they understand and use, and the purposes for which they are using them. The study utilized an instrument based upon those used during the ongoing Pew Research Center's Internet & American Life Project. Specifically, the study presented a survey guided by the research questions and sought to infer the extent to which Baby Boomers are digitally literate. The research questions were: How do older Baby Boomers (born 1946 to 1954) compare to younger Baby Boomers (born 1955 to 1964) in their digital literacies? What activities do Baby Boomers engage in using their digital devices? What digital device(s) do they use to access digital media? And, with what frequencies do Baby Boomers engage in these digital activities?

Review of the Methodology

A request for participants was emailed to 8,223 Baby Boomers whose homes are located in any one of eight, age-restricted communities (55 years of age and older), developed by Shea Homes™. A survey link of 17 forced choice questions and five demographic identifiers was attached to the request for participations and 659 individuals agreed. The survey was conducted online using SurveyMonkey.com which hosts web-based and email-based surveys. Email contact information was provided by and coordinated by Shea Homes. As a matter of routine, Shea collects email addresses from homebuyers who move into Shea Trilogy communities and who have email accounts. These addresses are a matter of public record and Shea agreed to forward a message inviting participation in the study to each email address. Shea managed the list, compiled the results, and sent the data to this researcher.

As an incentive to participate, each community was provided a $100.00 Gift Card, to be awarded by random drawing to a survey participant from that community, SurveyMonkey™ assigned random alphanumeric IDs to survey participants when they logged into the survey. In order to further maintain participant anonymity, a representative of Shea Homes conducted the incentive drawings and awarded the winners with the gift card. An example of the survey is located in Appendix A.

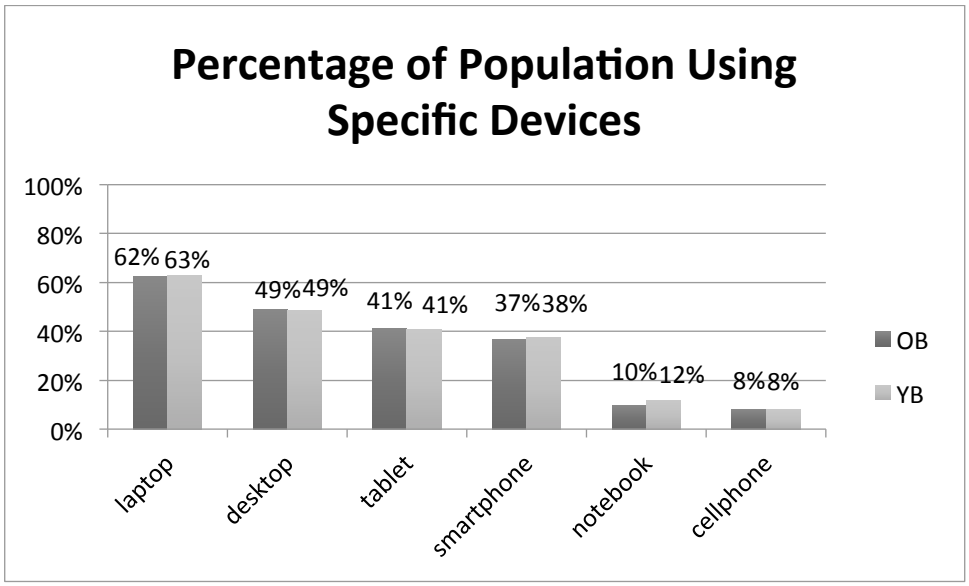
Quantitative analyses were conducted. Frequency distributions were run for each question, summary statistics were computed, and various cross-tabs created. Chi-square analyses were conducted in each category of each question. Results were generated comparing Older Boomers to Younger Boomers to determine if there were any differences in digital literacy between the two groups.

Major Findings

It must be noted that this research population of Baby Boomers represents a highly specific group of homeowners who live in age-restricted resort communities. Their demographic profiles indicate that the majority of respondents in both groups were women. The respondents are predominantly college educated and most have annual incomes of $75,000 or more per year. It could be inferred that Baby Boomer women with college educations and annual incomes of $75,000.00 or greater are likely to be digitally literate. However, there is only this research population and the findings are specific to this population. Further research into Baby Boomers digital literacy utilizing a more broad demographic would be an interesting study to compare to this research.

The data from this study tend to indicate sufficient digital literacy among this sample of Baby Boomers. “Sufficient” insofar as they profess to possess baseline skills enabling them to

engage in the Pew-noted, most frequently engaged Internet activities. Younger Baby Boomers tend to engage more in activities sometimes perceived as riskier or trendier such as banking online, paying bills online, and texting rather than phoning or emailing. According to the responses, 90% of Younger Boomers pay bills online and 87% of the Older Boomers do so; 92% of Younger Boomers bank online and 89% of the Older Boomers do so; 93% of Younger Boomers text and 88% of Older Boomers do so. Also, the research indicated that many Younger Boomers use smartphones as their primary device of choice. Older Boomers tend to use laptops, desktops and tablets. Also, of interest is that the 607 respondents reported using an average of 1,799 device types. This indicates that respondents use an average of three different devices while engaging in some or any of the specific activities. As an indicator of digital literacy, the use of three different types of devices to interact with the Internet and with each other would enable one to infer a solid, if basic, digital literacy.



N=607

Figure 57. Percentage of bb using specific devices.

Findings Related to the Literature

"Regarding teaching baby boomer/senior citizens digital literacies, the senior population, like late adopters of 'newfangled gadgets,' slowly approach the new literacy like they might a foreign language that is complex and of questionable use" (Jones-Kavalier & Flannigan, 2006, p. 3). Prensky described "non-IT-literate individuals as burdened with an accent—non-native speakers of a language, struggling to survive in a strange new world" (Prensky, 2001, p. 2).

A study designed to assess this perception employed Davis's technology adoption model (TAM) in which perceived usefulness is recognized as the most significant predictor of end-user new technology adoption intention (Davis, Bagozzi, & Warshaw, 1989). It concluded that perceived usefulness and ease of use were successful predictors of end-user new technology adoption. That study was conducted in 2006, five years before the first Baby Boomer became a senior citizen. How likely or unlikely are Baby Boomers to continue the senior citizen tradition of reluctance to use new information technology? According to the following citations, not very likely!

A Pew research report of device usage conducted during 2010 indicates that 65% YB and 64% OB used desktop computers: 49% YB and 43% OB used laptop computers; 4% YB and 3% OB used tablets; 86% of YB and 84% of OB used cell phones. According to Laurie Orlov (2011) 78% of Baby Boomers use the Internet, 52% use a search engine daily, 58% look online for health information, 51% use social networking sites, 85% have a cell phone, 24% have a smartphone, 13% have an e-reader, 8% have a tablet. According to this study, by comparison, 99% use the Internet and 71% visit social network sites; 8% use a cell phone, 38% use a smartphone, and 41% use a tablet (Orlov, 2011).

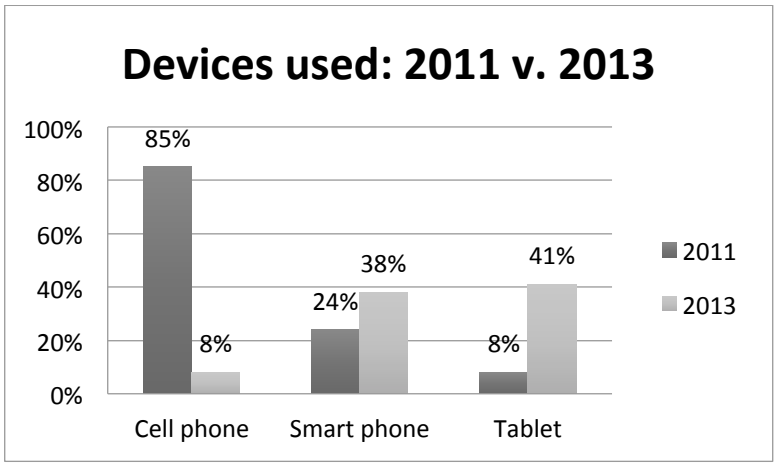


Figure 58. Devices used – 2011 v. 2013.

"Older Adults and Technology Use" (2014) states that 79% of older Internet users (age 50-64) are online daily, 87% are college graduates and 90% have incomes of $75,000 plus. Some of the data gathered in this study indicate that 96% of Baby Boomers go online daily, 76% have college degrees, and 83% have incomes of $75,000 plus (Smith, 2014).

This study looked more closely at assessing Baby Boomers' digital literacy by learning in which activities Baby Boomers engaged, with what frequencies and using what devices. One can infer that the more engaged with digital activities at high frequencies and using numerous digital devices, the more literate they must be in order to do so.

One hundred percent of the Baby Boomers in this study use the Internet and 96% use it daily. When using the Internet, 80% use a laptop computer, 74% use a smartphone, 64% use a desktop, and 59% use a tablet. It is interesting that only laptop computers are used more frequently than smartphones when Boomers use the Internet. (An anecdotal complaint registered in the notes section of the study by one of the participants stated that "smartphone screens are too small to read. 'That's why I'll never own one.'") One can surmise that smartphone use will

increase particularly as smartphones morph into phablets (tablet-sized smartphones that have slightly larger screens and are easier to read).

One hundred percent of this population of Baby Boomers send and receive email; 93% do so daily while 4% use it weekly and 4% use it less than weekly. When using email, 83% use laptop computers, 72% use smartphones, 64% use desktop computers, and 57% use tablets.

Ninety-one percent of Baby Boomers in this study send text messages; 64% text daily, 30% text weekly, and 7% text less than weekly. When texting, 75% use smartphones, 22% use tablets, and 19% use cellphones.

Ninety-eight percent of the Baby Boomers studied make online purchases. Of these, 3% make purchases daily, 27% make online purchases weekly and 71% make purchases less than weekly. Although the frequency at which Boomers make online purchases is not dramatic, the fact that 98% of those surveyed did so is surprising.

Ninety-three percent of the Baby Boomers studied bank online. 21% do so daily, 59% do so weekly, and 19% bank online less than weekly. When banking online, 61% use a laptop computer, 54% use a desktop computer, 26% use a smartphone, and 25% use a tablet.

Ninety percent of the Baby Boomers in this study pay bills online. 4% pay bills online daily; 50% pay bills online weekly, and 47% do so less than weekly. It is interesting that although Younger Boomers in general bank and pay bills online more than Older Boomers, a full 90% of Boomers surveyed pay bills online.

One hundred percent of the Baby Boomers in this study read news online. 52% of these read their online news daily, 20% read it weekly, and 3% read online news less than weekly. When reading online news, 63% use a laptop computer, 52% use a smartphone, 47% use a tablet and 45% use a cellphone.

Forty-seven percent of the Baby Boomers in this study read blogs. Of those who read blogs, 27% report they do so daily, 36% read blogs weekly and 34% do so less than weekly. When reading blogs, 31% of the Baby Boomers use laptop computers, 23% use desktop computers, 23% use tablets and 12% use smartphones.

Eight percent of the Baby Boomers studied write blogs. Those who write blogs report that 16% write blogs daily, 33% write them weekly and 73% write them less than weekly. When writing blogs, 5% of Baby Boomers use laptop computers, 3% use desktop computers, 3% use tablets and 1% use a smartphone.

Seventy-three percent of the Baby Boomers surveyed visit social networks. Those who visit social networks report that 61% do so daily, 24% weekly and 16% less than weekly. When visiting social networks, 49% use laptop computers, 39% use desktop computers, 39% use smartphones and 37% use tablets.

Thirty-seven percent of the Baby Boomers surveyed take classes online. Those who take classes online report that 83% of them take classes on a frequency less than weekly and 25% use laptop computers when taking online classes while 22% use desktop computers to take classes.

Eighty-three percent of the Baby Boomers surveyed search for recipes on the Internet. When searching for recipes, 53% use laptop computers, 43% use desktop computers, 38% use tablets, 18% use smartphones, and 8% use cellphones.

Seventy-two percent of the Baby Boomers in this study visit social networks. Of the Baby Boomers who visit social networking sites, 49% use laptop computers, 39% use desktops, 38% use tablets, 39% use smartphones, 7% use notebooks, and 2% use cellphones.

Demographically more women responded than men in both Baby Boomer groups: 58% of the Older Boomer respondents were women and 73% of the Younger Boomer respondents

were women. Those that responded indicated that 75% had college and advanced college degrees; 20% reported some college; 4% reported completing high school and 1% did not complete high school.

The participants who responded to the question about their annual income indicated that 78% of the Older Boomers and 87% of the Younger Boomers have annual incomes equal to or greater than $75,000. Additionally, 14% of the Older Boomers and 9% of the Younger Boomers reported annual incomes between $50,000 and $74,999 and 8% of the Older Boomers and 5% of the Younger Boomers reported annual incomes of less than $50,000.

The two groups of Baby Boomers are within 2% of each other in regards to sending email, using the Internet, making online purchases, and getting directions, checking the weather, reading the news, and getting health information online. Younger Boomers send and receive text messages more frequently than Older Boomers. Younger Boomers also bank online, pay bills online, search for recipes online, save bookmarks, visit social networks, read blogs, and take classes more than Older Boomers.

Unanticipated Outcomes

The reported number of digital devices used by the 607 Baby Boomer participants peaked at 1,885 indicating that this research group averaged using three different devices when using the Internet. As one measure of digital literacy (the number of device types used by an individual), one could conclude that persons using more than one type of digital device to interact with the digital world around them must possess a level of basic digital literacy. Although devices' user interfaces are often similar, they are not necessarily common among device types and using one device type does not presume switching to another device as easy as driving a different model automobile. Even the most basic functionality of the devices is generally different and therefore

one must learn how to use the different device. Hence, that our research population is using an average of three different devices provides us a clear indication of basic digital literacy.

The most common devices used regardless of activity were laptop computers, used by 62% of the respondents, desktop computers used by 49% of the respondents, tablets used by 41% of the respondents, and smartphones used by 37% of the respondents. Notebooks are used by 11% of the population and cellphones are used by 8% of the respondents. While Baby Boomers using laptops as a primary digital device was expected, the fact that nearly 50% use tablets and more than one third use smartphones was unanticipated. One could infer that Baby Boomers want to be more connected during their daily activities and that carrying a table or smartphone is more convenient than carrying a laptop.

More women than men responded in both Older Boomer and Younger Boomer groups. Asked about gender, 58% of the Older Boomer respondents were women and 73% of the Younger Boomer respondents were women. Somewhat surprisingly, more women participated than men in the study. One can surmise that because Baby Boomers worked most of their lives in a less connected world where men had secretarial assistants and women usually filled those roles, Baby Boomer men might be less digitally literate than Baby Boomer women. Assuming a time when men filled management or labor roles and women performed the office work, which at some point included using a personal computer and required learning basic computer skills, women would have the edge in terms of digital literacy.

While 75% of the Boomers surveyed have college degrees, more Younger Boomers have B.A. degrees (36% to 32%) and more Older Boomers have graduate degrees (36% to 26%).

More than 280 invitees who did not participate in the survey sent email requesting to be included in future research regarding older persons and digital literacy explaining that they were

born beyond the range of Baby Boomers and would like to know how they compare with the group.

There was a semantic issue: more than a few participants interpreted survey question references to "PC" as referring specifically to a Windows computer. Microsoft has apparently done a good job advertising their comparisons of a Windows PC to a Macintosh computer. PC as used in this study was intended to refer to a generic personal computer of any model or operating system. That distinction was *not* made clear in this study and needs to be taken into account with future research regarding computer uses or digital literacy.

Conclusions

According to this study, Baby Boomers are digitally literate to the point of successfully interacting with today's digital devices, digital media, and each other at the most basic level. They use the Internet to engage in various activities from reading the news to looking up directions or recipes. They send and receive email and text messages. They play online games. Many of them bank online, pay bills online, and make online purchases. They look up health information and they visit social networks. In short, they are capable and interacting with the digital world around them using multiple digital devices. However, not all of the activities are being engaged by all the Baby Boomers: few read or write blogs or take online classes and just over half play games using their devices.

Implications for Action

While this study concludes that Baby Boomers are digitally literate, it does not specify the extent to which Baby Boomers engage in the plethora of additional available online and digital activities. Given the wealth of this population, and the high percentage of the total

American population represented by Baby Boomers, researchers could be recommended to study them in even more detail.

"Baby Boomers control 70% of the total net worth of American households resulting in $7 trillion of wealth and (they) account for a dramatic 40% of total consumer demand" (Todays Digital Solutions, 2013, para 2). By 2015, those aged 50 and older will represent 45% of the U.S. population. In the next ten years, U.S. Baby Boomers will increase their annual spending on wellness-based services from approximately $200M to $1 trillion (Pilzer, 2011). Further research should be considered that determines what Baby Boomers would like to be able to do (with a digital device) and whether or not a device or app exists to meet that requested need. Research that finds a need in the Baby Boomer population and helps fill that need may be rewarded beyond imagination. Social scientists, developers and manufacturers of digital media and digital devices would serve themselves well to investigate this population and address manifest needs and desires for digital tools and toys.

For example, there are apps the grade grocery products on a healthy-for-you scale of A to F. Used by scanning the product's bar code, the apps access the developers (growing) library of evaluated products and returns a letter grade on a wholesomeness or health-related scale (i.e., fooducate.com). Do Baby Boomers know this exists? Would they use it if they did? There are apps to find a parked car (i.e., "Find my car" and "Take me to my car") that could be of help to Boomers who forget where they parked. There are fitness tracking devices ("Fitbit Flex," "Jawbone 'Up,'" "Fuelband," and others) and product-specific apps that track physical activity, monitor vital signs and transmit reports to physicians or services for ongoing care or treatment. There are apps that compare prices of products and, using GPS in enabled devices, compare

prices at various stores and locations within a user-defined radius of the user's current position. The user can then decide if it's worth traveling X distance to save N dollars.

This study answers one question about Baby Boomers' digital literacy and it raises another. Yes, Baby Boomers possess basic digital literacy skills. How do Baby Boomers become aware of what devices and apps are available, of the devices' and apps' potential value or use to them, how and where to obtain them, and how to use them? Resources could be made available that source, evaluate, and provide free information about the plethora of devices and apps available to Baby Boomers and senior citizens. Resources could be made available to elicit activity-specific requests from Baby Boomers and forward that information to developers who could focus on Baby Boomers needs and bring forward products and services that would enhance the (digital) lives of Baby Boomers.

The data indicate a trend among Baby Boomers moving from laptop computers and desktop computers to tablets and from cellphones to smartphones. To what extent do Baby Boomers realize the extent of capabilities of these devices? How do Baby Boomers learn to more fully use these devices?

Recommendations for Further Research

This study gathered data on a specific population and a select group of activities in an effort to establish baseline evidence of Baby Boomers' digital literacy. As Baby Boomers become senior citizens at a rate of nearly 10,000 per day, it is becoming more and more important to determine whether or not these new senior citizens have the skills necessary to navigate the digital landscape and fully engage in their digital lives. This research studied a specific subset of Baby Boomers: those living in age-restricted resort communities developed by Shea Homes. It concluded that they are digitally literate—to a point of functional literacy.

Further research, similar to this study, should be conducted with additional demographics of Baby Boomers keeping the age requirement and diversifying the other variables and increasing the range of activities measured.

When conducting a survey and presenting a list of devices available for use, better definitions of the devices would be beneficial. In this study, some respondents complained that the questions regarding device(s) used were discriminatory insofar as these respondents understood PC to be a Windows-specific device and that they used Apple devices or Google devices. Used in this research, PC was intended as a generic personal computer of any operating system. Also, research should be conducted to gather information regarding existing Baby Boomer-related apps and determining how Boomers become aware of apps and how they learn to use them. There exist myriad apps addressing a wide variety of activities. It would be interesting and beneficial to gather the information about these apps and create a central repository to house information about the existence of these apps, where to obtain them, and how to use them.

Baby Boomers as senior citizens are visiting social networks. Research might look at the activities in which these Boomers are engaging to determine whether or not specific needs are being met. Are grandparents visiting with grandchildren who live remotely? Are seniors visiting other seniors for social interactions? Are seniors with disabilities seeking support groups and information from others suffering similar afflictions?

Research might address other Baby Boomers living situations. For example, what Internet access do Boomers in assisted living have and how does that compare across other Boomer populations? What broadband and/or wireless providers scale pricing for senior citizens? (Do any providers scale pricing for senior citizens?)

More in-depth research assessing Baby Boomers' ability to successfully source apps and to use them "out of the box" would enlighten concerned individuals and perhaps encourage them to establish venues to enable Baby Boomers to learn and more fully interact with the digital world around them.

Future research might include additional methods of assessing Baby Boomers' digital literacies. This study was conducted via email and using an online survey tool. Other methods of conducting the research into Baby Boomer digital literacy could include telephone interviews, personal face-to-face interviews and direct observations, and/or USPS participation requests with follow-up paper surveys. There is a bias inherent in this research in that the study was conducted completely online and presumes a most basic digital literacy from participants.

Any one or combination of the foregoing recommendations would provide valuable insight to the Baby Boomer population and would, by default, enable an increase in the digital literacy of Baby Boomers.

Concluding Remarks

The digital world is converging into the "Internet of things" driven by digital devices and digital media. Meanwhile, Baby Boomers are becoming senior citizens at a rate of nearly 10,000 each day. Historically, senior citizens are technophobes or at least technologically challenged. Anecdotally, some Baby Boomers have been observed using antiquated digital devices and maintaining that it's "good enough for what I want to do with it" attitude or approach.

Baby Boomers grew up during a time when household appliances, devices that cost in the hundreds of dollars, lasted a lifetime or were repaired or simply not replaced. This is not the case with digital devices costing hundreds of dollars. Device capabilities are increasing exponentially and device prices are decreasing rapidly. The Baby Boomers who feel what they have with their

five-year-old laptop “is good enough” might benefit from learning what else the devices would enable them to accomplish or to simply do.

A common theme throughout this research and literature review was that Baby Boomers and senior citizens adopt technology when there is a compelling reason for them to do so. It is incumbent for those of us who are aware of the benefits and potentials to alert the others and help them understand the difference digital literacy can make in their lives.

In an effort to examine that potential dilemma directly, this research gathered data to learn the extent to which Baby Boomers are digitally literate. The research findings support the perception that Baby Boomers are digitally literate to the point of functional digital literacy. It is the hope of this researcher that learning spaces will be created and learning activities will be developed and made available to encourage more fluent digital literacy among Baby Boomers and that will help them discover compelling reasons to learn about and to adopt new technologies providing them new tools for joining in this profoundly connected and available digital world.

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APPENDIX A

Survey Instrument

NOTE: The survey was presented using SurveyMonkey. Questions utilized "radio buttons" for single choice responses and "check boxes" for multiple choice responses. The first and third questions in each group are single choice and the second question can be a multiple choice question. While the design element is not presented here, the questions and available responses as presented verbatim.

1. Do you use email: Yes/No. (If NO, skip to question 2)

1B If you use email, what devices(s) do you use? Check all that apply. Laptop PC, Desktop PC, Notebook, Tablet, Cell phone, Smart phone.

1C If you use email, how frequently? Daily, Weekly, Less than Weekly.

2. Do you send and receive text messages? Yes/No (If NO, skip to question 3)

2B If you send and receive text messages, what device(s) do you use? Check all that apply. Laptop PC, Desktop PC, Notebook, Tablet, Cell phone, Smart phone.

2C If you send and receive text messages, how frequently? Daily, Weekly, Less than Weekly.

3 Do you use the Internet? Yes/No (If NO, skip to question 4)

3B If you use the Internet, what device(s) do you use? Check all that apply. Laptop PC, Desktop PC, Notebook, Tablet, Cell phone, Smart phone.

3C If you use the Internet, how frequently? Daily, Weekly, Less than Weekly.

4 Do you search for directions online? Yes/No (If NO, skip to question 5)

4B If you search for directions online, what device(s) do you use? Check all that apply. Laptop PC, Desktop PC, Notebook, Tablet, Cell phone, Smart phone.

4C If you search for directions online, how frequently? Daily, Weekly, Less than Weekly.

5 Do you make online purchases? Yes/No (If NO, skip to question 6)

5B If you make online purchases, what device(s) do you use? Check all that apply. Laptop PC, Desktop PC, Notebook, Tablet, Cell phone, Smart phone.

5C If you make online purchases, how frequently? Daily, Weekly, Less than Weekly.

6 Do you look up medical or health information online? Yes/No (If NO, skip to question 7)

6B If you look up medical or health information online, what device(s) do you use? Check all that apply. Laptop PC, Desktop PC, Notebook, Tablet, Cell phone, Smart phone.

6C If you look up medical or health information online, how frequently? Daily, Weekly, Less than Weekly.

7 Do you bank online? Yes/No (If NO, skip to question 8)

7B If you bank online, what device(s) do you use? Check all that apply. Laptop PC,

Desktop PC, Notebook, Tablet, Cell phone, Smart phone.

7C If you bank online, how frequently? Daily, Weekly, Less than Weekly.

8 Do you pay bills online? Yes/No (If NO, skip to question 9)

8B If you pay bills online, what device(s) do you use? Check all that apply. Laptop PC, Desktop PC, Notebook, Tablet, Cell phone, Smart phone.

8C If you pay bills online, how frequently? Daily, Weekly, Less than Weekly.

9 Do you play games online? (If NO, skip to question 10)

9B If you play games online, what device(s) do you use? Check all that apply. Laptop PC, Desktop PC, Notebook, Tablet, Cell phone, Smart phone.

9C If you play games online, how frequently? Daily, Weekly, Less than Weekly.

10 Do you read news online? (If NO, skip to question 11)

10B If you read news online, what device(s) do you use? Check all that apply. Laptop PC, Desktop PC, Notebook, Tablet, Cell phone, Smart phone.

10C If you read news online, how frequently? Daily, Weekly, Less than Weekly.

11 Do you check the weather online? (If NO, skip to question 12)

11B If you check the weather online, what device(s) do you use? Check all that apply. Laptop PC, Desktop PC, Notebook, Tablet, Cell phone, Smart phone.

11C If you check the weather online, how frequently? Daily, Weekly, Less than Weekly.

12 Do you read blogs? (If NO, skip to question 13)

12B If you read blogs, what device(s) do you use? Check all that apply. Laptop PC, Desktop PC, Notebook, Tablet, Cell phone, Smart phone.

12C If you read blogs, how frequently? Daily, Weekly, Less than Weekly.

13 Do you write a blog or blogs? (If NO, skip to question 14)

13B If you write a blog or blogs, what device(s) do you use? Check all that apply. Laptop PC, Desktop PC, Notebook, Tablet, Cell phone, Smart phone.

13C If you write a blog or blogs, how frequently? Daily, Weekly, Less than Weekly.

14 Do you save online bookmarks? (If NO, skip to question 15)

14B If you save online bookmarks, what device(s) do you use? Check all that apply. Laptop PC, Desktop PC, Notebook, Tablet, Cell phone, Smart phone.

14C If you save online bookmarks, how frequently? Daily, Weekly, Less than Weekly.

15 Do you take classes online? (If NO, skip to question 16)

15B If you take classes online, what device(s) do you use? Check all that apply. Laptop PC, Desktop PC, Notebook, Tablet, Cell phone, Smart phone.

15C If you take classes online, how frequently? Daily, Weekly, Less than Weekly.

16 Do you look for recipes online? (If NO, skip to question 17)

16B If you look for recipes online, what device(s) do you use? Check all that apply.

Laptop PC, Desktop PC, Notebook, Tablet, Cell phone, Smart phone.

16C If you look for recipes online, how frequently? Daily, Weekly, Less than Weekly.

17 Do you visit social networks online? (If NO, skip to question 18)

17B If you visit social networks online, what device(s) do you use? Check all that apply. Laptop PC, Desktop PC, Notebook, Tablet, Cell phone, Smart phone.

17C If you visit social networks online, how frequently? Daily, Weekly, Less than Weekly.

We have just a few more questions. We would like to know a little bit about you. Remember, all of your responses will be held in strict confidentiality,

18 In what year were you born? Please select: 1946, 1947, 1948, 1940, 1950, 1951, 1952, 1953, 1954, 1955, 1956, 1957, 1958, 1959, 1960, 1961, 1962, 1963, 1964?

19 Are you: Male, Female

20 Please select the highest degree you have received. Please select: 12^{th} grade or less; Graduated high school or equivalent; Some college, no degree; Associate degree; Bachelor's degree; Graduate degree

21 What is your household income? Please select: Less than 25,000; 25,000 to 34,999; 35,000 to 49,999; 50,000 to 74,999; 75,000 to 99,999; 100,000 to 124,999; 125,000 to 149,000; 150,000+

22 Which Trilogy community do you live in: Please select: Encanterra, Redmond Ridge, Rio Vista, Vineyards, Ardiente, Vistancia, Orlando, Monarch Dunes

THANK YOU!

Thank you for taking my survey. Your responses are very important to me. Once all the surveys have been collected and the data analyzed, summaries will be made available to all participants and possibly published @ MyTrilogyLife.com. If you would like a summary report, please contact me at the email address link below. Again, Thank you!! Respectfully, Richard O'Keeffe.
richard.okeeffe@pepperdine.edu

APPENDIX B

Pew Permission to Use Correspondence

From: Pew Internet Information [SMTP:INFO@PEWINTERNET.ORG]
Sent: Tuesday, January 24, 2012 6:53:16 AM
To: O'Keeffe, Richard (student)
Subject: RE: Internet & American Life Project: Survey Instrument Use Request
Auto forwarded by a Rule
Dear Mr. O'Keeffe,

You have the permission of the Pew Research Center's Internet & American Life project to use our survey instruments in your academic work as indicated below in your email. Our citation guidelines may be found here: http://www.pewinternet.org/Static-Pages/About-Us/Our-Research/Use-Policy.aspx

Thanks so much for taking the time to check with us on the use of our work,
Cornelia

_____

From: O'Keeffe, Richard (student) [Richard.OKeeffe@pepperdine.edu]
Sent: Monday, January 23, 2012 5:08 PM
To: Pew Internet Information
Cc: O'Keeffe, Richard (student)
Subject: Internet & American Life Project: Survey Instrument Use Request
Hello,

I am a doctoral student at Pepperdine University and I am about to begin the research aspect of my dissertation.
My research is targeting Baby Boomers exclusively to ascertain the extent of their digital literacy's and their uses of digital devices.

I am writing to request permission to use and, in some instances modify, the survey instrument(s) Pew researchers used to collect data for your Internet & American Life Project. My dissertation Chair, Dr. Margaret Weber has instructed me to obtain Pew permission prior to beginning my research, hence this request.

Prior to use, I will submit the instrument with any modifications to my IRB for approval.

Thank you for your consideration.

Respectfully,
Richard J. O'Keeffe

APPENDIX C

IRB Approval Letter

PEPPERDINE UNIVERSITY

Graduate & Professional Schools Institutional Review Board

May 14, 2013

Richard O'Keeffe 1121
[redacted]

Protocol #: E0313D10
Project Title: Baby Boomers and Digital Literacy

Dear Mr. O'Keeffe,

Thank you for submitting your application, *Baby Boomers and Digital Literacy,* for exempt review to Pepperdine University's Graduate and Professional Schools Institutional Review Board (GPS IRB). The IRB appreciates the work you and your faculty advisor, Margaret Weber, have done on the proposal. The IRB has reviewed your submitted IRB application and all ancillary materials. Upon review, the IRB has determined that the above entitled project meets the requirements for exemption under the federal regulations (45 CFR 46 - http://www.nihtraining.com/ohsrsite/guidelines/45cfr46.html) that govern the protections of human subjects. Specifically, section 45 CFR 46.101(b)(2) states:

> (b) Unless otherwise required by Department or Agency heads, research activities in which the only involvement of human subjects will be in one or more of the following categories are exempt from this policy:
>
> **Category (2) of 45 CFR 46.101**, research involving the use of educational tests (cognitive, diagnostic, aptitude, achievement), survey procedures, interview procedures or observation of public behavior, unless: a) Information obtained is recorded in such a manner that human subjects can be identified, directly or through identifiers linked to the subjects; and b) any disclosure of the human subjects' responses outside the research could reasonably place the subjects at risk of criminal or civil liability or be damaging to the subjects' financial standing, employability, or reputation.

In addition, your application to waive documentation of consent, as indicated in your **Application for Waiver or Alteration of Informed Consent Procedures** form has been **approved**.

Your research must be conducted according to the proposal that was submitted to the IRB. If changes to the approved protocol occur, a revised protocol must be reviewed and approved by the IRB before implementation. For any proposed changes in your research protocol, please submit a **Request for Modification Form** to the GPS IRB. Because your study falls under exemption, there is no requirement for continuing IRB review of your project. Please be aware that changes to your protocol may prevent the research from qualifying for exemption from 45 CFR 46.101 and require submission of a new IRB application or other materials to the GPS IRB.

A goal of the IRB is to prevent negative occurrences during any research study. However, despite our best intent, unforeseen circumstances or events may arise during the research. If an unexpected situation or adverse event happens during your investigation, please notify the GPS IRB as soon as possible. We will ask for a complete explanation of the event and your response. Other actions also may be required depending on the nature of the event. Details regarding the timeframe in which adverse events must be reported to the GPS IRB and the appropriate form to be used to report this information can be found in the *Pepperdine University Protection of Human Participants in Research: Policies and Procedures Manual* (see link to "policy material" at http://www.pepperdine.edu/irb/graduate/).

6100 Center Drive, Los Angeles, California 90045 ▪ 310-568-5600

Please refer to the protocol number denoted above in all further communication or correspondence related to this approval. Should you have additional questions, please contact me. On behalf of the GPS IRB, I wish you success in this scholarly pursuit.

Sincerely,

Doug Leigh, Ph.D.
Chair, Graduate and Professional Schools IRB Pepperdine University
Graduate School of Education & Psychology
6100 Center Dr. 5th Floor
Los Angeles, CA 90045
Doug.Leigh@pepperdine.edu W: 310-568-2389
F: 310-568-5755

cc: Dr. Lee Kats, Vice Provost for Research and Strategic Initiatives
Ms. Alexandra Roosa, Director Research and Sponsored Programs
Dr. Margaret Weber, Graduate School of Education and Psychology

APPENDIX D

Raw Data

The Excel spreadsheet consists of 609 rows x 142 columns: That is 192 pages of data. For obvious reasons, I am disinclined to include it here. It is a 440k file. I will make it available to anyone who wants it for analysis purposes. Please email me with your request: richard.okeeffe@pepperdine.edu

APPENDIX E

Complete Chi-Square Data

Table 14.
Do you use email?

	X2	Sig.
Use email	.78	.38

N=604

Table 15.
Email Device Preference

	X2	Sig.
Email using laptop	2.97	.09
Email using desktop	.57	.45
Email using notebook	.26	.61
Email using tablet	1.07	.30
Email using cellphone	2.61	.11
Email using smartphone	2.74	.10

N=601

Table 16.
Email Frequency Chi-Square Tests

	X2	Sig.
Email frequency	6.92	.031

N=601

Table 17.
Do You Text

	X 2	Sig.
Do You Text?	1.84	.18

N=604

Table 18.
Texting Device Preferences

	X2	Sig.
Text using laptop	.73	.39
Text using desktop	.28	.60
Text using notebook	2.49	.12
Text using tablet	2.26	.14
Text using cellphone	2.41	.12
Text using smartphone	5.37	.02

N=540

Table 19.
Texting Frequency

	X2	Sig
Text Frequency	12.90	.00

N=540

Table 20.
Do You Use the Internet

	X2	Sig.
Do You Use Internet?	.26	.61

N=604

Table 21.
Internet Use Device(s) Preferences

	X2	Sig.
Internet using laptop	.68	.41
Internet using desktop	1.05	.31
Internet using notebook	.35	.55
Internet using tablet	.55	.46
Internet using cellphone	1.00	.32
Internet using smartphone	3.43	.06

N=603

Table 22.
Internet Use Frequency

	X2	Sig.
Internet Use Frequency?	.12	.94

N=603

Table 23.
Search for Directions Online

	X2	Sig.
Search for Directions Online??	.56	.45

N=605

Table 24.
Search Directions Device Preferences

	X2	Sig.
Get Directions using laptop	.00	.95
Get Directions using tablet	.02	.89
Get Directions using desktop	.93	.34
Get Directions using notebook	1.74	.19
Get Directions using cellphone	.15	.70
Get Directions using smartphone	5.99	.01

N=595

Table 25.
Search Directions Frequency

	X2	Sig.
Search for directions frequency?	1.06	.59

N=595

Table 26.
Make Purchases Online

	X2	Sig.
Make Purchases Online??	.32	.57

N=602

Table 27.
Purchases Online Device Preference

	X2	Sig.
Buy Online using laptop	.01	.91
Buy Online using notebook	.04	.84
Buy Online using smartphone	.01	.92
Buy Online using desktop	.16	.69
Buy Online using tablet	.16	.69
Buy Online using cellphone	.17	.68

N-596

Table 28.
Purchases Online Frequency

	X2	Sig.
Online purchase frequency?	6.52	.04

N=596

Table 29.
Look Up Medical Information

	X2	Sig.
Look Up Medical Info?	.04	.84

N=604

Table 30.
Look Up Medical Info Device Preference

	X2	Sig.
Med Info using tablet	.00	.98
Med Info using laptop	.06	.81
Med Info using desktop	.84	.36
Med Info using notebook	.44	.51
Med Info using cellphone	.62	.43
Med Info using smartphone	.13	.72

N=564

Table 31.
Look Up Medical Info Frequency

	X2	Sig.
Look up Medical Info Frequency?	2.9	.24

N=564

Table 32.
Bank Online?

	X2	Sig.
Bank Online??	5.52	.02

N=605

Table 33.
Bank Online Devices

	X2	Sig.
Bank using cellphone	.00	.97
Bank using laptop	.17	.69
Bank using desktop	.91	.34
Bank using notebook	.82	.37
Bank using tablet	.39	.53
Bank using smartphone	.17	.68

N=547

Table 34.
Bank Online Frequency

	X2	Sig.
Bank online weekly	.04	.98

N=547

Table 35
Pay Bills Online

	X2	Sig.
Pay Bills Online	2.07	.15

N=600

Table 36.
Online Bill Pay Device Preference

	X2	Sig.
Pay Bills using cellphone	.03	.86
Pay Bills using smartphone	.00	.97
Pay Bills using laptop	.73	.78
Pay Bills using desktop	1.67	.19
Pay Bills using notebook	.79	.37
Pay Bills using tablet	.30	.58

N=535

Table 37.
Online Bill Pay Frequency

	X2	Sig.
Online bill pay frequency?	.59	.74

N=534

Table 38.
Play Games Online

	X2	Sig.
Play Games Online	.03	.88

N=607

Table 39.
Online Gaming Device Preference

	X2	Sig.
Gaming using cellphone	.00	.98
Gaming using laptop	.44	.51
Gaming using desktop	.35	.56
Gaming using notebook	.14	71
Gaming using tablet	.48	.49
Gaming using smartphone	2.79	.10

N=341

Table 40.
Online Gaming Frequency

	X2	Sig.
Online gaming frequency?	4.16	.13

N=340

Table 41.
Read News Online

	X2	Sig.
Read News Online	.00	.99

N=607

Table 42.
Read News Online Device Preference

	X2	Sig.
Read News using desktop	.04	.84
Read News using cellphone	.00	.97
Read News using laptop	.36	.55
Read News using notebook	.26	.61
Read News using tablet	1.30	.26
Text using smartphone	.10	.75

N=550

Table 43.
Read News Online Frequency

	X2	Sig.
Read news online frequency?	2.27	.32

N=550

Table 44.
Check Weather Online

	X2	Sig.
Check Weather Online	.35	.56

N=602

Table 45.
Check Weather Online Device Preference

	X2	Sig.
Check Weather using laptop	.19	.67
Check Weather using desktop	.75	.39
Check Weather using tablet	.25	.62
Check Weather using cellphone	.97	.33
Check Weather using smartphone	3.83	.05

N=574

Table 46.
Check Weather Online Frequency

	X2	Sig.
Internet Use Frequency?	.85	.64

N=574

Table 47.
Read Blogs

	X2	Sig.
Read Blogs	1.20	.27

N=607

Table 48.
Read Blog Device Preference

	X2	Sig.
Read Blog using laptop	.08	.77
Read Blog using desktop	1.21	.27
Read Blog using notebook	1.26	.26
Read Blog using tablet	.56	.46
Read Blog using cellphone	1.78	.18
Read Blog using smartphone	.52	.47

N=277

Table 49.
Read Blog Frequency

	X2	Sig.
Read Blog Frequency	.40	.82

N=277

Table 50.
Write Blog

	X2	Sig.
Write Blog?	1.50	.22

N=602

Table 51.
Write Blog Device Preference

	X2	Sig.
Write blog using smartphone	.03	86
Write blog using laptop	.62	.43
Write blog using desktop	.43	.51
Write blog using notebook	.92	.34
Write blog using tablet	.23	.64
Write blog using cellphone	.17	68

N=56

Table 52.
Write Blog Frequency

	X2	Sig.
Write Blog Frequency?	2.09	.35

N=56

Table 53.
Save Online Bookmarks

	X2	Sig.
Save Online Bookmarks	2.60	.11

N=605

Table 54.
Bookmark Saving Device Preference

	X2	Sig.
Bookmark using laptop	1.92	.17
Bookmark using desktop	.68	.41
Bookmark using notebook	1.62	.20
Bookmark using tablet	.11	.74
Bookmark using smartphone	.41	.52

N=470

Table 55.
Bookmark Saving Frequency

	X2	Sig.
Bookmark Saving Frequency?	7.49	.02

N=467

Table 56.
Take Online Classes

	X2	Sig.
Take Online Classes	7.49	.01

N=605

Table 57.
Take Online Classes Device Preference

	X2	Sig.
Online class using notebook	.02	.88
Online class using laptop	.51	,48
Online class using desktop	1.36	.24
Online class using tablet	2.15	.14
Online class using cellphone	0	0
Online class using smartphone	.45	.50

N=201

Table 58.
Online Classes Frequency

	X2	Sig.
Online Classes Frequency?	.91	.63

N=201

Table 59.
Search Recipes Online

	X2	Sig.
Search Recipes Online	.37	.55

N=602

Table 60.
Search Recipes Online Device Preference

	X2	Sig.
Recipe search using laptop	.04	.84
Recipe search using notebook	.03	.87
Recipe search using desktop	1.09	.30
Recipe search using tablet	.55	.46
Recipe search using cellphone	.25	.62
Recipe search using smartphone	2.31	.13

N=497

Table 61.
Recipe Search Frequency

	X2	Sig.
Recipe Search Frequency?	2.31	.32

N=497

Table 62.
Visit Online Social Networks

	X2	Sig.
Visit Online Social Networks	.12	.73

N=603

Table 63.
Visit Online Social Networks Device Preference

	X2	Sig.
Social network using notebook	.03	.86
Social network using tablet	.01	.93
Social network using laptop	.70	.40
Social network using desktop	.21	.65
Social network using cellphone	.12	.73
Social network using smartphone	1.72	.19

N=435

Table 64.
Visit Online Social Networks Frequency

	X2	Sig.
Visit Online Social Networks Frequency?	.12	.94

N=435

APPENDIX F

Email Requesting Survey Participation

April 2013

Dear Fellow Trilogy Resident,

How would you like to be included in a drawing for a $100.00 Gift Card for participating in a 17 question survey?

I am Richard O'Keeffe. My wife Georgi and I live in Trilogy at the Vineyards in Brentwood, California. I am completing my doctorate degree (Ed.D.) in educational technology from Pepperdine University. As part of my degree, I am researching baby-boomers to determine the extent of our digital literacies.

Our old-school literacies - the three "r's: readin' 'ritin'' and 'rithmetic –were the literacies we needed growing up. Now new digital literacies are necessary for thriving in todays' digital society: Tap, Swipe and Pinch.

We boomers are becoming senior citizens at a rate of nearly 10,000 per day and we will continue this for the next 17 years! Typically, senior citizens are not technology-savvy. Are we "typical" senior citizens? Do we understand all things digital enough to get by? Do we know enough about our digital device driven society to thrive? Do we know enough …

The question I am asking is to what extent are we using digital devices and digital media in our daily lives? I am writing to ask for your help. I am asking for volunteers to take a few minutes to take my short survey.

My research includes a 17 three-part-question survey. It's basically: Do you ____ ? How often? and using what device(s)? This is University-sponsored research and I am being supervised by the Dean of the Graduate School, Dr. Margaret Weber.

I respect your privacy. Your identity will not be requested on the survey. The survey asks some basic demographic questions to group you by year born and other baselines. None of your responses will be available to anyone except me and I will be unable to identify you. The survey will be available online or via USPS mail and there are NO identifying questions! Findings will be available to all who request them. Requests may be sent to my email address or you may phone me directly. Please DO NOT request on the survey itself. Remember: no identifying information should be on the survey! Also, I am offering an abridged version of my research findings for publication in My Trilogy Life.com

I plan to schedule the survey during May.

OK, so this helps me. Now, what's in it for you? As a "thank you", I am offering a $100.00 Gift Card to each participating Trilogy community to be awarded by a drawing to a randomly chosen participant of the survey. I will coordinate with staff at each community to ensure a fair drawing among survey participants.

There are only two requirements to participate in my survey: 1) you must be a baby-boomer (born between 1946 and 1964) willing to indicate the year of your birth on the survey and 2) you must be a Trilogy resident. You may choose what media in which you would be willing to take the survey (postal

mail, email, online [web link to survey site]). There are no expenses to you and you are free to discontinue the survey at any point should you so decide.

Participants will be randomly selected from the pool of all volunteers. To volunteer, contact me by phone (925-699-7001), mail (Richard O'Keeffe, 1121 Medoc Ct, Brentwood, CA 94513), or email (richard.okeeffe@pepperdine.edu). Volunteers must notify me prior to April 30, 2013.

If you have any questions about this survey, please feel free to contact me and I will provide whatever additional information you request.

Thank you for considering to participate!

Richard O'Keeffe

APPENDIX G

Copyright Permission

From: Horace Dediu [SMTP:HORACE.DEDIU@ASYMCO.COM]
Sent: Sunday, September 21, 2014 1:58:35 PM
To: O'Keeffe, Richard (student)
Subject: Re: Chart use & copyright
Importance: High
Auto forwarded by a Rule

I have no objections to academic use of my work. You have permission to use charts from my site.

On Sep 19, 2014, at 4:38 PM, O'Keeffe, Richard (student) <Richard.OKeeffe@pepperdine.edu> wrote:

Hello!

I have recently completed my dissertation @ Pepperdine (Baby Boomers and Digital Literacy) and am presently involved in final APA Review. Two charts I included were originally published by 1) Forbes and 2) New York Times. Both are copyright protected and managed by PARS, International and I am being told that I may be required to pay some copyright fees because my dissertation will be published, searchable and citable, reasons PARS deems NOT freely citable.

I am writing to you because your chart from Nov. 18, 2013 “Seeing What’s Next” is very similar and would enable me to replace the other two with it. My intent with the chart is to demonstrate the rates of diffusion of technology. Your chart clearly accomplishes that!

My question: what are your requirements re: academic use of material from your writings? May I have your permission to use the chart included in that article?

Respectfully,

Richard J. O’Keeffe
richard.okeeffe@pepperdine.edu