Digital Age:

A Study of Older Adults' User Experiences with Technology

Dissertation Prospectus

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Introduction: Aging Populations and Technology

"To YAHOO, 701 First Avenue, Sunnyvale, CA 94089.

Dear Sirs: I am seeing RED. After 3 days of trying to change my e-mail with your organization with no success I am appealing to Corporate to solve my problem: I recently moved to a senior independent living apartment from my home. I no longer am able to use my former email (grandmarose31@comcast.net) as they do not service this place for free. My new email is grandmarose31@aol.com. I have a very 'DUMB' phone that does not accept text messages as I have had problems with bad calls So as a result your security won't allow me to make the necessary change in my e-mail. At 83 years old, I am quite able to talk with a representative which is now impossible. Of all the doctors, lawyers, companies, hospitals, and etc. you are the only company that is so unreachable by 'DUMB' phone. Please help me to resolve this problem as soon as possible as I would like to participate in your services before I die. Computers are fine but sometimes a person that 'talks' is important.

Sincerely,
Rose Jenkins[1]
PS I am on FACEBOOK if security really wants photo ID"

Above is the transcript of a letter typed and printed in red ink (she was "seeing red," after all) by an 83-year-old woman after she was locked out of her Yahoo! account for too many failed login attempts. By her generation's standards, Rose was incredibly computer-savvy—her expertise with email, desktop publishing and photo editing software, social media, Kindle tablets, and video chat made her an important source of go-to tech support for other elders in her senior apartment community—but she hit a seemingly insurmountable roadblock when Yahoo! required her to unlock her account with a code sent by text. It is widely known that older adults aged 65+ are the least likely age cohort to use smartphones or the internet, and that this phenomenon increases significantly with each decade of age (Poushter, 2017), but as a technologically proficient older adult user, Rose's situation is still puzzling. Why didn't she seek out another option, like text-based web chat with a customer service representative, to regain access to her account?

The differences in technology adoption and use between younger and older adults are shaped by several complex, interconnected factors. While biomedical technology increasingly prolongs the lifespan of American adults, elders still lag in their adoption of other digital tools and interfaces. These technology use patterns have been attributed to elders' physical challenges, skeptical attitudes, and learning or support difficulties when attempting to try new tech (Smith, 2014).

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[1] Rose's name (and email addresses), as with all others used in the write-ups of this research, is a pseudonym. I let participants select their own pseudonyms for this project—some elected to, while others did not (so I generated an alias for them).

Rose's situation sheds light on another issue that affects technology designers and technical communicators who create interfaces used by different age cohorts, though: that of cultural and generational differences. Design is cultural, and the affordances and limitations of an interface reflect specific, situated cultural assumptions about what users can or cannot, should or should not do (Selfe & Selfe, 1994). In Rose's case, the assumptions are that 1) most or all users will have access to SMS to receive numerical codes to unlock their account, and 2) those who are unable to or do not want to receive SMS will be able to or are comfortable messaging a support representative through an in-browser text chat. Rose, who grew up in the golden age of telephony, finds speaking with a representative more personal (and thus more comfortable and safer) than exchanging account details with an "invisible" person she can neither see nor hear—hence the letter of complaint. This is an issue of cultural and generational user experience.

Scenarios like these are expected to become more and more common in decades to come. The "graying of America" is a well-documented phenomenon (Anderson & Hussey, 2000; Bloom et al., 2011; Gavrilov & Heuveline, 2003; Mather, 2016; Olshanksy et al., 2009), with older adults expected to outnumber children by 2035 (Vespa, 2018). Because the growth of the older adult population is set to outpace that of younger generations, and because this age cohort is the one with the lowest current rate of technological adoption, it should be a critical area of research for technical communicators: but there has been little previous inquiry into writing and design for older adults. While some work has been done in human-computer interaction (HCI) and user-experience design (UX) looking at the differences in technology use and habits that mark older generations, there have not been localized or phenomenological studies that examine the technology use of individual users, or that highlight their reflections about their own technology use and analyze that data for patterns of insights. Rose's senior living apartment facility—which is located in The Villages (FL), the United States' fastest growing retirement community—presents one excellent site for researching older adults interacting with their computers (and other devices, like, tablets, smartphones, feature phones, and virtual assistants) in their own homes, conducting contextual inquiry to better understand their technology adoption, habits, desires, motivations, problems, barriers, and usage.

Statement of the Problem

The United States' shifting population pyramid poses unique problems and opportunities, for both technical communication scholars and practitioners. Older adults[2]—defined most broadly as those aged 50 or above—are the fastest growing segment of the American population. One out of nine Americans is 65 or older, and these numbers are projected to steadily increase as the nation's fifty million Baby Boomers reach retirement age over the coming decades (Pirkl, 2009). However, this phenomenon is not only limited to the US: "by 2020, it is expected that over one billion senior citizens will be alive on the planet" (Sibley, 2008).

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[2] "Senior citizens" or "retirees" are perhaps more common terms used to describe this group in American media and society, however both terms are fraught with connotations that stereotype the identities and experiences of this incredibly diverse population. "Retirees" in particular is problematic because of the increasing numbers of older adults who must continue to work for pay in order to support themselves and/or their families. For these reasons, I choose to use the terms "older adults" or "elders."

In a rapidly "graying" nation and world, communicators and designers should attend to age, and the many material and cultural dimensions that accompany it, when creating user experiences. Those who research and teach technical communication should also be cognizant of the shifting needs and habits of user populations, particularly when presented with such an exigency as the imminent retirement of the country's largest generational segment. This is why I propose a project that combines qualitative interview data, broad observational insights, and specific, task-oriented analysis of older adults' interactions with computer and internet technologies

Research Questions

1. What does "everyday" computer and internet use look like for older adults living in a residential senior community in central Florida?
2. What are the goals and purposes for computer and internet use articulated by older adults in this community? What intrinsic and extrinsic motivations shape these goals and purposes?
3. What factors (material, infrastructural, embodied, cognitive, cultural, design, etc.) help or hinder older adults from realizing their technological goals?
4. What recommendations can be generated for a more inclusive experience architecture, given this age cohort's experiences and reflections on technology?

Review of Literature

The academic discipline that theorizes and researches older adults and their experiences is called *aging studies* or *gerontology*[3]. While aging studies research is largely conducted by medical doctors or social scientists, humanities scholars have begun to enter the conversation over the past decade to contribute valuable knowledge and research about "identity, difference, and cultural value" (Port & Swinnen, 2014) across an aging population. There is a definite dearth of scholarship on aging studies within both rhetoric & composition and technical & professional communication, with fewer than five scholars (Crow, 2002; Lippincott, 2004; O'Hara, 2004) focusing on the aging experience in both disciplines. There is a clear exigency for this work within writing studies writ large, but within technical writing in particular, given older adults' status as technology users: they have larger amounts of free time and discretionary income compared to younger users, but the gap between them and younger cohorts still persists (Norman, 2019).

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[3] Based on my experience in gathering and analyzing sources for this work over the past four years, I've concluded that there is a disciplinary—and perhaps also epistemological—divide between aging studies and gerontology. Gerontology, an older term with its roots in Greek, was born out of human medicine and the hard sciences; thus, it typically refers to biological or medical studies of the aging process. Aging studies, on the other hand, is more of a social scientific term that encompasses theoretical, empirical, and critical research on aging populations and the *experience* of aging (see the editorial scope position of the *Journal on Aging Studies* for more on this: http://www.journals.elsevier.com/journal-of-aging-studies/). While this is not a hard and fast distinction, I still tend to use the terms "age studies" or "aging studies" because of my critical orientation towards existing theories and attitudes about the aging process and experience.

This review of literature explores aging research focusing on computing, digital literacies, and experience architecture (Potts & Salvo, 2017) from across disciplinary perspectives. These pieces compose three interconnected threads that form a preliminary literature review for my proposed project exploring the user experiences of older adults: first, existing work in technical communication that articulates the need for work with older adults in the discipline (Crow, 2002; Lippincott, 2004), as well as providing recommendations for creating accessible websites for this population (Chisnell, Redish & Lee, 2006; O'Hara, 2004); second, user studies and design recommendations from human-computer interaction (HCI) and user experience (UX), which examine specific interfaces (Brajnik & Giachin, 2014; Kang & Yoon, 2008; Roberts et al., 2011) and give lists of best practices for designing for aging minds and bodies (Campbell, 2015; Chadwick-Dias, McNulty & Tullis, 2003; Finn, 2013; Johnson & Finn, 2017; Wilkinson & Gandhi, 2015); and third, a body of critical theoretical work from rhetoric and composition, which describes changes in literacies across age (Bowen, 2011; Brandt, 2001; Rumsey, 2009) and the computer and internet literacies of the elderly (Bowen, 2012; Selfe & Hawisher, 2004: McKee & Blair, 2006). The conversations across these three thematic areas ground my proposed empirical study that examines the user experiences of a population of adults aged 65+ living in a central Florida retirement community, framing a clear gap in the literature around localized studies of specific communities of older adult users that take into account the complex computing contexts, purposes, and interfaces of a world marked by Web 2.0 and media convergence (Jenkins, 2006).

Age and Older Adults in Technical Communication Scholarship

Despite the country's shifting age demographics—and, consequently, the shifting demographics of technology users—technical communication research still fails to account for age as a component of identity and a factor that affects technology adoption and use. The field typically focuses its inquiry on 1) students in undergraduate programs and 2) the communication work of academics and practitioners in their workplaces, before old age and/or retirement. In 2004, Gail Lippincott asked in the *IEEE Transactions on Professional Communication*, "Where are the Technical Communicators in Research and Design for Aging Audiences?" Since then, there has been some work from human-computer interaction and user experience (UX) addressing the needs of aging users, but very little research from technical communicators, even though technical communication scholars and practitioners are uniquely situated to address issues of difference and access shaping the adoption of digital technologies.

Lippincott's 2004 *IEEE* article functions as both a rallying cry and a manifesto—she both emphasizes the importance of integrating age into technical communication research and outlines four key considerations guiding the work that the discipline needs to do to investigate aging. These considerations are…

1. Refining age as a "demographic variable," to understand the nuance and complexity that mark different age cohorts, as well as the intersecting facets of identity that mediate the aging experience;

2. Integrating age with other "variables of audience analysis," namely through inclusion of older adults in experience design and testing;

3. Familiarizing ourselves with multidisciplinary aging research to better address the needs of older adults; and

4. Collaborating with interdisciplinary and international colleagues to conduct aging research that is inclusive and equitable (Lippincott, 2004, pg. 157).

Lippincott's work followed a *Technical Writing and Communication* article by Angela Crow (2002), which mapped the challenges faced by older adults in "accumulating technologies and literacies," providing a focal example in "Corretta Smith," a 65-year-old Black woman in rural eastern Georgia who met with Crow at the local library to develop reading skills in hopes of beginning technology training. As a case study, Corretta Smith demonstrated how the inequalities of a generational digital divide could be compounded and magnified by classed, raced, and gendered divides as well. Taken together, Lippincott's and Crow's articles from the early 2000s form the foundation for intersectional inquiry into age in technical communication: but they have not been followed by additional studies examining elders' technology use *in situ*, or case studies examining the interfaces commonly used by members of older age cohorts.

Little work on age or aging has been published in technical communication since Lippincott's manifesto was written over ten years ago. In a report created for the AARP, usability specialists Chisnell, Redish & Lee (2006) identify and expound upon "usability and design issues common to older users" by creating heuristics, personas, and tasks for website review and rating. They offer a four-point heuristic for classifying users (age, ability, aptitude, and attitude), as well as a thorough list of considerations for visual design, interaction design, and information hierarchy, design, and architecture. O'Hara's (2004) *Technical Communication Quarterly* article "Curb Cuts on the Information Highway" again describes "communication impairments" experienced by older users, before detailing accessibility initiatives aimed at closing the "digital divide" for older users and concluding with analyses of three websites designed specifically for elderly populations: seniornet.org, aarp.org, and seniors-site.com. O'Hara's article is noteworthy in that it is the only one available that describes cultural influences that affect internet use by the elderly, identifying ageism and "technophobia" (or luddism) as two key factors for communicators and marketers to consider.

This existing work is limited in scope and application. These three technical communication articles were written over ten years ago, before the advent of Web 2.0—thus, it fails to account for newer technologies that have impacted our digital landscapes and cultures, such as smartphones, social media, and virtual assistants. They do not detail the results of empirical studies, but rather present theoretical perspectives and decontextualized best practices or recommendations. Finally, in these pieces age is often conflated with or reduced to disability and, as a consequence, older adult populations are viewed by designers and communicators according to a deficit model. While it is certainly important to consider the impacts that aging bodies—eyes, ears, hands, fingers, minds—have on elders' technology use, declining motor and cognitive abilities are not the only factors that affect usage for older age cohorts. What's more, if

we reduce elder users to their "impairments," we risk stereotyping them in ways that curtail design possibilities, as well as these users' possibilities for full participation in digital life.

Education helps enable greater participation for elders in digital activities and spheres. Technical communication scholarship focusing on community technology centers (CTCs) has also broached age as a category of analysis. Rachel Tofteland-Trampe's (2017) recent work addresses the lack of access and differing cultural systems of meaning that affect older adults' uptake of digital technologies, thus encouraging them to seek out courses or training at a CTC. Tofteland-Trampe extends and expands upon McKee & Blair's (2007) earlier work, which analyzed community literacy programs specifically designed for older adults in the early 2000s. While these studies contribute valuable knowledge for working with aged populations in an educational context, they focus primarily on the cultivation of digital skills, rather than older adults' rationale for developing those competencies, or the design features and pedagogical practices that make them possible. None of the previous work in technical communication (or rhetoric and composition) looks explicitly at retirement communities or senior centers as sites of research, instead focusing on libraries or community enrichment programs, or recruiting participants independent of their communities altogether.

User Experience (UX) and Human-Computer Interaction (HCI) Scholarship on Older Adults

While technical communication has largely failed to take up Lippincott (2004) and Crow's (2002) call to generate data and recommendations on older adults' technology use, computer scientists have conducted research to fill this critical gap, publishing work on older users' habits and comparative studies on the usage practices of different age cohorts. Researchers within user experience and its related fields of information design and human-computer interaction have been examining older adults' interactions with a variety of technologies for the past decade or so. These studies have primarily focused on the differences between older and younger adults' learning and use of technology, from personal media players (Kang & Yoon, 2008), to digital thermostats (Brajnik & Giachin, 2014), to GPS interfaces (Roberts et al., 2011). The majority of these studies focus largely on differentiating between the needs of adults in different age segments, rather than examining the everyday use of technology by adults of a certain age category. As a result of this research, as well as the observations of practitioners in the field, user experience leaders have begun developing "best practice" resources for designing for older users (see Campbell, 2015; Chadwick-Dias, McNulty & Tullis, 2003; Finn, 2013; Johnson & Finn, 2017; Wilkinson & Gandhi, 2015).

A handful of studies exist from human-computer interaction (HCI) and related design fields that offer insight into older adults' use of particular devices and technologies. One such study, articulated by Kang & Yoon (2007) systematically investigates the differences between young (20–29 years old) and middle-aged (46–59 years old) adults' interactions with "complicated electronic devices:" an MP3 player and "personal media player" (PMP) that combines the functions of radio, audio, and video players (Kang & Yoon, 2007, p. 425–427). While Kang & Yoon's research demonstrate that increases in age also significantly increase the frequency of errors and numbers of interaction steps (or "clicks") made by users of these devices, not all instances of "negative" or "improper" device use were influenced by the age of the user. For

example, trial-and-error behavior in an attempt to learn how to work the device, as well as general frustration levels with unwanted results, were more closely correlated with low background knowledge of the technology than with old age. Kang & Yoon's study illustrates the influence that background knowledge and previous experience has in reducing older adults' stress around and misuse of digital technology, demonstrating how appropriate and useful documentation and continued education around new technologies is crucial for older age cohorts.

Media convergence (Jenkins, 2006) can often prove confusing for older adults, according to Kang & Yoon; the combination of multiple functions into one device—such as an MP3 player that plays back music *and* video, or a smart TV that provides many apps and experiences in one (like that of a cable box, a stereo, a gaming system, and a DVD player)—can be overwhelming to older users. "The expertise of older adults declines when they are confronted with new domains of familiar tasks… older adults seem to lack mental and physical flexibility; so they cannot easily apply known operation methods to the use of a new device" (Kang & Yoon, 2007, p. 434). Industrial engineers Roberts et al. (2011) identify similar difficulties with in-dash automobile navigation and user interface systems—difficulties not only along generational lines, but also across the gender divide[4]. Women, and older women in particular, consistently performed fewer tasks in the task analysis, and rated the understanding and enjoyment of the in-dash system lower than their male counterparts. However, age did not significantly affect the number of tasks completed; and the research team identified the training that they provided to participants prior to the product test as a crucial determinant of this task completion success. Again, education on new technologies and increased familiarity with digital interfaces is a major component of not only older adults' user experience satisfaction, but *all users' satisfaction*.

Another potential way to address the differences in user experience between age cohorts during the product research and development phase is through sketches and storyboards, or other prototyping methods, according to Brajnik & Giachin (2014). Unlike other authors highlighted in this literature review, these scholars acknowledge that "factors that improve the quality of interaction for younger users are likely to overload older adults" (Brajnik & Giachin, 2014, p. 564). Designers may be acting at cross-purposes when attempting to create interfaces that cater to a wide range of ages, but can gauge user ease of navigation and satisfaction through a sketch or storyboard evaluation that focuses on specific design factors. This approximates the experience for user research participants, and it can also be enacted early enough in the design and development process that major reworking of the prototype can be done without great monetary or time costs.

In satisfying the ultimate aim of creating a more holistic user experience design framework for not just older adults, but all categories of users, Brajnik & Giachin outline the many different dimensions of user experience that designers must attend to. From affective elements like emotion, to socio-cultural dimensions of persuasion and acceptability, to cognitive factors, to aesthetic preferences (Brajnik & Giachin, 2014, 553–554), these researchers offer a concise yet

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[4] It is not my intention to reinforce a reductive gender binary here; I recognize gender as a diverse spectrum, but the research team of Roberts et al. (2011) identify gender along a male/female binary for the purposes of this paper, likely due to participants' self-identification.

comprehensive review of not only the considerations that ought to go into interaction design, but also the barriers that may arise when attempting to satisfy these aims (Brajnik & Giachin, 2014, 554).

While the studies conducted by user experience researchers and computer scientists that foreground age and aging have provided useful data, initiating conversations about best practices for designing for this population, the work here is often uncontextualized or dehumanized—it fails to take into account users as holistic, multifaceted *people*. This research involves *subjects* from whom data is collected, not *participants* who are actively engaged in research. Researcher subjectivity is not acknowledged, much less reflected upon in these studies. Personhood and aspects of identity are removed from this work, giving the data quantitative rigor, but removing generative details of context and story. One clear benefit of doing work with older adults is its narrative quality: UX researchers Sanders & Stappers (2012) note in their book *Convivial Toolbox* that researchers should "plan on sessions with the elderly to take up twice as long as sessions with younger people," (pg. 104) because of elders' wealth of experience and ample free time for sharing. Because of this lack of compelling illustrations of trends detailed in research data—as well as its removal of the human element in user experience—human-computer interaction work can benefit from triangulation through localized, phenomenological inquiry.

Research and Advocacy around Old Age in Composition and Literacy Studies

Unlike technical communication, rhetoric and composition does have scholars with substantial bodies of work devoted to examining age and its effects on reading, writing, and communicating. A handful of scholars having published critical age scholarship (Bowen, 2011 & 2012; Crow, 2006; McKee & Blair, 2006; Rumsey, 20090; Rumsey et al., 2012; Teems, 2016 & 2018), largely from community-engaged and activist perspectives. A few of these researchers (Bowen, Rumsey, and Teems) have formed an informal working group investigating the intersections of writing and (old) age, publishing a special issue of *Literacy in Composition Studies* (LiCS) on "Composing a Further Life" in 2018[5]. However, there is no position statement from the College Conference on Composition and Communication (or any of its SIGS) on older adults or the development of literacy throughout the life course, nor is there any information about age or intergenerational learning available on such sites as the Bedford or Rebecca Moore Howard bibliographies[6]—in spite of the massive exigency surrounding the rapidly aging population both in the United States and in other nations. It is clear that this is an emerging area of research in the discipline, with many opportunities for research and growth.

Scholars in rhetoric and composition who have examined aging have primarily done so from a literacy studies tradition. Suzanne Kesler Rumsey's "heritage literacies" framework (2009) theorizes older adults' "adoption, adaptation, or alienation" of digital literacies, according to the norms of their communities and cultures. Literacy scholar Lauren Marshall Bowen (2011; 2012) speaks back to western culture's hidden "curriculum of aging," which sets assumptions, grounded largely in ideas of deficit and decay, for what it means to grow old in our society. This

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[5] Available at http://licsjournal.org/OJS/index.php/LiCS/issue/view/15
[6] Available at http://bb.bedfordstmartins.com/ and http://www.rebeccamoorehoward.com/bibliographies, respectively

work is largely critical in nature, "talking back" to preexisting assumptions of educational and workplace literacies and expanding the notion of literacy development throughout the life course.

Bowen cautions against stereotyping aging populations in her 2011 *College Composition and Communication* article. Studies of the literacies of older adults, she explains, must examine the literate lives of these individuals from multiple angles and perspectives, including not only psychological and cognitive aspects of literacy, but also affective and emotional experiences that either help or hinder literacy development (Bowen, 2011, p. 589). Because of the complicated nature of aging and the multifaceted nature of *literacies* (beyond a print/digital binary), Bowen ultimately cautions literacy scholars against simply adding age as an additional variable into their scholarship, or approaching older adults with the same frameworks and methodologies as one would other research participants. Instead, it is necessary to "...frame literacy studies as an exploration of literacy across the life course, including schooled literacies, workplace literacies, and the literacies developing beyond a full-time, wage-earning phase of life" (Bowen, 2011, p. 603).

Bowen's work on the continued development of elders' litera*cies* has challenged my ageist assumptions about the literate practices of this particular population. Her assertion that literacies develop not only across a youth, but across an entire lifetime, has helped me to frame a project that specifically explores the development of technological knowledge later in life. Bowen also examines older adults' technological literacies more closely in a later *College English* article (2012), which examines how the literature of AARP (the American Association for Retired Persons) reinforces or subverts a "curriculum of aging"—the collection of rhetorics imposing the cultural ideologies of old age. Bowen's case study describes what "technologies for seniors" are, as articulated by the largest and most powerful organization for older adults. These technologies are primarily "gerontechnologies" designed to assist or repair seniors' failing bodies. Bowen's analysis of AARP's print and digital educational and promotional materials yields a disproportionate emphasis on technologies of health and bodily repair, and few attempts to engage older adults in digital literacy development—a dearth that Bowen posits could be filled by a revaluing of the literate practices of older adults, and a reassessment of what we mean by "technological literacy."

Bowen's study provides several gaps that can be filled by an empirical analysis of older adults' technology use. What are "technologies for seniors," as articulated by older adults themselves? Why do they adopt some technologies (and digital literacies) and not others? How do they use and "hack" them? How do these tools reinforce or subvert the curriculum of aging for the older adults who employ them?

An additional framework for the continued development of literacies throughout the life course, approached from an historical perspective, is the "accumulation of literacy," described by Deborah Brandt (2001) in the third chapter of her book, *Literacy in American Lives*. Brandt chronicles the development and diversification of reading and writing skills of an American family, from the birth of their matriarch to a family of Norwegian immigrants at the turn of the

20th century, who wrote briefly as a stenographer and bookkeeper in the Midwest before returning to her roots as a farm-worker; to her son, who wrote for "civic and political participation" as an army officer in the second World War; to his son, who while initially averse to writing, eventually engaged in different types of literacy development when earning a degree in marketing and taking on a job as a courier. The chapter concludes with reflections on the great-grandchild engaging in sophisticated rhetorical education and critical thinking by participating in the Future Problem Solving Program, which teaches students how to write six-step plans for addressing technological, political, economic, and environmental problems (Brandt, 2001, p. 100).While Brandt describes the "echoes" of the child's great-grandmother inherent in his writing, she does not address the ways in which his learning or literate activities speak back to those of his elders. The accumulation of literacy, as she explains it, appears a very linear process, with earlier generations influencing or teaching later ones, with no apparent recursive activity or learning.

Suzanne Kesler Rumsey's *Composition and Communication* article provides a potential bridge between these ideas of intergenerational learning and older adults' literate lives, by describing multimodal literacy practices passed down through generations of Amish women in northern Indiana. Literacy practices, she explains, pass back and forth through generations of a community or culture: "the old inform the new, the new impact the old" (Rumsey, 2009, p. 577). This development and practice of "heritage literacy," which takes place outside of traditional scholarly learning settings, involves three potential actions: adoption or wholesale acceptance and approval of literacy practices, adaptation or reinterpretation of literacy practices, or alienation or total rejection of particular literacy practices. Rumsey specifically looks at how women within a particular family have adopted, adapted, or alienated themselves from "schooled" literacy practices, and also how members of her own family have adopted and adapted the Amish multimodal literacy practice of quilting.

While less related to *digital literacies* and more towards *intergenerational literacy practices*, Rumsey's heritage literacy framework nevertheless provides robust terminology and scaffolding for my project. The concepts of adoption, adaptation and alienation are key to my understanding of the reasons why older adults use or elect not to use particular social media tools. Heritage literacies affirms adoption, adaptation, *and* alienation *all* as legitimate forms of literate practice, grounded in cultural logics that researchers need to identify in order to understand reading, writing, communication, and design in communities. Rumsey's framework follows a strong tradition of advocacy work in writing studies—advocacy that pairs well with the user advocacy of technical communication and usability studies. By linking this respect for users and valuation of their usage practices with an understanding of information architecture and interface design, we can better understand older adults' experiences with technologies and accurately depict their user journeys.

Approach to Dissertation Project

This project employs both interview and observation methods, undergirded by feminist research methodology (Blair, Gajjala & Tulley, 2008; Koerber, 2000; Lay, 2002; Ramazanoğlu & Holland, 2002; Reinharz, 1992), to seek a deeper understanding of older adults' user experiences, and the major barriers that they face when completing their typical digital tasks. Consequently, I have completed two site visits to a retirement community to recruit participants, build relationships, gather data, and give back to those who have helped me with my research. This section first offers an overview of my data collection process, before explaining my plans for analysis.

The site for this research is the Sumter Grand, a supervised independent living apartment facility in The Villages, Florida. The Villages, a master-planned retirement community in central Florida, is a noteworthy site for research because of its status as the United States' fastest growing city—thanks to its steady influx of retirees since it was founded in the mid-1980s. Since 2010, the population has more than doubled, from 51,000 to over 114,000 residents (Rocco, 2015). The Villages is age-restricted, with residents typically aged 55+ and having a median age of 67.4 years (Dunne, 2018), but the Sumter Grand presents unique opportunities and challenges given the advanced age of its residents. As one of only two supervised living apartment facilities in the Villages—giving residents the opportunity to live independently without having to keep up a home, along with amenities like meal service and 24-hour security—the Sumter Grand offers Villagers of more advanced age an opportunity to stay in the community, while still receiving the support that they need to live semi-independently. The Grand is also located next door to a memory care and assisted living facility, providing residents the opportunity to move to a more supervised environment when needed. As such, residents mostly belong to the "old" (age 75–84) and "oldest old" (age 85+) age cohorts (Pirkl, 2009); the participants in this study ranged from 70–92, with an average age of 82.2. I recruited participants with a range of experiences with digital tools and interfaces, from self-described "techies" to individuals who had never used a computer, either because they wouldn't (they had no desire or need to learn) or couldn't (they had a disability that prevented them from doing so).

I have collected two sets of data over two separate site visits to the Grand. In March 2016, I conducted semi-structured interviews with 15 residents (as well as Marilyn, an employee of the Grand who serves as a resident liaison and occasional tech support). These interviews, ranging from 7 to 30 minutes in length, asked the participants to describe their computer and internet use, when and how they developed their computing skills, and the issues that they had recently with their devices and how they troubleshot those issues (interview questions available in Appendix A). All interviews were audio recorded and later transcribed.

In March 2018, I took a second trip to the Grand, this time to conduct two observations each with seven participants. The first observation, a more naturalistic/ethnographic approach, involved participants demonstrating their typical daily or weekly computer use while "thinking aloud" (Flower & Hayes, 1981; Nielsen, 2012) their processes and feelings as they interact with their device(s). The goal here was to get as close to a naturalized observation of the participants' computer use as possible, to see a representative slice of these older adults' digital lives. The

second observation employed structured task analysis methods (Hackos & Redish, 1998) to generate data on older adults' strategies for navigating unfamiliar computing situations and troubleshooting, as well as determining which design features help or hinder their interactions with digital interfaces. I asked 7 participants to think aloud their process and reactions as they completed a series of increasingly complex digital tasks. These tasks were…

1. Access the internet on your computer
2. Set up a new homepage for your internet browser
3. Find a news story of interest to you about world events
4. Determine the distance between your home and the nearest Kohl's store
5. Find a government document that answers the question, "how do I deduct medical expenses for transportation to and from doctor's appointments on my taxes?"[7]

I did not assist the participants in completing the tasks, but instead asked guiding questions and reminded them to explain to me how they felt, and how they would go about solving the issue if they were posed with a similar problem in real life. This session identified "pain points" for members of this population attempting to complete tasks using computers and the internet, and generated rich qualitative feedback from participants while doing so.

Both observations with each participant were video recorded, and a short exit interview was conducted to debrief participants' and answer their questions about the experience (observation protocol and exit interview questions in Appendix B).

The first stage of data collection for this study (the interview stage) was deemed exempt pursuant to Federal Regulations 45CFR46 (2) "tests, surveys, interviews, or observation" by Arizona State University's IRB (Study 00003938). The second stage of data collection (the observation stage) was given expedited approval under categories (6) and (7) by Purdue University's IRB (Protocol #1802020187); I am currently in the process of renewing this IRB protocol as of May 13, 2019. I may collect additional data on a specific problem or phenomenon after further analyzing the interview and observation data. If I do make another research trip, this will be in spring semester 2020.

Interview data for this project will be analyzed using verbal analysis methods, following Geisler's (2004) systematic coding method outlined in *Analyzing Streams of Language*. I have already transcribed the 16 interviews from March 2016, with transcripts totaling 95 pages of single-spaced data. The next steps will involve making decisions about segmenting and coding the data after reviewing it, and tracking patterns in the participants' technology use and user experience across the 16 interviews. I have already identified some preliminary themes for

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[7] My original IRB protocol included two additional tasks, but it became clear during the first two observations that the first five tasks were already taking up more time and posing more difficulty to the participants than I had originally anticipated. The tasks that I removed were "6. Register for an account on Pinterest.com and create a private board," and "7. Create and validate an account on Venmo.com." The members of the community did not express much interest in social media for a variety of reasons (which I plan to explore in Chapter 4 of my dissertation, the chapter on interview results), rendering the sixth task somewhat unnecessary. I intended the seventh task to test participants' ability to use their mobile phones for two-step verification, since older adults have the lowest adoption of smartphone and SMS technologies.

factors that influence these participants' technology adoption and use—physical, cognitive, educational, and cultural considerations—that I presented on at ATTW 2019 (Smith, 2019). I hope to deepen my understanding of these influences, as well as generate new ones that provide insights into elders' technological goals and difficulties.

The observation data for this project is not yet transcribed—I aim to transcribe both the verbal data and participants' screen data over the course of summer and beginning of fall semester 2019. I anticipate this transcription taking longer due to the complexity of the audiovisual data: to paint a complete picture of these interactions, it is necessary to transcribe the participants' words, their actions, what is going on with the interface(s) they are navigating, as well as contextual factors (where their technology is located in their home, if they are having difficulty that day due to influences like arthritis pain or tremors, if they need assistance from their spouse or neighbor to use their computer, etc.). I also have field notes that support and enrich the data from these recordings.

The data analysis will be similarly complex here, because of the diversity of tasks that these participants completed online during their first round observations (from online shopping, to interacting with patient portals for doctors' offices, to betting on horse races, to social networking), as well as the differing reactions to the assignments in the second round observations: there is a high level of variation in participants' experiences. I plan to conduct similar systematic coding (Geisler, 2004) with the verbal data from these sessions, while also employing task analysis methods (Hackos & Redish, 1998), namely task sequences and hierarchies (to explain how participants went about completing the five tasks from the second observation, as well as solving problems), user/task matrixes (compiled from aggregate data across the observations, to identify the most common activities that these participants engaged in online), and task scenarios for more detailed descriptions of observations that can serve as "focal examples" to illustrate particular difficulties or themes identified across the interview and observation data. An example of one of these cases is 82-year-old Holly's difficulty searching for information online[8]: she repeatedly typed search queries into her Gmail search bar (rather than a search engine or the address bar of her web browser) and worded them as though they were URLs (rather than keywords or phrases, e.g., *"www . why don't we have Donald Trump's tax returns . com"* rather than *"trump tax return news"*). When she did get to a search page from her email client, Holly was unable to differentiate between paid advertisements and legitimate search results, and got caught in a seemingly endless loop of sponsored search engine links (not actually finding an answer to her question). Transcribing the recordings from these sessions will help me to identify more moments like this one that illustrate the key themes I draw out from the data. Blythe's (2007) work on coding digital texts and multimedia will also guide the work here, especially in identifying the difference between manifest and latent content, or the literal meaning of participants' utterances and actions versus the emotions or motivations behind those utterances and actions.

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[8] I described this session in detail during the opening vignette for my 2019 ATTW presentation, available here: http://allegra-w-smith.com/conferences/

This work is primarily qualitative, though will also incorporate some basic quantitative analysis of the time it took participants to complete tasks, the number of sites they visited, the number of clicks to completion, etc. The data collection and analysis for this project combines rich, qualitative semi-structured interview responses with more targeted task analysis information and statistics because of the need for contextualization and humanization of user data. Popular methodologies in technical communication like actor-network theory (ANT) and new materialism (or object-oriented ontology) provide a framework for theorizing the relationships between objects in a human/technological system (Read & Swarts, 2015)—but, as I and others have argued previously (Smith, 2017; West-Puckett, 2017), ANT lacks the context to paint a complete picture of users' experiences in that system. Such methodologies fail to take into account epistemological, ontological, and ideological forces—such as Bowen's (2012) "curriculum of aging"—that shape human/technological assemblages. Put another way, material frameworks that only foreground the interactions of things function in the realm of explicit, physical actors (people, computers, applications, etc.), to the detriment of implicit, symbolic forces that also exercise control over human-technology interactions (race, class, gender, age, affect, history, etc.). This means that the experiences of users from diverse backgrounds are collapsed into a dominant (typically white, Euro-American, masculine) norm, with underrepresented groups either treated as an afterthought or ignored entirely. Because of this tension between the material and the cultural, I aim to integrate the two in this dissertation by using mixed-methods analysis. It is my goal to provide actionable findings about the user behavior and experiences of older adults here, without sacrificing critical contextual factors and socio-cultural influences (a tendency of flattening user experiences that has, in part, caused age to be overlooked as an influence of technology adoption and usage in the first place).

With this work, I aim to contribute to the field's understanding of users and their needs by creating heuristics for considering age, specifically old age, as a part of user research and evaluation. I hope to build upon the work published by practitioners in user experience (Finn, 2013; Wilkinson & Gandhi, 2015) by expanding the recommendations for designing for older populations, with a twin focus on the experiences of individual older adult users and the cultural assumptions, values, and experiences that are shared across older generations. The data that I collect and the guidelines that I provide could guide research in both academia and industry, as well as the creation of technologies specifically for elders both in the US and globally.

Proposed Chapter Summaries

Chapter 1: Introduction

This chapter will frame the project by first placing anecdotes from my interactions with research participants alongside current technological and cultural developments that establish the exigency for work in gerontechnology. This introduction will make a case for studying older adults' technology use through a feminist technical communication methodology, accounting for both the material and cultural elements of elders' user experiences to create a more complete and nuanced picture of this age cohort's interactions with technology. This introduction will forecast the work of the dissertation by providing an explanation of the need for research on older adult populations, as well as an overview of the study's research questions and structure.

Chapter 2: Literature Review

The second chapter supplies the theory and previous research that frames the work of the dissertation. This work will be divided into three sections, each covering an area of literature that informs the research that I've conducted and frames a critical gap that my work seeks to fill. The first section, on technical and professional communication (TPC), provides the history of calls for research on older adults in the field, and articulates why this dissertation work is most clearly situated within the TPC tradition. The second section, on UX and HCI research on older adults, will detail the results of previous research analyzing elders' interactions with specific interfaces, as well as comparative studies that identify the differences in user behavior between younger and older age cohorts. The final section, on rhetoric and composition research in the age studies tradition, will frame the community-engaged and activist work done on elders' literacies, describing efforts to recover and re-frame older adults' technology use as literate activity.

Chapter 3: Methods

After outlining the methods of data collection and analysis outlined above, the methods chapter will explain my guiding feminist research methodology and the considerations that emerge from this tradition[9]. I plan to describe the steps that I took during the research process to maximize benefit and minimize harm to the participants, providing examples of gaining access to the community and seeking the consent of its residents, reciprocal practice and gift-giving, participant observation, forming mutually beneficial researcher/participant relationships, rhetorical listening (Ratcliffe, 2005), and reflexively engaging with researcher subject position.

Chapter 4: Case Study

The first of three results chapters provides a deep dive into one specific participant's experiences and reflections across both rounds of data collection for the dissertation. 82-year-old Holly was one of only three individuals who participated in both interviews and observations for this project, and it's a noteworthy participant for her unique search habits and patterns, as well as the ways that her user behavior represented trends consistent across the study sample. Providing and analyzing the account of a single focal participant as an illustrative case before the aggregate data analysis for this dissertation is a critical methodological move for two reasons. First, it gives a sample user, or "persona" (Cooper, 1999; Friess, 2012; Miaskiewicz & Kozar, 2011) as a personalized and humanized example to point to when articulating the needs of older adults as an end-user population. Second, looking at this individual user's story and experience also helps illustrate the methods and methodology employed in the dissertation, so that readers have a fuller understanding of the context surrounding the data and its collection.

Chapter 5: Interview Results

Themes from the interviews will be presented, first through a broad assessment of codes across all 16 of the interviews, and second through individual vignettes or cases that illustrate

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[9] Some of these methodological considerations will come from my 2018 Cultural Rhetorics presentation, "Method(ologie)s for Conducting Research in and With Communities," which is available here: http://allegra-w-smith.com/conferences/.

noteworthy instances. Because some of the interview responses from participants resemble digital literacy narratives, attention will be paid to how the participants developed their technological expertise, as well as how they use technology today. Insights from this chapter will shed light on elders' motivations for adopting technologies, how they learn to use devices and interfaces, and common problems that they articulate when asked about their difficulties with technology.

Chapter 6: Observation Results

The chapter describing the results of the observation sessions will further the themes of the interview results chapter, as well as providing specific examples of interface designs that help and hinder older adult participants from reaching their goals. The naturalistic, unstructured observations will be analyzed using multimodal coding methods (Blythe, 2007) that begin with the manifest content (what's happening on the surface of the technology use) before delving into the latent (motivations behind the use, as well as deeper cultural and generational influences). The structured task observations will be analyzed using several different task analysis methods, providing a broad overview of the users' successes (and failures) with the tasks and the amount of time they spent completing them, before providing focal examples to illustrate common themes and noteworthy instances from the observations.

Chapter 7: Conclusion

The conclusion to the dissertation will provide guidelines for architecting user experiences (UX) with older adults and aging populations in mind, as well as methodological considerations for conducting user research with these groups. The interpretation of the research data will yield insight into the most common digital activities of one community of "oldest old" users, as well as the barriers faced by this age cohort when attempting to interact with interfaces and devices. I plan to give recommendations for physical and cognitive design, as well as interventions into education/training and documentation that can reduce friction between these users and the tasks that they are trying to complete. This concluding chapter will also provide heuristics for considering culture—specifically generational cultures, though the framework given could be adapted for other cultural categories and markers of difference—as a category of user analysis. Some user experience literature recommends seeking to "transcend culture" with design, but I plan to make a case here for cultural consideration and, when appropriate, localization. In keeping with the traditional of universal design, these concluding recommendations and best practices will not only improve user experiences for older adults, but for all users.

Project Timeline

Date	Research Tasks / Deliverables
February 2016	• IRB for Phase I (interviews) submitted and approved
March 2016	• Completed Phase I data collection (16 interviews)
Summer 2016	• Transcribed interview data

Date	Research Tasks / Deliverables
February 2018	• IRB for Phase II (observations) submitted and approved
March 2018	• Completed Phase II data collection at research site (14 observations: 2 each with 7 participants)
April 2019	• IRB renewal submitted and approved
June 2019	• Defended and revised prospectus; interview + observation cases at Computers & Writing conference
Fall 2019	• Transcribe observation videos (currently in progress) • Begin data analysis • Draft Chapter 4 (case study)
October 2019	• Presented data themes at SIGDOC 2019 conference (published in conference proceedings + received feedback on work in progress)
Spring 2020	• Continue data analysis • Draft introduction and literature review chapters (1 & 2)
Summer 2020	• Draft results chapters (5 & 6); revise Chapters 1 & 2
Fall 2020	• Draft methods chapter (3) and conclusion (7) • Submit completed draft to advisor at end of semester
Spring 2021	• Defend dissertation in April; deposit final copy to graduate school in May

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Appendix A: Interview Questions for First Stage of Data Collection

1. Demographic questions...
    a. How old are you?
    b. How long have you been in The Villages?
    c. When did you first learn to use a computer? The internet?
2. Why do you use a computer? (for what purposes)
3. Why do you use the internet? (for what purposes)
4. Who do you communicate with online? (e.g., family, friends, colleagues, groups around hobbies/interests or identities, etc.)
    a. How do you communicate with these individuals and/or groups?
5. Which social media platforms (e.g., Facebook, Twitter, Pinterest, YouTube, etc.) do you use?
    a. Why?
6. Which social media platforms don't you use?
    a. Why?
7. How do you learn how to use a new computer program or website?
8. Tell me about a time when you had a computer or internet problem.
    a. How did you solve your problem?
    b. How did you feel throughout the process?
    c. Could you think of anything that would have made solving your problem easier or less stressful?
9. If you could tell the designer of your computer or a particular website one thing, what would you tell them? *(For example, my grandmother would tell Yahoo! not to send important alerts by text message because her cell phone can only send and receive calls)*
10. *(If participant has children or grandchildren)* Do your children or grandchildren help you use the computer or internet?
    a. What digital activities, if any, do you engage in with your children or grandchildren?
11. Is there anything else that you would like to tell me about this subject?

Appendix B: Protocol for Second Stage of Data Collection

Observation #1

Please walk through your "everyday" computer and internet use. How do you use your computer? What tasks are typical? You can consider things like email, news, keeping in touch with family and friends, searching for information, etc.

As you walk through your typical computer and internet use, please try to "think aloud." Say the steps that you are taking and explain what you are doing, why you are doing it this way, what you are thinking, how you feel about it, what you're observing, etc. Just keep talking.

Exit Interview #1

1. How old are you?
2. How long have you been in The Villages?
3. When did you first learn to use a computer? The internet?
4. How did this observation experience go for you?
5. Is there anything else that you'd like to say about this observation, or tell me about your experience?
6. *Follow-up questions may be asked based on the participant's actions in the observation, or their responses to previous questions.*

Observation #2

I am going to ask you to complete a series of tasks for this observation. The tasks will gradually get more complicated and difficult. I cannot tell you how to complete them or give you help—one of the purposes of this study is to see how you troubleshoot problems that you may run into online. can skip a task and come back to it later, or give up on it if you feel unable to complete it. This is not a test, so please try not to feel too self-conscious!

As you complete these tasks, please try to "think aloud." Say the steps that you are taking and explain what you are doing, why you are doing it this way, what you are thinking, how you feel about it, what you're observing, etc. If you are having trouble, try to explain why. Just keep talking.

I will ask you to complete the tasks one by one, in order.

1. Access the internet on your computer
2. Set up a new homepage for your internet browser
3. Find a news story of interest to you about world events
4. Determine the distance between your home and the nearest Kohl's store
5. Find a government document that answers the question, "how do I deduct medical expenses for transportation to and from doctor's appointments on my taxes?"
6. Register for an account on Pinterest.com and create a private board

7. Create and validate an account on Venmo.com

Exit Interview #1

1. How did this observation experience go for you?
2. Which tasks were easy for you? Which were difficult? Why do you think that is?
3. Have you had to complete any tasks like these before? How did they go for you then?
4. When you don't know how to do something on the computer or internet, how do you figure out how to do it?
5. Is there anything else that you'd like to say about this observation, or tell me about your experience?
6. *Follow-up questions may be asked based on the participant's actions in the observation, or their responses to previous questions.*