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## **ABSTRACT**

The population in the United States is aging, with a predicted 147% increase in the number of older adults (those over age 65) from 2000- 2050 (U.S. Census Bureau, 2008). At the same time, Information and Communication Technologies (ICTs) are increasingly being used in work, leisure, and government. Despite these two trends towards an aging population and greater ICT use, very little is known about if and how older adults are using ICTs in their everyday lives (Birkland & Kaarst-Brown, 2011). Despite many calls for researchers to take a wider perspective (Bouwhuis, 2006; van Bronswijk, et al., 2009), most studies have concentrated on assistive devices or examining the care of older adults with health issues. In order to understand how older adults were using ICTs in their daily lives this study used a comparative case methodology of 17 cases, with each case consisting of an older adult and several members of their social network. Using domestication theory (Silverstone, 1994) and an interpretive interactionism approach (Denzin, 2001), this series of comparative case studies discovered five distinct domestication patterns. These domestication patterns, or user types, differ in how these users were introduced to, use, display, and the meaning they attribute to ICTs in their everyday lives.

**A THEORY OF ICT USER TYPES:  
EXPLORING DOMESTICATION AND MEANING OF ICTS THROUGH  
COMPARATIVE CASE STUDIES**

by  
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DISSERTATION

Submitted in partial fulfillment of the requirements for the  
degree of Doctor of Philosophy in Information Studies  
in the Graduate School of Syracuse University

May 2013

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ACKNOWLEDGEMENTS

to my daughter

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## **Chapter 1 : Introduction**

This document describes a series of comparative case studies of the use of Information and Communication Technologies (ICTs) by older adults in their daily lives. Drawing upon domestication theory, this study explored how older adults are using ICTs, what ICTs are being used, and how they are introduced to these ICTs. This study also examined the meanings that these ICTs and their display have to older adults, and how the use (or non-use) of these ICTs impact older adults' overall life satisfaction. This section begins with a short description of the research problem and a description of the scientific and practical motivation for the study. A short description of the purpose of this study follows. The final section of this chapter describes the contributions this study hopes to make to the areas of theory and practice. Appendix A provides a glossary of important terms used in this document.

### **Problem Statement**

In the United States, our population is aging. It is predicted that 1 in 5 individuals (21%) will be age 65 or older by 2050, compared to 1 in 7 (12%) currently. This will represent a 147% increase in the number of older adults from 2000, despite the fact that the population is estimated to only grow 49% from 2000 to 2050 (U.S. Census Bureau, 2008). The aging of our population will have dramatic implications for governmental and social services, workplaces, and our society in general.

At the same time, ICTs are becoming more common and even essential in everyday life in tasks from work, to leisure, to government. While these two trends may seem unrelated, the interaction between the two is concerning. Historically, older adults

have always had lower rates of ICT usage compared to middle aged adults (Adler, 1996; Eastman & Iyer, 2004; Kamal & Patil, 2003; Lam & Lee, 2006; Opalinski, 2001). ICTs can “play a role in disenfranchising people from their right to gain access to, and apply, information essential to their leisure and working lives; that they may completely transform deeply culturally embedded notions of individual privacy; and that they may exclude people from social and economic activity if they are unable to access or to use the network and services available to others” (Mansell & Silverstone, 1996, p. 4). Therefore there is a concern that older adults (who statistically do not report high use rates of these increasingly important ICTs) may be excluded from governmental, employment, and leisure activities.

But what do we know about ICT use by older adults? The answer to this question is that we know very little, considering the importance of aging and the increasing technological focus of communication and information in our society (Millward, 2003). Much of the literature has focused on assistive technologies-- mainly addressing the health concerns surrounding an aging society (Birkland & Kaarst-Brown, 2007; Birkland & Kaarst-Brown, 2010, 2011). However, many other issues (and potential benefits) exist, outside of healthcare. These include issues of an aging workforce (suggesting both increased retirement rates and more individuals aged 65 and over in the workplace) (Hedge, Borman, & Lammlein, 2006) and issues surrounding the use of ICTs for governmental communication, citizen participation, and service delivery (see for example Roseman & Stephenson (2005) for a discussion of the impacts of introducing electronic voting on older adults).

The next two sub-sections of this chapter detail several of the gaps in the literature and our practical knowledge regarding older adults and ICT use. The table below provides an overview of the gaps that will be discussed in the following sections.

**Table 1.1 Literature and Practical Gaps in our Knowledge about Older Adults and ICTs**

<b>Literature Gaps</b>	<b>Practical Gaps</b>
Gerontechnology literature focuses mainly on physical and cognitive concerns, no research on how ICT use impacts life satisfaction	Only have literature on adoption (narrowly defined as “user/non-user”) without a clear understanding of how ICTs are being used or introduced
Focus on single ICTs, no knowledge of how ICTs are used complementarily by older adults	Need to shift focus from conceptually viewing ICTs as empowering or disenfranchising to empirically understanding how ICTs are actually being used
ICT use explored in single contexts (such as the home)	Almost no literature on ICTs in work, despite many older adults continuing to stay in the workplace beyond the traditional age of retirement
ICT meaning is underexplored	Meanings of ICTs could shed light on older adult preferences for ICTs
Little research on how relationships and tasks from different aspects of the older adult’s life influence introduction and use	

These gaps in the current literature are discussed in the next section.

### *Gaps in the Literature*

Literature on older adults and ICTs has mainly focused on four domain areas, as indicated by previous work in the area (see Figure 1.1).<sup>1</sup> The majority of the research has

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<sup>1</sup> The statistics on the literature regarding older adults and ICTs that follow in this chapter and are presented in Figure 1.1 are taken from previous bibliographic work. This previous bibliographic work was developed from a meta-analysis of over 600 articles published regarding older adults and ICTs. The goal of this

focused on the physical and cognitive concerns of older adults, such as decreasing dependency and improving general usability of ICTs for those with cognitive or physical impairments. A small area of literature has examined the financial concerns of older adults. Several studies have examined organizational concerns, including the work environment for older adults; however, many of these articles have focused on healthcare administration (concerns about preparing professionals and providing care to an aging population). While some literature has examined the social concerns facing older adults, including how ICTs can benefit engagement of older adults and also decrease their levels of social isolation, no research has examined how use impacts life satisfaction in general.

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previous study was to identify the breadth and depth of the literature on older adults and ICTs, including the topics researched, methods used, theoretical backgrounds, and the ICTs studied. Papers for this meta-analysis were gathered from an extensive search of 10 databases using combinations of terms for "ICTs" (information technology, computer, pc, email, etc.) and "older adults" (such as senior, elderly, older adult, etc.). The top IS journals (according the Association of Information Systems (AIS)) were also independently searched for relevant articles using the same search terms. Only research, literature review, and conceptual articles are included in this analysis (popular literature is not included) (Birkland & Kaarst-Brown, 2007; Birkland & Kaarst-Brown, 2010).

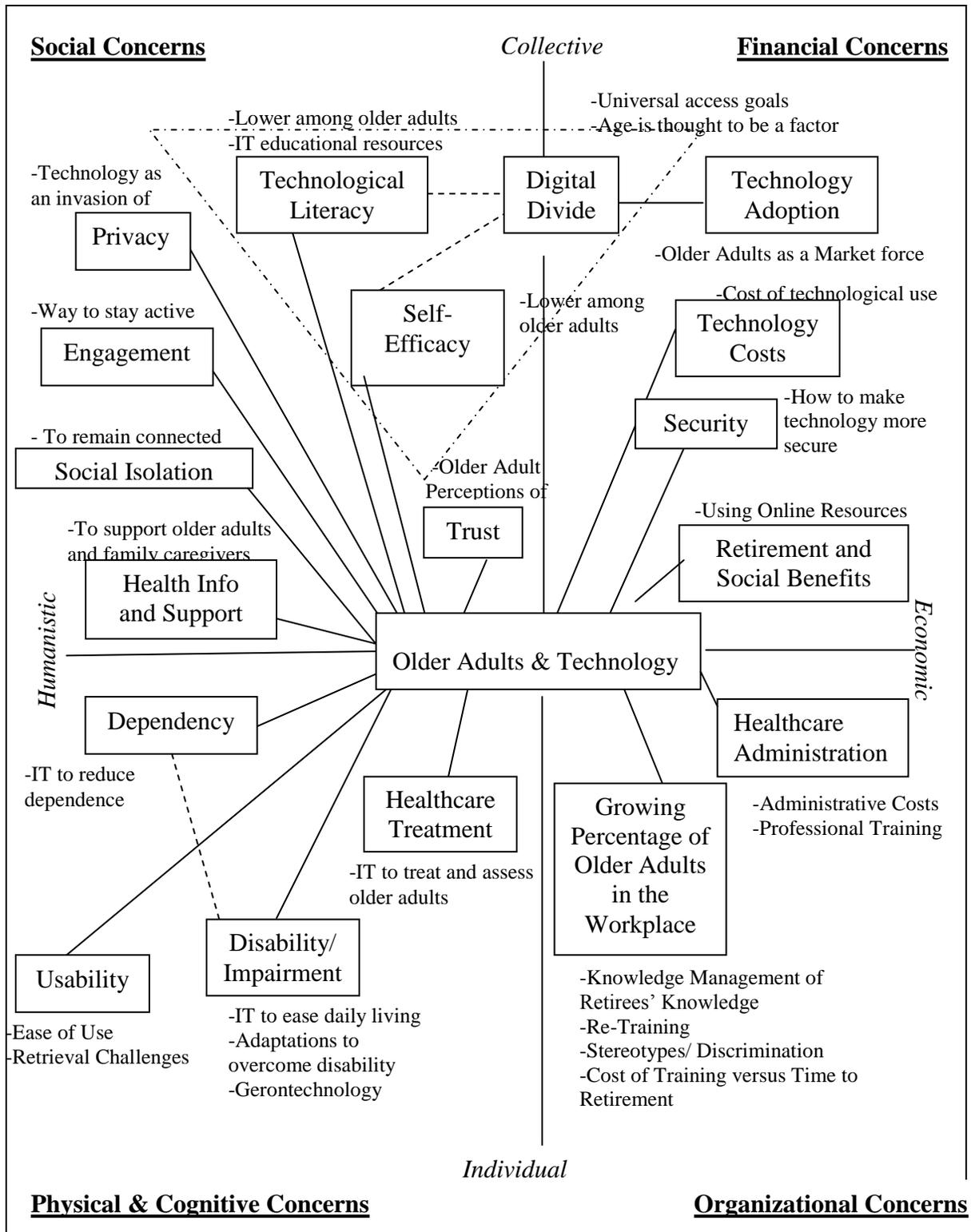
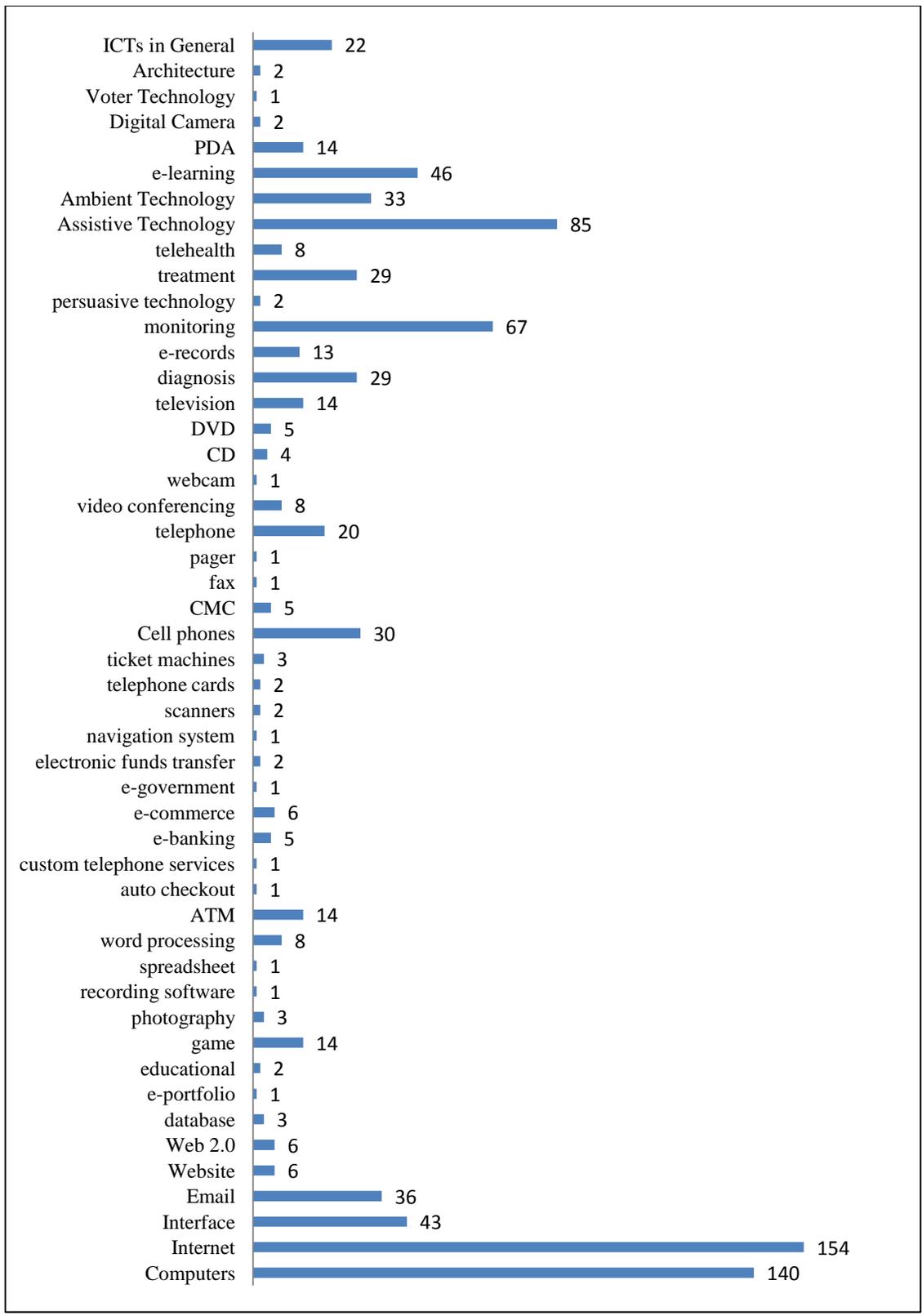


Figure 1.1 Representation of the Issues Faced by Older Adults

Overall, the studies mentioned above have traditionally explored the use of single ICTs for very specific goals, or in very specific settings. This has resulted in knowledge about a few ICTs in very specific contexts, but we lack knowledge about how ICTs are used in the various life contexts of older adults (work, family, leisure, and community) and how use differs or is similar between these different contexts. If we examine the types of ICTs that have been studied, we can see that many of these studies have focused on computers, email, and the internet (see Figure 1.2). A large number of studies (85 studies) have also focused on assistive and health ICTs (such as smart wheelchairs), as indicated by “Assistive Technology” in the figure. Another large portion of the studies have focused on monitoring technologies (67 studies), which are primarily used for health and activity monitoring (to support independent living by monitoring for falls or other sudden health concerns, such as decreases in blood sugar levels). Studies that have examined ICTs in general have mainly been conceptual or review articles (22 articles), which conceptually address some issues in ICT use by older adults.

One of the issues with the studies represented in Figures 1.1 and 1.2 is that we do not understand the diversity of ICT usage by older adults. By examining single ICTs, we do not understand how the usage of these ICTs differs by context, or how these ICTs and their use complement each other. This figure also supports the fact that research on older adults and ICTs has been primarily concerned with exploring the usage of ICTs for health (physical and cognitive concerns).



**Figure 1.2 ICTs Studied in the Gerontechnology Literature**

The gerontechnology<sup>2</sup> studies surrounding ICT usage have mainly explored use in a single environment; such as the use of computers in a seniors-only computer course (Dunnett, 1998; Irizarry, Downing, & Elford, 1997; Mynatt, Adler, Ito, Linde, & O'Day, 1999) or the use of ATMs versus face to face banking (Chan & Wong, 2009). These studies have also tended to focus on single ICTs in a single life context, such as the use of computers in leisure (Buse, 2009; Trentin, 2004) or in work (Baldi, 1997; Bove, 1987; Charness, 2006; Charness, Schumann, & Boritz, 1992; Gist, Rosen, & Schwoerer, 1988). Many of the studies have focused on assisting and monitoring older adults with health conditions (see Figures 1.1 and 1.2). However, ICTs and the media they convey are consumed and used every day by people in multiple life contexts (Silverstone, 1999). It is important to understand use not only in the context of extraordinary events, but also during the non-critical practices of everyday life (Silverstone, 1999), therefore the focus of this study was on older adults' everyday ICT usage.

One of the valuable assets that domestication theory brings to this study is that it emphasizes the importance of not only understanding why ICTs are adopted or not, but also how people adapt (or tinker) with ICTs and how this "tinkering" affects the ICT's use (Lie & Sørensen, 1996). The process of ICT development continues once an ICT is released to the public, as users adapt the ICT and fit it into their everyday behaviors (Silverstone & Hirsch, 1994). Based upon the current literature available on older adults and ICT use, it is difficult to understand how the use of multiple ICTs are different across

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<sup>2</sup> The term gerontechnology refers to studies that focus on technology (including ICTs, but also other forms of "technology" such as wheelchairs) and aging issues. This includes studies done in this area by researchers who would not necessarily label themselves as gerontechnologists, who may have completed one or two studies in this area, but their overall researcher agenda is not on technologies and aging.

life contexts, including how ICTs are used together, separately, or adapted by older adults to fit their lives.

While there is at least some research on ICT use in limited contexts, there is no gerontechnology research that examines the meanings of ICTs to older adults. Much of the literature in this area has focused on implementing ICT designs for care and cognitive and physical concerns related to aging (van Bronswijk, Bouma, & Fozard, 2002; van Bronswijk, et al., 2009) but has ignored the meanings of these devices to older adults. Although it is well-known that older adults on the whole do not prefer using ICTs or assistive devices they see as stigmatizing (Bagnall, Onditi, Rouncefield, & Sommerville, 2006), little research has examined the meanings of these devices or ICTs in general to older adults.

The importance of understanding how individual's social relationships impact usage has been emphasized in domestication research. This perspective has been proven very important, as individual's exposure to technology often happens through social and family relationships as well as work roles (Stewart, 2007). However, there is not much research that has examined the role of relationships in how older adults are introduced to new ICTs, or how their usage is affected by those that surround them. We do not know why and how older adults are using ICTs in their everyday lives, and how their involvement in different contexts impacts their use. It is likely that relationships and tasks within each context impact older adults' use (and that older adults' use is different across different contexts). Therefore, one of the goals of this study was to understand this issue from a context-rich perspective.

*Practical Issues*

Even if a gap in the literature exists, filling that gap has to be practically important (Bentz & Shapiro, 1998; Denzin, 2001). Given this gap in the literature, why is understanding use of ICTs by older adults important from a practical perspective? In practice, we do not know how older adults are actually using the ICTs that they report that they use in national surveys (see for example Eastman and Iyer (2004), Iyer and Eastman (2006), and Reisenwitz, Iyer, Kuhlmeier, and Eastman (2007)). There are many different levels of use of an ICT. For example, consider two individuals who report that they use the internet. One of these individuals only visits the websites that have been bookmarked in their browser by a child or friend, such as their local newspaper. They never search the internet or use any other internet applications. The second individual actively searches the internet, visits bookmarked pages, pays their bills online, sells things on e-bay, and is involved in several online discussion communities. Both of these individuals are considered internet users, and based upon many of the surveys that have been used to examine the digital divide, would be placed into the “user” category. Among non-users, there can be individuals who never use an ICT directly, but are active consumers of the information or communication provided by an ICT. They may have another member of the household that prints out information for them, or even use applications while others physically manipulate them (such as someone who speaks on Skype, but does not start or end the program).

The previous digital divide survey literature clouds the issue of “use” because it examines use as either “user” or “non-user” adoption, and ignores how an ICT is actually used (Millward, 2003; Paul & Stegbauer, 2005). Therefore, this study seeks to understand

use beyond “user” or “non-user.” Domestication theory posits that how an ICT is used is extremely important, and therefore seeks to understand use beyond simple adoption (Silverstone & Hirsch, 1992). Although this explanation of the different older adult users of ICTs makes sense conceptually (we can all probably think of individuals we know that are similar to each of these examples), we do not have any scientific work that has indicated that these use types exist. Therefore, there is a very practical need to understand the different types of use, in order to understand not only how we can be more inclusive in our information policy, but also so that we understand the older adult market for ICT goods and services. Understanding the meanings that older adults assign to ICTs can also be helpful in understanding the older adult market for ICTs.

Related to understanding use, there is also a need to move away from conceptualizing the use of ICTs by older adults as either empowering or disenfranchising. It has been assumed in the literature that older adults are either empowered or disempowered by ICTs without empirical evidence to support this assumption. It is very important to understand, in a practical sense, if ICTs are empowering and/or disenfranchising (or anything between). This split is observed in the literature (Selwyn & Gorard, 2008), with ICTs presented in some studies as empowering tools (see for example Eaton and Salari (2005) and McMellon and Schiffman (2002)) and in other studies as obstacles for older adults participation in society (see for example Pieper (2005)). This study, by using the domestication framework understands that ICTs can be both (or a mixture) to the same person in different contexts. With increasing digitalization within our society, we do not understand if the digitalization of services and products is excluding or including or not impacting older adults. With little understanding of how

ICTs are impacting older adults, it is difficult to create policies and services that are effective for an aging population. Knowing how older adults are actually using ICTs is important to understanding what services and products will appeal to and be used by older adults in certain contexts.

Finally, very little practical information is known about the use of ICTs in work by older adults. As our workforce ages, there will be increased pressure and need to maintain older workers beyond the traditional age of retirement (Hedge, et al., 2006). However, very little is known about older adults' participation in the workforce. This study, by expanding the contexts of research on older adults, indicates some of the impacts of work on ICT use.

### **Purpose of this Research**

The purpose of this research was to develop a richer, more contextualized understanding of older adults' ICT usage in their everyday lives, with specific focus on the life contexts of family, work, community, and leisure. Using domestication theory, this research sought to understand how older adults' are introduced to ICTs and how relationships and tasks within these contexts influence their introduction and use. This research also sought to understand how older adults display (arrange) their ICTs and the meaning that these ICTs come to have to older adults. This research also sought to understand the expectations that older adults have for their own usage (and those in a similar birth cohort) and the expectations that others have for the older adult's usage.

In order to study these questions, this study undertook a series of interpretive comparative case studies of 17 older adults and members of their network.

## Research Questions and Definitions

This research asked several important research questions that attempt to fill the gaps in the literature previously outlined as well as to gain this important practical knowledge about older adults ICT use. The overarching research question asked: *How are ICTs domesticated by older adults in their everyday lives?*

This study asked several research sub-questions that draw from domestication theory:

- How are ICTs introduced to older adults?
- How are older adults using ICTs in the life contexts of family, work, leisure, citizen, and community? How do these contexts, including the tasks and relationships associated with these contexts, influence ICT use?
- How does gender influence ICT use in the life contexts of family, work, leisure, citizen, and community?
- How do older adults display ICTs?
- What are the meanings of ICTs, their use (and non-use), and their display in these different life contexts?
- How does ICT use (or non-use) impact an older adult's life satisfaction?

Domestication theory proposes that ICTs are introduced into individual's lives, are used in different ways (creating routines of use), are displayed, and then develop meaning to the individuals (Silverstone & Haddon, 1996; Silverstone & Hirsch, 1992; Silverstone & Hirsch, 1994; Silverstone, Hirsch, & Morley, 1994). This study focused on older adults born from 1936-1946, comprising the younger members of the Lucky Few birth-cohort (Carlson, 2008, 2009).

ICTs refer to Information and Communication Technologies that are marketed to the general public, including both physical ICTs (such as cell phones and computers) and software and applications (such as social networking applications and computer programs). This includes computers, telephones (landlines), cell phones, internet, email, social networking software and applications, radio, television, radio, and print media (magazines, catalogs, and newspapers). Internet and computer applications are also considered ICTs, such as Skype, word processing, digital image software, etc. ICTs which allow individuals to access the information or communication potential of these devices or media, such as screen readers (to read web pages or other digital information) and TDD/TTY phone services were also included.

ICTs did not include (for the purposes of this study): Technologies that are specifically marketed towards individuals with disabilities, chronic conditions, or physical limitations that are not intended as information or communication devices. This includes health technology (for example, blood sugar meters or health sensors, non-computerized assistive technology (for example, wheelchairs, magnifying glasses), and computerized assistive technology that does not serve a communication or information purpose and is marketed towards specific sub-groups of the population who have physical impairments or limitations (for example, computerized wheelchairs; etc.).

Computerized technologies marketed to the general public that are not originally intended to be assistive (and therefore are not marketed as assistive technologies), but are used as assistive technologies by the older adult to access information or communication were included in the study. For example, Skype and other voice-over-IP technologies would have been included, even if an older adult uses Skype because it allows them to

adjust the volume more than on the telephone. However, an older adult's "smart" walker would not have been included in the scope of this study, as this is a device that is marketed as an assistive device, with no communication or information function.

### **Contributions of this Study: Theory and Practice**

This research study proposes that it makes six main contributions to theory and practice. This includes a better understanding of ICT use from a birth-cohort perspective, expansion of the theory of domestication and gerontechnology study into the work domain, and an expansion of gerontechnology literature by studying multiple life contexts and ICTs. This study also empirically examines the proposed relationship between life satisfaction and ICT use while using the case study methodology, a methodology that has only been used a few times in the gerontechnology literature.

First, very little of the research studying older adults and ICT use has examined birth cohorts' experiences, focusing instead on age. Very little attention has been paid in previous studies to the birth-cohort(s) of the participants (Birkland & Kaarst-Brown, 2007; Birkland & Kaarst-Brown, 2010). Different birth cohorts experience the same numerical ages differently, due to different life experiences and historical events (Giele & Elder, 1998) (such as different experiences with ICTs and general technology during youth and other formative experiences in their youth and adult lives). Therefore, it is unclear if ICT usage will be different for birth-cohorts who age into "elderhood" (Paul & Stegbauer, 2005). This study sought to understand the ICT usage of the younger half of the Lucky Few birth cohort (born from 1936-1946), thereby taking a more cohort-sensitive approach to understanding use. It is likely that due to different experiences with ICTs throughout their lives, different birth cohorts may have different perspectives and

patterns of use in older adulthood (Rama, De Ridder, & Bouma, 2001). (For instance, the Baby Boomers were the first birth cohort to experience the world visually through ICTs as young children through television (Mansell & Silverstone, 1996)). Therefore, a contribution of this study is an examination of a specific birth-cohort's use of ICTs. Livingstone (2008) has argued for a child-centered study, where the focus of the study is on the children, rather than the parents and parental decisions. Such a similar call could be made for older adults: rather than looking at advertisers' or designers' decisions for older adults, examine the older adults themselves. Previous work in domestication theory has not been used to study older adults from the U.S. Lucky Few generation, so this study explores the domestication process with a new population of study.

Second, much of the literature in domestication and gerontechnology has called for the study of the work domain. Domestication theory has mainly been applied in the home (Silverstone, et al., 1994), with a few studies examining social leisure (Håpnes, 1996; Lamvik, 1996) and professional groups (Saetnan, 1996). However, few domestication studies have examined the influence of ICT use in work on use in the family, and vice versa, despite the importance of ICT transfer between these two life contexts (Miles, Cawson, & Haddon, 1994). A theoretical contribution of this study is the extension of the domestication theory into the context of work. In addition, no domestication studies have explored the facets of family, leisure, work, and community in the same study. (Domestication literature on the community context, especially considering ICT usage in government and volunteering, seems to be lacking.) Therefore, a related theoretical contribution of this study to domestication theory is the expansion of the theory to understand all of these life contexts. Although domestication theory has

emphasized the importance of relationships within these contexts, very few studies have examined the impact of relationships on ICT use, introduction, and display. This study examined the impact of relationships and tasks in these different contexts, therefore contributing to domestication theory's understanding of the importance of relationships and tasks on the domestication process.

Third, Gerontechnology has long called for more research within the life contexts of leisure and work for older adults, rather than focusing mainly on care (Bouwhuis, 2006). The less explored life contexts of community dwelling older adults; family, leisure, community, and work; are considered important to understanding ICT use in the older adults entire life (Bouma, Fozard, Bouwuis, & Taipale, 2007; van Bronswijk, et al., 2002). By examining these multiple contexts, this study sought to understand not only use in each of these contexts, but how use in one context influences others, and if and how ICTs are context specific. Therefore, this study, by exploring these contexts, also sought to expand the literature and understanding of ICT usage by older adults in their everyday lives.

Fourth, this study contributes to the literature on gerontechnology, as well as domestication theory, by exploring the use of multiple ICTs. Domestication theory posits that ICTs' use and meaning cannot be understood in isolation from other ICTs, however, the vast majority of domestication studies have explored the use and meaning of single ICTs in the family context (see for example Habib and Cornford (2002) and Wheelock (1994)). Therefore, by expanding this study to explore the relationships and use of multiple ICTs, this study expands both an understanding of their use, but also an understanding of their use in multiple contexts.

Fifth, research on older adults' ICT use has often posed that usage increases the social engagement of older adults, decreases social isolation, and generally benefits older adults' lives (Dorin, 2007; Karavidas, Lim, & Katsikas, 2005; Osman, Poulson, & Nicolle, 2005; Ryan & Heaven, 1986; D. Smith, 2005; Waldron, Gitelson, & Kelley, 2005; Xie, 2008b). This study actively seeks to understand how older adults' life satisfaction is impacted by their use (or non-use) of ICTs; a relationship that has been suggested in the literature. ICTs are dualistic in nature (Silverstone & Hirsch, 1992; Silverstone, et al., 1994) and therefore may not only increase life satisfaction, but also diminish it. This study sought to determine whether the proposed relationship between life satisfaction and ICT use exists.

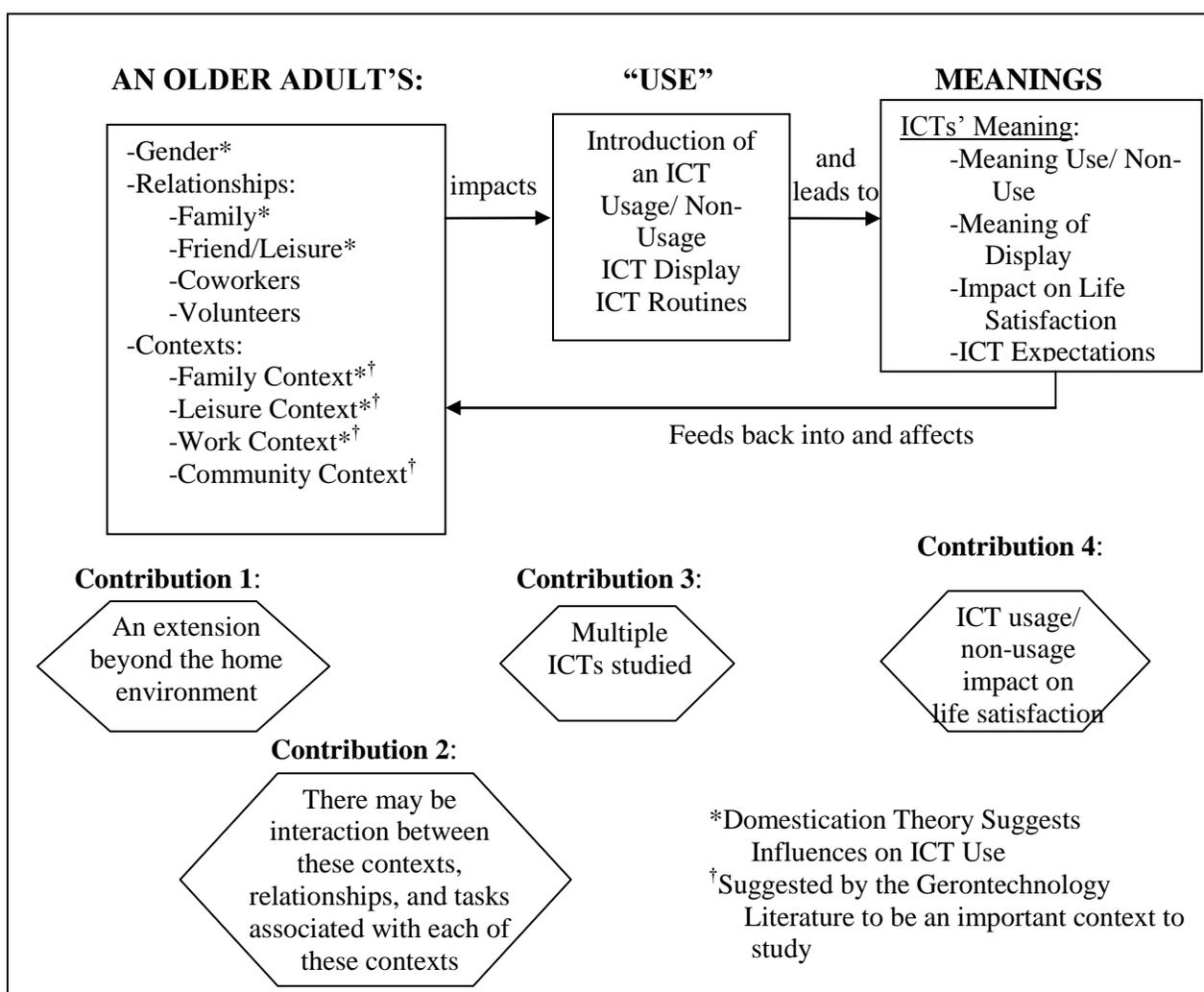
Finally, this research employs the comparative case study methodology. Very few studies researching older adults and ICTs have employed the case study methodology (Birkland & Kaarst-Brown, 2010). Using primarily qualitative methods (interviews), this study also provided further information on how this approach works with older adults.

Practically, this study makes several recommendations to policy. Governmental and private investments in infrastructure and policy bias the trajectory of ICT change in our societies (Mansell, 1996). Affecting information and ICT policy can therefore help to influence the trajectory of ICT change in the United States, both at a governmental and organizational level, in order to make such policy more in line with the needs and wants of our aging population.

The following chapter explores the previous literature on domestication theory and older adult's ICT usage, presenting a model for this study.

## Chapter 2 : Literature Review

This study sought to understand the introduction, usage (and non-usage), display, and routines surrounding ICTs in the lives of older adults. This study also explores how these factors led to the development of meaning and expectations surrounding ICTs and how ICT use impacts life satisfaction. To do this, this study draws on several areas of theory and literature in, as is shown in Figure 2.1.



**Figure 2.1 The Theoretical Relationships between Constructs in this Study, Contributions of this Study to Theory, and the Sampling Frame**

Figure 2.1 draws upon domestication theory, the gerontechnological literature, and information systems literature in order to understand the use and non-use of ICTs by older adults in their daily lives. Domestication theory argues that in order to understand how technologies are used and the meanings attached to these ICTs, we must also understand the relationships between life contexts, and how use and meaning of ICTs is interrelated or different (Lie & Sørensen, 1996). The social resources in each of these contexts that are available to potential users are instrumental in supporting use; such as computer support, software exchange, and contact with other users (Murdock, Hartman, & Gray, 1994). The impact of several of these contexts have been determined in studies on domestication theory (mainly in studies on children and/or middle aged adults), but previous studies have not examined the interaction between these contexts.

Domestication theory has particularly studied the context of the family and its relationships, as well as personal impacts such as gender on use, how ICTs are used, and the routines surrounding ICT usage. Despite researchers' calls to study domestication beyond the home context, very few studies have actually looked at ICT use outside of the home setting. Since other areas of an individual's life bleed into their home lives, it is important even for studies that concentrate on the home environment to consider ICT usage in other contexts (Haddon, 2007). Studies using domestication theory also have sought to understand the use of ICTs for leisure purposes, such as playing games.

Theorists working within domestication theory have also suggested that work is an important life context (Lie & Sørensen, 1996); however, this context and its impact on ICT use is not well understood.

Older adults have many different contexts in which they interact with others. Gerontechnology has also identified the contexts of family and work to be important to ICT use, in addition to the contexts of community (including governance) and leisure. The model presented in Figure 2.1 integrates the literature from domestication theory and gerontechnology and suggests that the tasks and relationships involved in each of these contexts influence the introduction, use (and non-use), display, and routines surrounding ICTs. In turn, the display of ICT's come to have meaning to older adults and impact their life satisfaction. Expectations for ICT use are also formed. These meanings, life satisfaction, and the expectations of use go on to have impacts on the older adult's relationships, tasks, and experiences in their life contexts.

An older adult can have many potential relationships across these different contexts (see Figure 2.2). For instance, an older adult may have a relationship with their cousin coworker, whom the older adult considers a friend. In this study, such multiple relationships existed for many of the participants. Beyond studying these relationships, this study also sought to understand how the tasks associated with these different life contexts impact ICT usage (and non-usage), display, and routines; and therefore impact the meanings, expectations, and life satisfaction of the older adults.

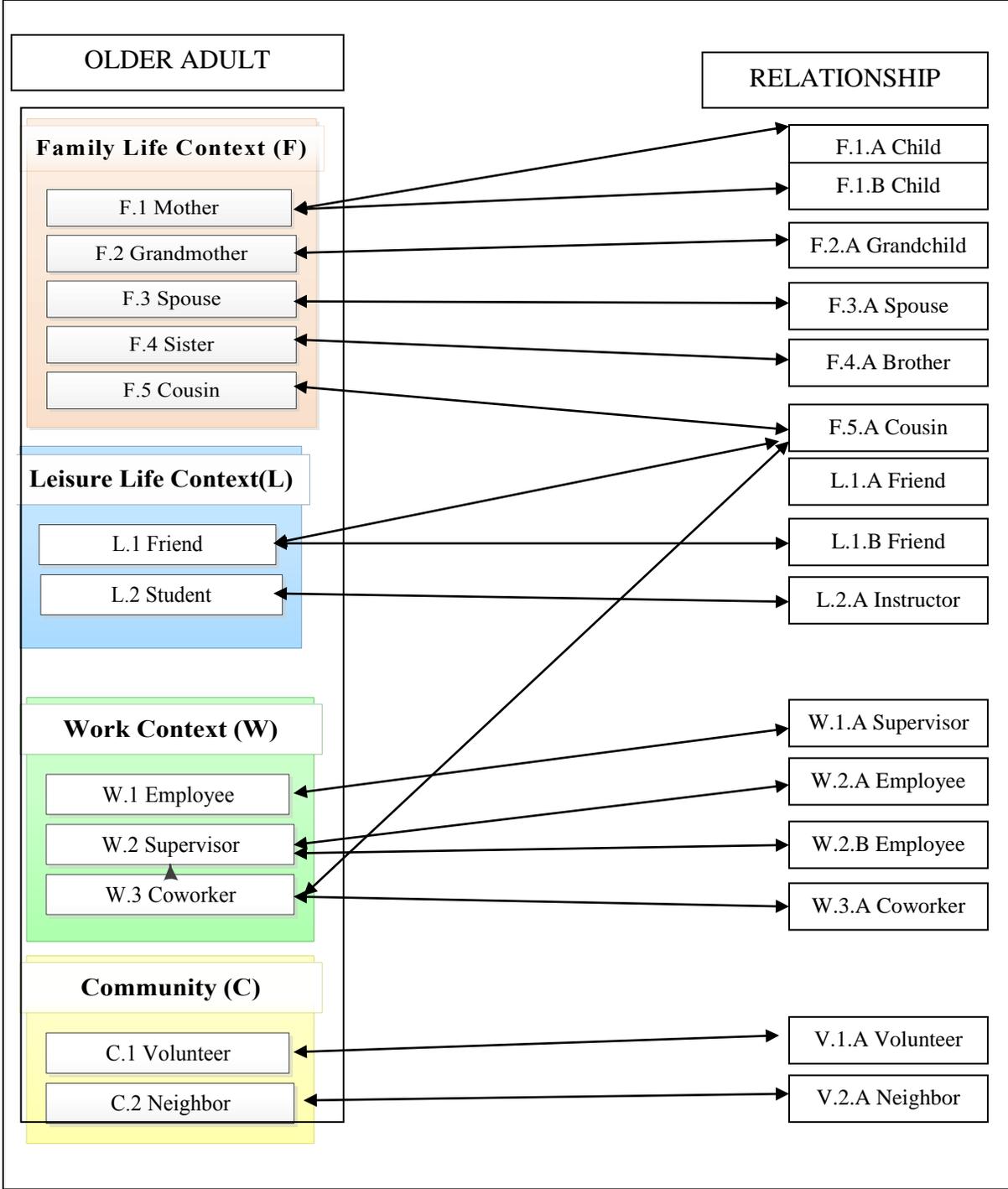


Figure 2.2 Illustration of Possible Contexts and Potential Relationships with Others

The next section of this paper discusses domestication theory, and the process of domestication.

### **Domestication Theory**

This study draws heavily from domestication theory as well as the literature published on older adults and ICT use. The domestication perspective is quite different from other technology research that looks purely at users as either adopters or non-adopters, which most research covering older adults and ICT use has focused on (Paul & Stegbauer, 2005; Selwyn & Gorard, 2008). Domestication focuses on the development of meaning to users and non-users, how technology is integrated into daily life, and what technology comes to represent to individuals (Silverstone & Hirsch, 1992). Domestication researchers are interested in types of use of technologies, the symbolic meaning, and personal attachment to ICTs (Lie & Sørensen, 1996). Therefore, in this context-rich view, adoption is one of a series of steps in integrating an ICT into a household (Lie & Sørensen, 1996; Silverstone, et al., 1994):

1. ICTs are first *introduced* to, or “appropriated” into a setting. Here they are removed from the public sphere to acquire meaning in the private sphere of the home. Meanings in the private and public spheres are not necessarily the same.
2. The ICT allows the home to be classified via the process of objectification, through *display*. This includes how the ICT is displayed or arranged, and who identifies with and feels comfortable with these technologies. It is important to understand that before these products were brought into the home, the home environment and the objects in it already had meaning. This meaning cannot be understood in isolation from other ICT objects in the home.

3. Incorporation includes how the ICT is *used*, including how use is impacted by contextual factors, such as gender and status, and how use reinforces these.
4. The ICT and its placement in the home (or with the person) develop *meaning* to both the individual and to the larger social society, and help in both self-identification and the identification of others. (ICT consumption is sometimes related to status reasons, such as a display of socio-economic class).

This process of domestication includes making ICTs acceptable and familiar or in rejecting them (Silverstone & Haddon, 1996). Understanding ICT rejection can tell a researcher as much about that ICT as acceptance (Umble, 1994). Domestication theory has suggested several important contextual and relationship factors that impact the introduction, usage, display, routines, and meaning surrounding ICT usage. The gerontechnology literature suggests several important aspects of a person's life to consider when studying older adults and ICTs. Following a short explanation of the model of this study in Figure 2.1, each section of the model will be explored to cover the relevant research.

A number of studies have examined the process of domestication. Domestication has primarily been studied in the context of the home and family relationships, although a few other studies have also focused on other life contexts. Many of these studies have also addressed different parts of the domestication process. (See Table 2.1).

**Table 2.1 Contexts studied in the domestication literature**

	Part of the Domestication Process Explored					
	Creation	Introduction	Routines of Use	Display	Meanings of ICTs	Domestication in General (Conceptual)
Home/ Family		(Hijazi-Omari & Ribak, 2008; Lonkila & Gladarev, 2008; Stewart, 2007)	(Aune, 1996; Balen, 2010; Habib & Cornford, 2002; Haddon, 2000; Hijazi-Omari & Ribak, 2008; Hirsch, 1994; Lie, 1996; Ling, Nilsin, & Granhoug, 1999; Lonkila & Gladarev, 2008; Murdock, et al., 1994; Ribak, 2001; Singh, 2001; Vestby, 1996; Wheelock, 1994)	(Katz & Sugiyama, 2006; Livingstone, 2008)	(Hijazi-Omari & Ribak, 2008; Hirsch, 1994; Ling, et al., 1999; Livingstone, 1994; Miller, 1994; Murdock, et al., 1994; Ribak, 2001; Umble, 1994; Vestby, 1996)	(Ang, 1994; Cockburn, 1994; Haddon, 1994, 2007; Lie, 1996; Lie & Sørensen, 1996; Livingstone, 2007; Putman, 1994; Silverstone, 1999, 2007; Silverstone & Haddon, 1996; Silverstone & Hirsch, 1992; Silverstone & Hirsch, 1994; Silverstone, et al., 1994; Stratham, 1994)
Work	(Quintas, 1996)		(Saetnan, 1996; Singh, 2001)			
Leisure			(Buse, 2009; Singh, 2001)		(Håpnes, 1996; Lamvik, 1996)	
Ads	(Hubak, 1996)					(Miles, et al., 1994)
Not Specified	(Mansell, 1996; Mansell & Silverstone, 1996)			(Flynn, 2003)		

Although the vast majority of studies in domestication have focused on computers (see for instance Habib and Cornford (2002) and Håpnes (1996)), others have focused on newly offered ICTs, such as the study of on-demand video (Ling, et al., 1999), usage of

the mobile phone by teenage girls in Palestine (Hijazi-Omari & Ribak), young adults (Lonkila & Gladarev, 2008), and U.S. and Japanese college students (Katz & Sugiyama, 2006). These studies, however, have not examined multiple ICTs. A multiple-ICT perspective is important, as domestication theory suggests that ICTs do not necessarily replace other ICTs, but rather the meanings and use of the “old” ICTs change. For example, social networking is not replacing other forms of contact, but actually facilitating face to face contact, while absorbing (not replacing) some other digital forms of communication, such as email and chat (Livingstone, 2008). Therefore, the model in Figure 2.1 encompasses studying the use of multiple ICTs, rather than the use of a single ICT.

The following sections of this paper take each part of the model in Figure 2.1 and explore the literature and the findings that have been published in domestication, information systems, and on older adults to understand each of these areas of the model. The next section specifically examines the contextual factors and gender impacts on usage from the literature in domestication and gerontechnology.

### **Contextual Factors Influencing Exposure, Use, Routines, and Display**

Domestication theory has suggested many different impacts on ICT introduction, usage, display, and ICT meaning. Gerontechnology has suggested several important life contexts of older adults that must be studied in order to understand the older adult’s entire life. These two sources have been integrated in Figure 2.1. The next section details the contributions of each of these to the contexts explored in this study.

*Life Contexts, Relationships, and Gender Impacts on Introduction, Use, Display, and Routines of ICTs Use*

Domestication theory has largely been used to examine public and private ICT usage in the home. These studies have included explorations of gender's impact on ICT usage and ICT routines in households, while other studies have examined other spheres of daily life, such as leisure and professional settings (Silverstone & Hirsch, 1994). The gerontechnological research field has suggested that there are several important contexts in the lives of older adults in which research must be completed. These include the domains of family life, leisure activities, work, and community. By integrating these two perspectives, this indicates several important contexts that must be considered not only from the study of ICT usage, but also from the perspective of studying ICTs in the lives of older adults. Each of these contexts, the impacts on the introduction, use, display, and routines of use will be discussed in the following sub-sections.

Table 2.2 shows an overview of the literature on life contexts, relationship, and gender impacts on usage, as explored in the domestication and gerontechnology literature. As can be seen, very little work is focused outside of the family context, although studies have also explored work's impact on the home, the use of computers as a form of leisure, and gender impacts on the introduction and use of ICTs.

**Table 2.2 Findings and Gaps in the Domestication and Gerontechnology Literature: Influences of Life Contexts and Gender on the Introduction, Use, and Display of ICTs**

		Family	Work	Leisure	Community/ Citizen	Gender
<b>KNOWN</b>	<b>Introduction</b>	Family member users can motivate others to learn	Conceptually work is an important point of introduction			Older adult men are more likely to own ICTs than women
	<b>Use &amp; Routines</b>	Family can be source of technical help ICT preference in family relations	ICTs in the home allow work to be brought into the home ICTs threaten work/ life balance at home	ICTs are a form of leisure	Electronic voting discourages Older Adults from voting	Women prefer ICTs viewed as personal and enabling control; Older Adult women report more issues learning ICTs
	<b>Display</b>	Families display ICTs in prominent locations, can be source of conflict				
<b>GAPS</b>						
		Little research on older adults' influence of family	Little research on the work environment itself	No literature on ICTs to facilitate leisure	No literature on ICTs in volunteer contexts	Is ICT use or sources of introduction to ICTs different for older adult men and women?
		Little research on relationships	Almost no research on older adults, ICTs, and work, despite many older adults working	No literature on leisure's influence on domestication	No literature on community context's influence on domestication	No information on gender and on ICT routines or display for older adults
		No research on family tasks that influence usage	Suggestions that work status (retired, never worked, working) may be important, no empirical evidence			

The following sub-sections of this section detail each of these contextual factors as well as gender, exploring the findings indicated in the table above and the gaps in the current literature. The next section explores the important context of family, and its role in the process of the introduction, use, and display of ICTs.

### *Family and the Home*

Domestication theory proposes that ICTs and the media become part of any family. The consumption of this media influences the structuring the family's time in everyday life (such as in watching television programs at a certain time) (Silverstone, 1994). In a similar fashion, the family's own values, relationships, and routines impact ICT usage. This reflects the "moral economy" of ICT usage and purchase: families exert their politics, values, and experiences in their purchase and use of ICTs and services (Silverstone, et al., 1994). Recognizing the powerful force of families, new ICTs are created and marketed specifically by organizations to capture household money (Miles, et al., 1994).

When examining families, the contextual environment of the family is extremely important, as this impacts how the technology is used and the meanings attached to it (Haddon, 1994). In some cases an ICT itself is not resisted by the family, but instead the *types of use* that are not in line with the family's values are resisted. Such uses that are considered inappropriate are condemned, and the use of the ICT is concentrated on other functions that are considered more appropriate by the family. In addition, families can also influence not only how an ICT is used, but also the introduction of ICTs into individual's lives. For instance, a family can be made up of users who were influenced by contexts outside of the home (such as work) and non-users who rely on others in the family to use these ICTs. Those who are non-users may feel "left out" of the ICT culture of the family. This can sometimes be motivational for the person to learn the ICT. Therefore, families not only influence how ICTs are used (ICT routines) but also if they are used by the individual, and the individual's exposure to ICTs (Hirsch, 1994).

ICT use is also seen as potentially impacted by family relationships and conflict, although many authors have indicated that very little research has examined how relationships have specifically impacted use (Hirsch, 1994). Stewart (2007) has shown that relationships within the family can influence use, and also provide resources of technical help (or connections to others who provide technical help outside of the family). Based upon this literature, one of the goals of this study was to explore how such family relationships influence the introduction, use, and display of ICTs.

While much of domestication research has focused on the family in the home, it is important to understand that the home is not a single space defined by physical walls. It is a concept of shelter that is private and personal, to which a person feels they belong. This feeling of belonging *to a space* (the household) and *to people* (the family) is seen as framing the concept of home. Individuals often use media to try to recreate this feeling of home when traveling or relocating- such as by reading the newspaper of their previous area (Silverstone, 1999). This study calls for examining the concept of family beyond the “home” in the spirit that the family is larger than the people whom an individual lives with. While in studies of young children it is quite reasonable to assume that parents and siblings who live directly with an individual are the family unit, for adults’ family relationships become much more complex and expand beyond the confines of the house that an individual lives in. For older adults, their children and grandchildren may live in separate houses, but are still important family members that influence their ICT usage. Other members of their family can also be important influencers on their exposure and usage of ICTs.

Two domestication studies have examined older adults ICT use in England (Buse, 2009; Haddon, 2000).<sup>3</sup> Haddon (2000) compared older adults' to single parents' home use of the television and telephone to determine how they were being used. It was determined that older adults often used the telephone to replace face-to-face contact and felt that their usage of the telephone had increased after they retired. (Retirees usage was not empirically compared to older adults who were still working.) Television became an important source of entertainment and information to people as they aged further into elderhood. Although Haddon discusses how these findings may be conceptually different based upon the internet, this ICT was not explored empirically. (It is also important to note that while the focus of Haddon's study was on the young elderly, the age range of the participants was not specified.) This study strongly indicates that ICT use is complementary, and that ICT use is different in older adulthood than in other life stages. It also is a strong indicator that the work context and the influence of work status on older adults' usage of ICTs warrants further examination.

Within the gerontechnological literature, most study of ICT usage has examined older adults as a single independent unit: a person who uses ICTs. Very little research has examined the impacts of family on ICT usage, except in the case of two studies that have examined the impact of ICTs on grandparent and grandchildren relationships (Quadrello, et al., 2005; Vetere, Davis, Gibbs, & Howard, 2009). These studies have demonstrated

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<sup>3</sup> It is important to note that both domestication studies of older adults and ICT use were conducted in England. In the case of Buse (2009) the age range was large and not birth-cohort focused (with participants ranging in age from 57-88) while the age range in Haddon (2000) is unclear. Even if the age range in the two previous studies somewhat overlaps this study, I would strongly argue that the "Lucky Few" birth cohort in the United States (born 1936-1946) likely had vastly different early childhood experiences than those born during the same time period in England. England entered WWII earlier, had a larger civilian exposure to warfare, and experienced a longer recovery period following the war than the United States. Although there is some similarity across birth cohort experiences in different countries, birth cohorts are not the same from one country to the next (Carlson, 2009).

that grandparents prefer to speak with their grandchildren face-to-face or via the phone (cell or landline) over text messaging or email. However, as the distance between the grandparent and grandchild increases, the likelihood that the grandparent uses SMS or email increases. Surprisingly, grandmothers were more likely to email their grandchildren than grandfathers (a finding that may be somewhat contradictory to most findings that older women tend to use ICTs such as email less frequently than men), but this may have been due to the fact that grandmothers tend to contact their grandchildren more than grandfathers and perceptions of the act of “calling” versus “emailing” in the survey and by the participants (Quadrello, et al., 2005). If a member of a family makes a telephone call, it is common to put a second family member “on the line” to speak for a few moments with the other person. It is possible that while this is perceived as “calling” the grandchild, a person who mentions that something should be placed in an email (or reads an email received) does not perceive themselves as “emailing” the grandchild, unless they are the person typing the actual email.

Quadrello et al. (2005) found that older adults were less likely to use ICTs such as email and texting than the phone or face-to-face, even if the older adults knew how to use and often used email and texting in their other relationships. This suggests a possible preference for a certain type of an ICT in their relationships with their grandchildren, even if these ICTs are used in other contexts of the grandparent’s lives. This is an example of a context-specific use/preference for an ICT. However, it is not clear for these older adults who use (or do not use ICTs) if their relationship with their grandchildren facilitated them in choosing to use the ICT in the first place. The second study that examined grandparent/grandchild relationships examined how these generations played

with each other both in face to face contexts and during long-distance relationships, using a prototype computer application that allowed individuals to share digital and digitalized photographs (Vetere, et al., 2009). This study also did not examine older adult's usage of other ICTs, or how their relationships with their grandchildren influenced their use.

The lack of gerontechnological research that examines the family surrounding the older adult is somewhat puzzling, as research in gerontology has shown that the family is an important part of many older adult's lives. Older adults tend to provide financial resources to younger generations in the family (Eggebeen & Hogan, 1990) and family members often help to care for older family members as they age (Belden Russonello & Stewart, 2001). What other research exists in this area has focused on helping family members to care for aging relatives using home healthcare devices (such as tele-health applications) (Ahn, Beamish, & Goss, 2008; Kearns, Rosenberg, & Applegarth, 2007; Kinney & Kart, 2006; Magnusson, et al., 2002; M. D. Rodriguez, Gonzalez, Favela, & Santana, 2009; Silver & Wellman, 2002; Washington, Demeris, Oliver, & Day, 2007; Willis, Demeris, & Oliver, 2007), but often does not address the older adult's own use, or the family's impact on the older adult's use.

### *Leisure*

Play is a critical part of our everyday lives and play is central to the consumption of media and the use of ICTs (Silverstone, 1999). Most of the research in domestication theory has focused on computers and their applications as entertainment and a source of literature, rather than including their use as a tool to facilitate other leisure activities. For instance, studies have examined the use of computer games in the household (Flynn, 2003) and whether children and adults see computers as instruments of work or leisure

(Singh, 2001). Previous research has demonstrated that some differences in gender perspectives are seen among older individuals, as women tend to be more likely to view computers as work and bringing work into the home, whereas men tend to view computers as both work and leisure (Buse, 2009). “Hacking” as a hobby among college students, and the culture of hacking in this subgroup, has also been explored (Håpnes, 1996). Domestication studies have not examined how individuals adapt the information or communication aspects of ICTs to enhance leisure activities that are not computer-based, such as digital communities where the products produced in hobbies are shown or tips on creation are shared or patterns downloaded.

In my previous work, I examined older adult’s usage experiences in a community center computer course. I observed that older adults used computers not only as leisure devices (for playing solitaire or journaling) but also to enable and facilitate their other hobbies (such as downloading free knitting patterns or communicating on message boards with others who shared their hobby) (Birkland, 2011). Several gerontechnological studies have studied leisure, particularly studies which focus on the use of e-learning as a leisure activity (Trentin, 2004) and computer courses as a form of leisure (Shoemaker, 2003; White & Weatherall, 2000; Xie, 2008a). Other studies have examined prototype ICTs designed for leisure activities (or to replace leisure activities for those with impairments) (Anger, 2005; Bickmore, Caruso, Clough-Gorr, & Heeren, 2005; Chen, Kobayashi, & Oh, 2005; DeGraves & Denesiuk, 2000). Leisure is considered an important aspect of older adult’s everyday lives. In fact, most people look forward to retirement as a period of leisure and rest (Buse, 2009; D. B. Smith, 2004). Although the use of computers as leisure activities in themselves is an important perspective, this study

sought to understand the wider usage of ICTs (beyond computers) both *as a source of leisure* and their use to *facilitate other leisure activities*.

### *Community and Citizen*

The community context includes tasks and relationships that occur because of volunteering and other community involvement. This can include involvement in church activities, governmental or political activities, and citizen roles (such as voting).

Domestication research has yet to explore this important context.

Volunteering is an important activity that many older adults are involved in. Based upon a survey of middle aged individuals, most idealized retirement as a time for leisure (62.8%) followed closely by those that believed that volunteering was essential to their ideal retirement (57.9%). 22.3% of respondents indicated that an ideal retirement included “other” activities (specified by the respondent) such as being more involved in religious organizations and religious outreach, being in good health, and various other responses (D. B. Smith, 2004). This emphasizes the importance that individuals give to volunteering and being involved in their community in later life. Being involved in the community through volunteering is also good for older adults’ health: research has shown that older adults who report volunteering 100 hours in a year’s time experienced slower declines in physical and mental decline than those who did not volunteer at least 100 hours in a year (Lum & Lightfoot, 2005). Indeed, most of the older adult participants in this study were active in their communities, often through volunteering.

Studies of older adults have shown that the introduction of electronic voting machines discourages older adults from voting (Roseman & Stephenson, 2005). Despite the importance of this context, very few studies have examined older adults’ usage and

exposure to ICTs in the community context. Therefore this study sought to examine how this context influences ICT use.

### *Work*

Work is an important part of everyday life for many individuals. In order to accurately understand how ICTs are being used in everyday life, we also need to understand how they are being used in paid work contexts, in addition to home life. Very few domestication studies have explored the context of work, or work's influence on ICT use in families (Lie & Sørensen, 1996). ICT transfer occurs between these two spheres of work and family life, both ways (Miles, et al., 1994). In other words, ICTs used in family life can be incorporated into work, and ICTs used in work can be incorporated into family life. It is likely that work is an important sources of ICT use, knowledge, exposure (introduction of ICTs), and both formal and informal technological support for individuals, and therefore an important context to study.

Studies have suggested that work is an important context of introducing ICTs into the home, because the introduction of portable electronic devices allows individuals to bring work into the home, often with negative consequences for other family members routines (Buse, 2009; Habib & Cornford, 2002). Buse (2009) examined the work/ leisure split in older couples (ages 57-88) in which one individual or both were retired. Buse found that among these couples, the computer was seen as mainly being a device of work (and not a device of leisure) and brought work into the home environment. Work can therefore be seen as an important introductory context of the computer into other life contexts, such as the home. Other studies examining work in the healthcare domain have indicated that the types of professional position held can shape attitudes and perspectives

on the usefulness and necessity of a medical device (Saetnan, 1996). Therefore, it is possible that not only does the work sphere introduce ICTs into family life (and vice versa), but the meanings of such ICTs may be different to various professions. However, with little data in this area it is difficult to predict if this will be true for older adults, or beyond the healthcare field studied by Saetnan. Compared to the literature surrounding the family domain, which has called for a clearer understanding of how relationships impact ICT domestication in families, no recognition of the potential for co-workers to impact ICT usage has been mentioned in the domestication literature. Therefore, this study sought to understand how this context, and the work relationships with others, influences the introduction, use, and routines surrounding ICTs by older adults.

Work remains understudied in the gerontechnological literature. In order to encourage more researchers to begin looking at the work life context, the previous ISG conference attempted to specifically explore the work domain, both in the sense of adapting the work environment to older adults as well as exploring work's impact on older adults (International Society of Gerontechnology, 2011). Very few research articles exist in the work domain, and none to date have examined how work impacts older adult's ICT usage in other areas of their lives. The literature surrounding work and older adult's ICT use has mainly addressed training older adults to use new ICTs (Bove, 1987; Charness, 2006; Charness, Kelly, Bosman, & Melvin, 2001; Charness, et al., 1992; Czaja, 2001; Larwood, Rodkin, & Judson, 2001; Larwood, Ruben, Popoff, & Judson, 1997), and the impacts of aging on older adult's use of ICTs in the workplace (Czaja, Hammond, Blascovich, & Swede, 1989; Czaja & Sharit, 1993; Elias, Elias, Robbins, & Gage, 1987; Sharit & Czaja, 1994).

The work context is increasingly being utilized by older adults who are choosing to remain in the workplace (Burtless & Quinn, 2001; Young, 2002). As society ages, workforces will need to maintain older workers in order to remain productive and fill necessary positions (DeLong, 2004; Hedge, et al., 2006). Understanding older adult's experiences with ICTs in the workplace and the influence of the workplace and coworkers on ICT usage and exposure helps us to understand the impacts this context has in older adult's lives.

Work is important to understand not only in terms of those who are currently working, but the role of being retired or having not worked outside of the home (such as in the case of stay at home parents and house-spouses)<sup>4</sup> could also impact ICT use. In the case of ICTs, many older individuals were not exposed to modern computer technology until late adulthood in the workplace. Once these individuals leave the work environment (retire), they will leave the social environment in which they receive free access, training, and support for emerging and developing technologies. In retirement, these individuals may be less likely or less able to seek out current technology and to update their skills than those of the generations still participating in the workforce. Additionally, many older individuals have not been introduced to advanced ICTs (due either to type of work position, due to not actively working, or due to personal choice). As suggested by Haddon (2000) retiring from work may actually result in changes in ICT use, suggesting a broader look to work status. Therefore it was important to understand how these different current work statuses impacted use. Beyond considering current work status, it

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<sup>4</sup> While it is very important to consider the role that being a "house-spouse" in general has towards impacting ICT use, for the Lucky Few birth cohort, the vast majority of "house-spouses" were female. This is due partially to stricter societal definitions of gender roles in the Lucky Few birth cohort than in following (younger) birth cohorts (Carlson, 1998).

was also important to examine the work trajectory of older adults, including the types of positions they worked (blue, pink, or white collared) and entry and exits from the workforce at various time points that influenced access and exposure to ICTs.

### *Gender*

A large portion of the literature on domestication theory has examined the impact of gender on usage within households. Many of these studies of gender have focused on use in multigenerational families, with a particular focus of gender impacts on the computer usage and parental regulation of such use by school-aged children. In these studies, it was shown that male children's usage tended to be focused on playing games, and parents tended to limit or otherwise regulate their usage, typically with either time constraints or using the computer as a reward for other tasks. Female children tended to use the computers less, for mainly homework related tasks, and parents did not place limits on their usage. This pattern of use and regulation was even seen within families with both male and female children (Habib & Cornford, 2002; Vestby, 1996). From that work, one can see that the usage (both how and how much) and routines (scheduling and limits) surrounding use are impacted by gender in families.

Although the majority of domestic studies have focused on families with young children, researchers have called upon other disciplines to examine more diverse people and settings as the theory can be used to study both individuals and families (Aune, 1996; Ribak, 2001; Stewart, 2007). In studies among middle-aged adults, gender has been shown to affect experiences with computers prior to adoption in the family, such as exposure in the workforce (Wheelock, 1994). This study focused on the "Lucky Few" birth cohort (born from 1936-1946). As a birth-cohort, these individuals experienced

differing sex-based educational curriculum in the K-12 environment and were also likely to hold sex-stereotypical occupations as a result (Carlson, 2008), which was found to impact ICT exposure.

In adults, gender has been shown to affect how adults feel about domestic technologies (such as washing machines and microwaves) and ICTs (such as VCRs). While women tend to emphasize the benefits of control that ICTs and household technologies give them, they tend to negatively rate technologies that they felt made them lose control. For instance, women tended to perceive ICTs that allowed recordings of programs as highly beneficial, as it allowed them to consume the content of the program at their leisure, giving them control over viewing. Women also indicated that they used and viewed ICTs as a way to maintain social ties. Men tended to emphasize the functionality of household technologies and ICTs (with more functions typically being seen as better), and tended to use ICTs as alternatives to having to interact socially with others (Livingstone, 1994). This emphasizes that there are differences in use between men and women as adults.

The findings from Livingstone's (1994) study regarding gender's impact on ICT usage are similar to Singh's (2001) study of the use of the internet in the home. Based upon her grounded study of 30 women in Australia, she found that the differences in internet technology usage and non-usage by women could not be explained by the differences in educational, technical skill expertise, the use of the internet at work, or rural or urban location. Women in her study tended to not view their usage of the internet as play or as trying to achieve mastery, but rather preferred to use internet technologies that they viewed as personal. Those who viewed an internet application as more personal

(such as email) were more likely to use that ICT than women who rated it as being less personal. This finding reinforces that gender influences how adults seek to use ICTs.

Several gerontechnology studies have also examined how gender has impacted older adults' ICT usage. The majority of these studies have examined the acceptance and first learning experiences of older adults when first introduced to using ICTs in classroom environments, either in community centers (Shoemaker, 2003) or through instructional programs in institutional dwelling populations (Sherer, 1997). However, it is important to note that in most of these studies, gender was not originally identified as a variable of interest and instead emerged from the data analysis as being an important influence. Despite gender emerging as a potential influence on use in several studies, the vast majority of studies on older adults tend to only mention the effects of gender in passing, and gender is seen as a basic demographic variable. This is a contrast to much of the work in domestication where gender is seen as a critical influencer on use; as ICTs are seen as reinforcing societal structures such as gender norms (Cockburn, 1994).

Studies of older adult computer learners have consistently shown that women tend to experience more self-reported issues when learning to use computers, and tend to be more likely to have lower self-confidence when it comes to the learning experience (Sherer, 1997; Shoemaker, 2003). Other studies of gender that are quantitative in nature have also emphasized these gender differences; demonstrating differences between older men and women on ratings of their computer skills (Marquié, Jourdan-Boddaert, & Huet, 2002), in their acceptance of home healthcare ICTs (such as tele-health monitoring devices) (Hanson, Percival, Aldred, Brownsell, & Hawley, 2007), and the ownership of computers as reported through surveys (Phang, et al., 2006; Reisenwitz & Iyer, 2007;

Reisenwitz, et al., 2007; Smither & Braun, 1994; Zeithaml & Gilly, 1987). Although these studies reinforce the importance of considering gender (particularly when it comes to the use, routines, and meanings of an ICT) they have not provided any substantial evidence as to how gender is shaping how ICTs are used and the resulting meanings for older adults. Although we know that fewer older adult women are using computers and tend to have more difficulties in learning about ICTs than men, we do not know much about how their actual usage is shaped by gender. Therefore, the focus on gender in domestication studies is complementary to studying the older adult population where gender has been suggested as an influence, but not fully explored.

In the case of older birth-cohorts, it is possible that the effects of gender may be more salient than for the younger birth-cohorts to which domestication theory has predominately studied. Older birth-cohorts were more likely to be exposed to different educational expectations and content as well as different occupational paths based upon gender than younger birth-cohorts. While this is not arguing that the effect of gender no longer exists, women and men are no longer taught separate and different subjects in high schools, a practice that was quite common in primary and secondary schools through the 1960s (Reese, 1995). It is possible, therefore, that the effects of gender on ICT usage could be even more profound in older birth cohorts where such gender differences were emphasized heavily in childhood, such as for the Lucky Few birth cohort studied. Gender's impact on profession type (blue, pink, or white collared occupation) was readily apparent in this study and dramatically impacted ICT exposure, particularly early ICT exposure in the workplace.

These life contexts, including tasks and relationships in each of these areas, impact the introduction, use, and display of ICTs by older adults. The next section of this paper discusses the meanings of ICTs, their display, and their impacts on life satisfaction.

### **Meaning of ICTs, the Meaning of their Display, and their Impacts on Life Satisfaction**

Domestication theorists have stressed the link between adoption and meaning, suggesting that consumption of any media should be understood in terms of individual and group understandings of technology, meaning-making, power-relationships, social influence, and societal participation (Livingstone, 2007). Hubak (1996) explains that while use is often impacted by the external structures of the context and society, the symbolic value of using and owning an item is created by individuals internally. ICTs are not just objects, but they carry messages and provide links beyond the home into the wider world. People buy ICTs for both aesthetics and function, suggesting their power to develop meaning (Silverstone, et al., 1994). ICTs have biographies- they have historical and cultural stories (Silverstone, et al., 1994). Their meanings can evolve over time. For instance, the computer was originally seen as a toy to play expensive games; but this meaning has evolved as technology has developed and individuals have found uses in addition to just gaming (Haddon, 1994).

For technical objects, advertisers often tend to try to build socio-technical scripts which detail the users, the attitudes, and the values that are connected to the product. Essentially the advertisers are trying to create meaning for potential users of a product. These products are seen as shaped by the advertising that accompanies the product to

market, such as in cars. Advertising for cars is aimed at young people, as it is thought that advertising towards young people will appeal to all age ranges. Advertising towards older adults is seen as only appealing to older adults, and stigmatizes the product to younger people, despite the fact that older people purchase most cars (Hubak, 1996). This is an example of how meanings are often attempted to be set by the producers of ICTs in the public sphere, whereas they require meaning to individuals in the private sphere of the home and family (Silverstone, et al., 1994).

Since meaning of ICTs is seen by domestication researchers as occurring in the context of the home, some have argued for re-defining the home as the digital hearth. In the typical home, ICTs are often placed (and designed to) stand out and be the center of many rooms. Hence, ICTs (such as televisions) have replaced the hearth (fireplace) as the center of many rooms and the home in general (Flynn, 2003). This display indicates the importance of the arrangement of objects in the home, and in particular, the display of ICTs. However, as Flynn notes, each families' design and viewpoint of the digital hearth and their reaction to new ICTs is different.

Domestication research that has examined meanings has mainly done so in the contexts of the family, and in particular, use of ICTs by children and their impacts on family life and meanings. The table below briefly summarizes our knowledge about meanings of ICTs, their display, and impact on life satisfaction, as well as gaps within the literature. It is important to note that no gerontechnology literature has examined the meanings of ICTs to older adults. Following this table, the literature is then examined in-depth.

**Table 2.3 Findings and Gaps in the Domestication and Gerontechnology Literature: Meanings of ICTs, Meaning of ICT Displays, and ICTs' Impacts on Life Satisfaction**

	Meaning of ICTs	Meaning of Display	ICTs and Life Satisfaction
<b>KNOWN:</b>	ICTs hold different meanings to different populations	ICTs are often centered in home	ICTs can change individual's views of their roles in the family
<b>GAPS:</b>	No literature on the meanings of ICTs to older adults	No literature on the meaning of displays of ICTs to older adults	No literature empirically linking ICT use to life satisfaction
	Focus on meaning of single ICTs (mainly cell or telephone)	No literature on display of ICTs outside of the home	

Studies in domestication have shown that teenagers use cell phones to exert their independence and defiance of paternal rules. For example, female teenagers in Palestine use cell phones given to them by their boyfriends to maintain their relationships, even if their relationships are forbidden by their parents. Having a cell phone holds meaning as a form of defiance (Hijazi-Omari & Ribak, 2008). To the Amish, the telephone comes to represent an intrusion into daily life and a source of gossip. Therefore, most Amish communities do not have telephones within their homes and limit the telephones use (Umble, 1994). Both of these findings of the use of the telephone is much different than Vestby's (1996) finding that telephones came to be instruments that allowed parents to monitor their children's behavior while they were away from the home, thereby creating greater independence for the adult. Studies on meaning have also determined that men come to view the computer as new and foreign object in the home; seeing their children, male children in particular, as experts. In many ways, this leads to the men feeling that their role as parental expert has been damaged, as it reverses the flow of information from

parent to child to child to parent (Ribak, 2001). These differences in findings indicate how the meanings of ICTs are influenced by context and relationships.

It is important to understand how ICT consumption impacts social relationships (Hirsch, 1994). Researchers have suggested that future domestication studies should address what happens when individuals differ on their meanings, values, or objectives regarding technologies. In particular, research should examine how these conflicts are remembered and affect the relationships and the technologies (Putman, 1994). Although the gerontechnology literature has conceptually linked ICT use to life satisfaction, this has not been empirically validated. For the purposes of this study, possible conflict was explored by examining the expectations for older adult's usage through interviews with individuals in their personal network. The literature on ICT use expectations is explored in the next section.

### **Expectations of ICT Use**

Rama, de Ridder, and Bouma (2001) suggest that the ICT devices available to individuals in their childhood and adolescence strongly impact the birth cohort's perspectives concerning use and norms regarding newer ICTs. Because birth cohorts that interact with a developing ICT in their youth determine the norms regarding that ICT, cohorts who are older or younger must either adopt the norms of that cohort for that ICT device, or be considered ineffective or non-users of that ICT. Technological generations theory suggests that birth-cohorts develop specific frames of reference for ICTs (Larsen, 1993). It is possible that these technological frames about ICT use shape older adult's expectations for their own use, as well as their expectations for other birth cohorts. The

table below indicates some of what we know from the literature on expectations and ICT use, as well as the gaps in this literature.

**Table 2.4 Findings and Gaps in the Literature: Expectations regarding ICT Use**

	<b>Expectations</b>
<b>KNOWN</b>	Coworkers tend to conform to other's expectations
	Older adults internalize stereotypes, tend to underrate own knowledge
<b>GAPS</b>	Unclear what other's expectations are for older adults
	Unclear if older adults try to conform to coworkers, friends, or family expectations

While individuals have expectations of their own ICT use, others also have expectations of the same individual's use. Almost nothing is known about others' ICT expectations for older adults and the effect of these expectations on the older adult's life. Research on workers has demonstrated that coworkers' expectations for ICT use influence their fellow coworkers' use, even if these expectations are not internalized. In other words, even if people do not come to hold the same expectations of their own ICT use as their coworkers, individuals tend to conform to the use expectations of their colleagues (Gallivan, Spitler, & Koufaris, 2005). Previous research has shown that older adults can internalize stereotypes regarding ICT usage, and therefore may underestimate and their actual use and underrate their skills (Marquié, et al., 2002). However, as Gallivan et al. indicate, it is possible that despite holding these internalized stereotypes, older adult's usage could be influenced by others' expectations for their use. However, we have no research to understand others' expectations of older adults ICT use. In order to fill this gap, this research sought to interview members of the older adult's network to understand their perceptions and expectations of the older adult's use.

Livingstone (1994) has suggested that it is important to understand the effects of ICTs on family cohesion and relationships. It is possible that conflicts in expectations between the older adults and others cause difficulties for older adults in their various life contexts. Therefore, this research also sought to understand if such differences in expectations existed, and if so, how they impacted the older adult's experiences in different life contexts and the overall satisfaction they feel in their lives.

### **What is an ICT?**

Since this study examines ICT use and the meanings attributed to it, it is important to explore what an "ICT" is in the minds of those studied. While a practical definition of what an ICT "is" was provided in the first chapter, the true definition of an ICT is more nuanced and complex. ICT use becomes part of our routines, rituals, and traditions (Silverstone, 1994). ICTs become important to individuals because they become an extension of their identity and allow them to interact with the world, obtain information, and communicate with others (Silverstone, 2007). ICTs are socially constructed, the use and design of ICTs takes place within the economic, social, and institutional frameworks. Any ICT has values and assumptions built in, which predetermine use to a certain extent (Quintas, 1996). ICT production and development is shaped by politics, costs, manufacturing specifications, and geographic location of the producers (Cockburn, 1994). However, not all ICT use is strictly coded and determined by the designers. For instance, software allows redesign (not just innovation in use of existing capabilities) such as through reprogramming (Quintas, 1996).

ICTs are culture and our definitions of ICTs are culturally determined. ICTs expand beyond the "what" of a machine, but also the why and how of use: the functional

use and the symbolic practice of use and non-use (Kaarst-Brown, 1995; Silverstone, 1999). ICTs do not so much shape people, as people shape and integrate ICTs into their behaviors (Haddon, 1994). Individuals not only are active consumers of ICTs, but they choose how they consume them, bring their own experiences to them, and take their experiences with them away; therefore transforming ICTs into cultural benefits (Kaarst-Brown, 1995; Stratham, 1994).

One of the most complicated aspects of an ICT is that it represents not only a ICT form (such as television versus the internet), but also that it contains a message (such as the type of program) that is influenced greatly by the context of the individual (Livingstone, 2007). Therefore, the form, content, and context all interact to make meanings of use different for different individuals and cultures. For instance, the same ICT of the landline (the ICT form) has very different meaning for the Amish than for the general population (context): for most people in the U.S. the telephone is seen as bringing individuals together (bridging distances) while to the Amish the telephone is seen as a separating individuals (creating distance) (Umble, 1994). This becomes even more salient in Miller's (1994) study of the watching of U.S. soap operas in Trinidad: the ICT experience is not only the ICT form (television), but the message (a fictional drama), and the context (the social meanings surrounding watching the soap opera and being a watcher of the soap opera). Overall, the importance of the U.S. soap opera in Trinidad is quite different from the importance of the same soap opera in the U.S. In Trinidad, the soap opera is an important media form watched by almost everyone; unlike the U.S. where the soap opera is seen as a media form consumed mainly by women who stay at home or are retirees. Although the vast majority of people in Trinidad watch soap operas,

the meaning of the soap opera to individuals in different socio-economic levels of the society are different: based upon their personal context and interpretation of the message of the soap opera. Therefore, even though the message and form are the same between the U.S. and Trinidad, the context influences the interpretation and the meaning of these soap operas to individual's lives.

ICTs, in addition to having these three aspects, also have dualistic natures. ICTs are both globalizing and localizing. ICTs globalize culture, bringing outside culture into local environments, yet are also themselves transformed by local cultures (Silverstone & Hirsch, 1994; Silverstone, et al., 1994). ICTs have tended to reinforce the boundaries of countries and social patterns, rather than resulting in the dissolution of societies (Silverstone, 2007).

ICTs also connect the global world to the individual, and help the individual to present themselves to the outside world. The messages that these devices transmit connect a household to the national and international culture, while also allowing individual households and their members to exert their own identity through their use (Silverstone & Hirsch, 1994). ICTs also are dualistic in their ability to connect us to others. They allow us to be more disconnected to others (we can receive messages without having to give a response as we would have to face to face) but they also allow us to communicate beyond previous limits of distance and temporality (Silverstone, 2007). Therefore, ICTs are seen as dualistic or even pluralistic: they have many uses, meanings, and consequences. There is not a single outcome from an ICT.

New ICT forms have also blurred public and private space, and creator and audience. For instance, iPods allow media content to be consumed publically in a private

way. The use of such devices suggests that private space and private consumption is prioritized. Additionally, ICTs that were once limited in the flow of information and media from the producers to the public now allow individuals to share their own personally created media content with others (Livingstone, 2007).

When considering ICTs and older adults, it is important to understand some of the social issues surrounding who is considered a user. ICTs and other products tend to be created for and advertised to children and young adults, even if older adults are the main market as far as the purchasing of such items (Hubak, 1996; Millward, 2003). ICTs tend to be seen as tied to the birth-cohorts that are young when they are introduced. When a young birth-cohort of individuals is exposed to an ICT in its initial stages of development, these individuals will have the greatest impact upon how an ICT is viewed by all of society. This includes the norms and conventions for appropriate use, how the ICT is viewed, and who is considered a user of the ICT. A birth-cohort develops an ICT frame based upon their interactions with developing technology during their childhood that will influence their ICT interactions throughout their lives. These ICT frames influence not only how a user views ICTs, but how they believe an ICT should be used, including the norms surrounding technological use for members of the same or other birth-cohorts. This perspective has been referred to as technological generations (Larsen, 1993).

The introduction section of this document provides a very practical definition of ICTs for the purposes of this study. But it is important to keep in mind that what is considered an ICT differs from individual to individual. Very few studies have explored what older adults consider ICTs. What is considered an ICT by an individual is

influenced by cultural and birth cohort perspectives, which have not been explored fully in the literature.

### **Assumptions of the Domestication Theoretical Perspective**

It is important to understand the assumptions of any theory used in a study. The assumptions of domestication theory include:

1. ICTs are a central part of daily life in the home (Lie & Sørensen, 1996).

Therefore, it was assumed in this study that older adults are exposed to, and are users of many ICTs in their daily lives. However, people have a broad range of actions with any form of and ICT; there are no set uses. ICTs do not solely determine people's actions (Lie & Sørensen, 1996). Therefore, this study expected and found diversity in the uses of ICTs by older adults.

2. ICT consumption is not passive, but an active process in which people adapt ICTs to meet their own needs and lifestyle. Hence, resistance to ICTs can be seen as an attempt to transform technology to meet their own needs. This adaption is not just in the practical sense to complete tasks, but also in the emotional sense (Aune, 1996; Lie & Sørensen, 1996).

3. Domestication occurs in everyday life in many different contexts (Silverstone, et al., 1994). The focus of this study was on "everyday life," including the contexts of community, family, and work. Everyday life is seen as the "social space which the individual citizen is able to oversee and manage" (Lie & Sørensen, 1996, p. 15) as opposed to larger society, on which a person has very little impact. The inter-relationship of these domains, work, family, and community is particularly

important, because technologies cross these contexts in our lives, just as our lives cross these contexts (Miles, et al., 1994).

4. ICTs are embedded in larger culture, included in the values, perceptions, history, and discourses of that culture (Balen, 2010). Social and technical changes are interwoven (Vestby, 1996). This study viewed ICTs and their use as embedded within the individual's historical and personal contexts. In order to explore this, the study used an interpretive dialogic method that includes an emphasis on present and past history, both personal and societal.
5. ICTs can acquire meaning to individuals. Once an ICT has meaning to an individual, its use or non-use, display or non-display becomes an expression of self. New ICTs do not necessarily replace old ones, but rather old ICTs may acquire new meanings and therefore self-expression. A single ICT can acquire many different meanings, as ICTs are used in many different contexts (Silverstone, et al., 1994). The meanings assigned to ICTs are relational and are defined in terms of other people and the meanings we assign to these people (Cockburn, 1994). Social groups often exert control over technology use and its meanings (Umble, 1994). The socially constructed meaning of an ICT may vary drastically from one individual, family, or social group to the next. For instance, the Amish view a telephone as replacing face to face contact (and therefore separating people) while most in U.S. society view the telephone as bringing people closer together (Umble, 1994).

The next chapter of this paper describes the comparative case studies methodology used to explore the process described in Figure 2.1 and the research questions discussed in chapter 1.

### **Chapter 3 : Methods Section**

This section details the intensive interpretive case studies methodology used to study the ICTs, the meaning of those ICTs, and the expectations of ICT usage by older adults in their everyday life. To begin, this chapter examines the researcher as the instrument and the logic of using an interpretative comparative case studies design to examine the research questions outlined in Chapter 1. The following sections examine the case sample and sampling logic, the data collection methods, and the data analysis methods used.

#### **Researcher as the Instrument**

Case studies require the researcher to recognize and avoid allowing personal and professional biases to color their interpretations of the cases studied (Yin, 2009). As Denzin (2001, p. 3) describes, “the researcher is historically and locally situated within the very processes being studied. A gendered, historical self is brought to this process.” Since the researcher is a research instrument in interpretative work, it is important that I outline some of my own experiences and thoughts about this topic. This was something that I worked extensively on before starting the study, during the data collection and analysis, and also during the writing of this document. Much of what we study as researchers is motivated by personal or professional experiences in our own lives. Denzin (2001) argues that rather than seeing such biases as a liability, they can motivate and lead the researcher to sound and important research and findings. Discovering such biases and values are critical before entering the field, as these values and morals are reflected in the

choices that researchers make within the field, during data analysis, and in reporting the results.

I became interested in older adults and ICTs through my work in community-based volunteer organizations in 2003. In many of these organizations, a significant population of their volunteer base was made up of older individuals. Many of these organizations were at the time updating to more digitalized systems: emailed newsletters, electronic data entry, and other forms of office automation to cut costs. This automation was intended to be financially beneficial to the organizations that implemented it, but often came at the price of excluding the older adult volunteers who did not have the skills to use these systems or their outputs. If calls to volunteer for specific events only were sent via email, and a volunteer did not have access, this volunteer was unable to participate. Many of these volunteers had given a huge portion of their time to these organizations (many volunteered full-time), and found themselves suddenly excluded. This for me served as what Denzin (2001) refers to as an “epiphany,” a series of events that dramatically altered my viewpoint on the world and the path I have chosen to follow and focus on in my research career.

I was probably more sensitive to this process and the challenges of ICTs than most. Growing up in a rural school district with limited resources, my experiences of using a computer were mainly limited to using the newly digitalized card catalog on my high school library’s single computer (which ran Windows 3.1). My first extensive use of a computer happened in the fall of 1999, when as a college freshman I unpacked my new desktop computer, a Windows 98 machine. Having never used such a new operating system, I became stumped as to what my next move should be to actually bring up a

program or to access the internet. After several perplexed hours, I had to ask my Resident Advisor (another college student who supervised the dorm residents) how I could launch the programs on the machine. It was only through much persistence and the guidance that I learned to use the operating system. Compared to many of my peers the same age, my skills were woefully inadequate and the cause of much frustration and embarrassment. As a young person, I was expected not only to be fluent in digital ICTs, but that such use would come naturally and be automatic to me.

Well aware of these challenges in using computers and sensitized to the issues regarding older adults whom lacked computer skills, I used one of my first research opportunities to understand the issues surrounding novice technology users in an older adult-only computer course at a local community center (Birkland, 2011). During my community center research, I came to see ICTs as what Silverstone, Hirsch, and Morley (1994) refers to as dualistic; and to understand this dualistic nature in my own life. While an ICT could facilitate an older adult's participation in society, I also saw how ICTs could become significant barriers for others. During my study, I saw women and men who were able to actively participate in pursuing their hobbies and interests due to plethora of information and hobby-based communities on the internet. I also observed many older workers, laid off just before retirement, who came to the course because they found that not having basic computer knowledge limited them from obtaining the part-time minimum-wage jobs that they desperately needed. While these ICTs allowed some to pursue hobbies and self-actualization, for others the same ICTs prevented them from participating in the basic tasks needed for survival our society. I have come to believe that ICTs are neither purely tools of empowerment or disempowerment, but can both

empower and disempower individuals depending upon the context of the individual. In many ways, I have come to see many parallels between my young life and that of older adults: failing to meet the expectations regarding usage at either end of the age spectrum often results in a person being treated as an anomaly and strange.

During these preliminary studies, I conducted several semi-structured interviews of older adults and obtained several life histories (Birkland, 2011). While the semi-structured interviews often only lasted a few hours, the life history interviews often went over four or five hours. A quite memorable interview for me was sharing the life history of an 89-year old woman who had come to the computer course two years earlier. Her original goal was to use a computer to simplify her life through using e-Bay and a digital camera to sell her deceased husband's large book collection. In the course of exploring her relationship with ICTs and technology throughout her life for over seven hours, I was able to learn about her instrumental involvement in the unionization of a steel mill, the impact of a car crash on her family life, and how she believed her upbringing established her outlook on life and ICT use. This initial study not only reinforced my interests, but also allowed me to practice using many of the methods (such as semi-structured interviewing) that I used during my dissertation work.

While I recognize the diversity of older adults' life trajectories, much of my research (including this dissertation) was motivated by my desire to give the older population a voice through my research. I believe that the voices and perspectives of older adults are important, and are often ignored or (in the very least) not given an equal voice in greater society. Compared to research that examines other subsets of the U.S.

population and ICT usage, there is still comparatively little research that examines older adults and ICT usage (Birkland & Kaarst-Brown, 2010, 2011).

Denzin (2001) recommends that researchers consider not only the scientific literature on a topic, but how the folk literature surrounding the phenomenon of interest can influence the researcher's bias and values. There is a large part of everyday literature that emphasizes the "problems" of an aging society, often relying heavily on stereotypes about older people's motivations, aging, and perspectives on life and politics (Hedge, et al., 2006). For instance, an opinion article in the L.A. Times suggests that as the United States becomes "Floridarized" (ages), our population and our national policy will become less forward thinking and more depressed (G. Rodriguez, 2010). Such articles play off of stereotypes about older adults as being depressed, self-serving, and unable to adapt to change; none of which has been proven through research (Hedge, et al., 2006). Although I do believe that there are challenges in our aging society, particularly challenges surrounding benefits for older adults, healthcare, inclusiveness and transportation, these challenges are neither insurmountable nor any different than the other challenges facing our society. I find such ageist articles that emphasize the negatives and present stereotypical older adults extremely upsetting. From this perspective, I tend to be attracted towards both cases that show that these stereotypes are untrue, but also those who I feel have been disenfranchised by greater society.

Through extensive journaling about my biases and thoughts throughout the research process, I hoped to counteract what may be my tendency to more greatly portray or more highly weight the experiences of the empowered or disempowered while giving lesser weight to those that are neither (or a mix depending upon the life context being

discussed). Bentz and Shapiro (1998) suggest that daily journaling about the biases and thoughts of the researcher is valuable in understanding how these may impact how the researcher is collecting and analyzing data. Much of the literature on older adults and ICT usage concentrates on one of these two types of cases (Selwyn & Gorard, 2008), and one of my goals was to determine not just the cases of ICT empowerment or disempowerment, but those cases that are in-between: those that are neither “empowered experts” or “disenfranchised and excluded,” but perhaps unaffected, or feel empowered in one aspect of their lives and disenfranchised in another.

As a result of the intensive nature of the research, I often spent many half days with my participants. It was easy to blur the lines between the research relationship and a potential friendship that was developing, even if I as the researcher was aware of this blurring and tried to keep the relationship professional during the course of the study. This is something which I have chosen to address more fully in the final chapter, in which I reflect on the method used as well as my role as researcher.

### **Basis for Choosing an Interpretative Case Study Methodology**

This study used a series of intensive interpretative comparative case studies to understand what technologies are being used in older adult’s everyday lives. These case studies were interpretative in nature, using a form of dialogic interpretation in order to understand the meaning of ICTs to older adults. Interpretation, at the most basic level, involves two hermeneutic cycles: the participant is at the middle of their own understanding of an event, while the researcher is at the center of their own interpretation of the same event. These two circles interact, and if the researcher is successful, meaning is shared between the two individuals (Denzin, 2001). Interpretative studies allow a

researcher to observe a phenomenon and build theory from the stories and events that occurred, and to understand the meaning such events hold to participants (Denzin, 2001). Such a dialogic interpretive type of study was well-suited to understanding how older adults are using ICTs in their daily lives, because little theory has been produced in this area (Birkland & Kaarst-Brown, 2007; Birkland & Kaarst-Brown, 2011).

This study sought to show how older adults use multiple ICTs across many different life contexts: work, leisure, family, and community. Although several calls have been made to study these contexts by gerontechnologists (Bouma, et al., 2007; van Bronswijk, et al., 2002; van Bronswijk, et al., 2009), most studies have been limited to studying a single context (Birkland & Kaarst-Brown, 2007; Birkland & Kaarst-Brown, 2011). In the literature, there has been very little research on the work domain (Birkland & Kaarst-Brown, 2011), the use of ICTs across all of these domains, or the meanings of ICTs to older adults. Research has also tended to focus on the use of a single ICT, such as the internet, or email (see for example (Adler, 1996; Blit-Cohen & Litwin, 2004; Cody, Dunn, Hoppin, & Wendt, 1999; Eastman & Iyer, 2004)). While such studies have provided society with helpful information about the use of very specific ICTs in very specific situations, we do not have any studies that have focused on the variety of ICTs used in these contexts. Interpretative studies are well suited to such areas of study where the purpose is to examine and show the entirety of a phenomenon (Denzin, 2001) (in this case the use of multiple ICTs across multiple contexts) rather than a mere slice (such as the use of a single technology in a certain aspect of a person's life).

In particular, interpretative studies are important when deeper data collection is considered important to answering the research questions. Such deeper data collection is

necessary when the researcher is seeking to understand meaning of objects and perspectives to participants from their own perspective (Denzin, 2001). Since the purpose of this study was to explore the meaning of ICTs and older adults' perspectives on their use in their everyday lives, the depth provided by the interpretative approach was necessary.

The comparative case study methodology was well suited to this dissertation, as case studies are one of the most powerful methods to letting us examine the rich, complex, real everyday contexts of individuals (Flyvberg, 2006; Yin, 2009). Case studies allow a researcher to study what Flyvberg (2006, p. 223) describes as “nuanced reality” or how contextual factors influence a phenomenon. The research questions of this study-- how older adults are using ICTs and the meanings they ascribe to their usage within different aspects of their lives-- required an understanding of the context-rich nature of their everyday lives that case studies can reveal.

As has been stated previously in this document, the research surrounding older adults and ICT usage has not included studies across many different life contexts of older adults, and therefore little research can shed light on this phenomenon (Birkland & Kaarst-Brown, 2007; Birkland & Kaarst-Brown, 2011). With little previous relevant literature to this area, it was difficult to predetermine the contextual variables that could influence usage, expectations, and meaning at the outset of this study. Case studies do not require researchers to predetermine which contextual variables are important or critical (in the case where many variables have been proposed but not studied) (Flyvberg, 2006). In the case of the literature surrounding older adults and ICT usage, many variables have been proposed to impact adoption, including income and ethnicity (see for example

Kamal and Patil (2003) and Stark-Wroblewski, Edelbaum, and Ryan (2007)). However, many of these variables remain unstudied and untested, which made the case study approach useful for this study. The theory of user types (presented in Chapter 4), the main and most significant contribution of this work to our knowledge about older adults and ICT use, could not have been discovered if not for the power of the case study methodology to understand and capture these contextual variables.

For this study, several data collection methods were used, in order to better understand and triangulate the meaning and expectations regarding ICT usage by older adults. These methods will be discussed at length later in the document. They included intensive interviews with older adults, a few observations/ interviews that occurred during technical help sessions with older adults, interviews with individuals they have relationships with, and analysis of documents. This triangulation of multiple methods, a strength of the case study approach (Yin, 2009), was necessary to understand the introduction and differences in expectations regarding ICT usage for older adults.

There are many flavors of interpretation, including phenomenological, feminist, and symbolic interactionism studies (Denzin, 2001). For this study, interpretative interactionism was chosen. This is a dialogic form of interpretive research that seeks to understand (interpret) meaning, report (show) perspective and events, and promote change and empowerment of individuals to promote a more democratic society (Denzin, 2001). This study seeks to apply the interpretive interactionism perspective in order to interpret and understand events and their meanings to participants.

Interpretative interactionism seeks to understand the meaning of phenomenon through the contexts of not only present time, but also through the perspective of history

and biography. History impacts the meaning of events to the individual in several important ways, the events being studied occurred during a particular time period within a larger social and historical structure. Personal history (also referred to as biography) also impacts a person's perceptions and meaning making of the event (Denzin, 2001). Many of the contextual variables that have been proposed in the literature to impact older adult ICT usage are contextual and historical in nature, including income, work history, and social relationships. These rely heavily on the biography and history of the individual. Because of this dialogic method's focus on the past and present, it was well suited to identify the factors that emerged as being important to understanding how ICTs are used in different contexts of older adults' lives. It was only through the deep exploration of meaning and the participant's own personal history that the findings in this study were possible.

With the reasoning of this dialogic, interpretive comparative case studies approach established, it is important to consider the assumptions of these approaches, and the assumptions of this study overall.

### **Assumptions of this Approach**

Researchers must understand their own assumptions and those of the conceptual framework and methods which organize their work (Wengraf, 2001). There are several assumptions of the interpretive approach that I have outlined in this document. These include assumptions about the research environment, the role of the research, and the knowledge obtained.

One of the most critical assumptions of interpretative research is that all research is value-laden. In other words, all research (and more generally all human action) is

motivated and impacted by the values, morals, and judgments of those involved (both the participants and the researcher) (Bentz & Shapiro, 1998; Denzin, 2001). This is in contrast to positivism, where it is believed that objective truth can be found and value-free research can be conducted (Bentz & Shapiro, 1998). Therefore it is critical that a researcher outline their values and perspectives throughout the research process (Denzin, 2001). Memoing about my own biases and thoughts throughout the research process was valuable not only to informing me about how I was thinking about the research problem, but also aided significantly in analysis and writing.

People make value judgments, act, and develop meaning in a complex environment (Bentz & Shapiro, 1998; Denzin, 2001). The context of the individual is important in the development of the individual's perspective. As a result of shared contexts, objects and events can come to have shared meaning to individuals, groups, and communities. As a result of the importance of context, it is difficult to predict these meanings in advance: researchers must interact with participants to understand these meanings. The interpretative approach assumes that this meaning can be obtained through dialog with other individuals. In order to obtain and understand this meaning, the research environment must be participatory and collaborative, resulting in a give and take dialog between the researcher and the participant (Denzin, 2001).

Finally, the interpretative interactionism approach assumes that an individual researcher wishes to empower others in society and that they must use their research to show disempowerment and power relationships. Beyond the world of research, the researcher must be involved in the greater world to call for change, based upon the findings of their research (Denzin, 2001).

With the reasoning for the usage of an intensive, interpretive, dialogic case study defined and this approach's assumptions defined, it is now important to understand the case sampling methodology that will be used in this study to understand older adult's usage, meaning, and expectations of ICTs in their everyday roles.

### **Overview of the Study**

This study used 17 interpretive case studies to explore older adults' ICT usage, display, and meaning. Each case study ideally consisted of an older adult (primary participant) and 2-3 individuals in that person's network (secondary participants).<sup>5</sup> Each primary participant was interviewed three times and each secondary participant was interviewed once. Analysis occurred at several levels of the study. A summary of the number of participants, interviews, and analysis occurs in the table below.

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<sup>5</sup> Ideally, each case consisted of three interviews with the primary participant and also single interviews with 2-3 members of their social network. For one of these cases, Cleveland, the primary participant was only able to sit for one interview. Three other cases (George, Jackie, and June) did not have secondary participants due to these individuals having relatively small social networks or secondary participant refusal to participate in the study.

**Table 3.1 Diagram of the Study, Number of Cases, Data Collection, and Analysis**

<b>Participants and Method</b>	<b>Description</b>	<b>Number of Interviews per Case</b>	<b>Totals</b>	<b>Analysis</b>
<b>Primary Participants:</b> Interviews with Older Adults	One-on-one semi-structured interviews with older adults	3 interviews per older adult	17 Cases (49 Total Interviews with Older Adults)	Several levels of analysis (dialogic method and analysis): -From interview to interview within each case (older adult) and across life contexts -Comparisons in expectations between the older adult and their networks -Between cases (comparing between cases of older adults); both literal and theoretical comparisons -Across cases to determine emergent variables
<b>Secondary Participants:</b> Interviews with members of the Older Adult's network	One-on-one semi-structured interviews with 2-3 members of network; Snowball sampling with referral provided by the primary participant	2-3 interviews per case	17 Cases (32 Total Interviews with Secondary Participants)	

The next section of this paper discusses the selection of these cases.

### **Case Sampling**

Each case in this study was comprised of an older adult (referred to as a primary participant) and 2-3 individuals whom they identify as being important relationships (referred to as a secondary participant). Primary participants ranged in approximate age from 65 to 75 years of age (born from 1936-1946), who lived in the northeastern United States.

Originally, it was conceptualized that all of these older adults would be community dwelling and not members of assisted living or nursing home communities. However, during the course of the research process, the researcher was approached by several individuals living in a local assisted living center who wished to participate (only one individual qualified for the study due their birth cohorts). The researcher had originally wanted to avoid selecting participants only from institutional communities, a

weakness in previous research on older adults and ICTs, as much prior research focuses only on institutionalized older adults (Birkland & Kaarst-Brown, 2010). However, the researcher realized that including a few participants from an assisted living community might result in possible interesting comparisons between community and assisted living dwelling older adults. In many ways, the one primary participant from the assisted living center who participated in the study (Nancy) differed from the community dwelling participants only in the fact that she called a local assisted living center her home. Upon reflection, this was not a satisfactory reason to exclude her from participating, given the potential insight she could lend to the research, particularly when it came to functional issues surrounding ICT use. Since the researcher was not seeking out or only recruiting participants from institutionalized settings, the researcher rationalized that she was avoiding the over-selection of institutionalized older adults typically found in previous research studies.

The age range of 65 to 76 was selected, as representative of the younger members of a single birth cohort, often referred to as the Silent Generation or the Lucky Few (Carlson, 2009). Therefore, participants of this study will have been born in the years 1936-1946. (The age range given accounts for the fact that data collection occurred over the years of 2011 and 2012.) These individuals were born before the “baby boom” of the late 1940s through the 1960s, yet were too young to have been involved in the military during WWII (Carlson, 2009). As a cohort, they were often labeled “lucky” because they were younger during the Great Depression and also too young to serve during WWII. Male members of this generation benefited from educational advancements such as the GI bill (while serving mainly in peacetime), females also experienced gains in

educational levels, and both sexes experienced more intact families during childhood than any other birth cohort (Carlson, 2008).

This specific 10-year age range was also chosen because it represents a birth-cohort that has reached that traditional age of retirement in the United States (age 65), so therefore some of the sample had retired. However, because they are “young” older adults, many of these individuals were still working (part or full time). Younger older adults are more likely to be employed than older older adults (Bureau of Labor Statistics, 2011). Work was an important theoretical case selection variable, so capturing some individuals who were working was important to this study.

#### *Case Sampling Frame*

In this study, I completed a series of literal replications of these cases, where it was expected that the results would be similar. Theoretical replications were also sought where it was expected that contrasting results would be found based upon anticipated reasons. These cases were selected for theoretical basis, not based upon sampling logic, as the purpose of the study was to build theory and not to provide a comprehensive and exhaustive study of the complete range of ICT usage in the older adult population (Yin, 2009). The two theoretical constructs chosen as case sampling criteria were gender and work.

Gender (Male or Female) has consistently been shown in the literature studying older adults and ICT usage to have a significant impact. Such findings have indicated that women tend to encounter more difficulties in learning to use computers in the same settings as men (Hill, Beynon-Davies, & Williams, 2008; Ng, 2008; Shoemaker, 2003). Domestication theory has also suggested the importance of gender, demonstrating that

men and women use technologies for drastically different purposes- men often use them to escape from the world and avoid interaction with others, while women tend to use technologies and view them as ways to engage and interact with others (Livingstone, 1994). Gender (male or female), therefore, was an important theoretical construct upon which cases were selected. Ten female cases and seven male cases were collected.

A second case sampling variable was work. The impact of work has been shown in the domestication literature to impact which technologies are used at home, as well as which technologies individuals have access to (Lie & Sørensen, 1996). However, in the gerontechnology literature, the work environment has remained drastically understudied (Birkland & Kaarst-Brown, 2007; Birkland & Kaarst-Brown, 2010, 2011). Domestication research has indicated that retirees feel that their telephone usage increased after retirement, suggesting that there may be differences between retirees and those who are still working (Haddon, 2000). Workplaces have increasingly become automated, with many positions requiring computer and/or other technology skills (Hedge, et al., 2006). Being involved in paid work can provide exposure as well as vital support for learning new technologies. In the typical work environment, workers receive access and exposure to ICTs necessary for work (including sometimes being given such ICTs to take home or to use outside of working hours- such as laptops or cell phones), technical training, and both formal (employer provided) and informal (peer) technological support. Therefore, the working environment is a critical point of introduction of new technologies. In order to understand how work roles influenced technological use, it was important to ensure that several older adult cases were working. (For the purposes of the study, work was defined as paid work for a single entity/organization on a weekly basis.) Three levels of

work status were considered for this study. Older adults could be working (participating in paid work), retired (older adults no longer participate in paid work for an organization), or have stayed at home (having not participated in paid work and instead choosing to stay at home with children or as a house-spouse).<sup>6</sup>

Using current work status as a sampling variable for the cases also ensured that this increasingly important life context for older adults was captured in the case sample (in order to understand how older adults use ICTs in work, some older adults who were employed needed to be interviewed). As can be seen in Table 3.2, this study sought to recruit several individuals who fit each combination of both the work and gender criteria.

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<sup>6</sup> As discussed in the proposal defense, this separation of work statuses is somewhat arbitrary (the difference between part and full time work can be as little as one hour of pay) and does not capture the diverse work trajectories of many older adults. For instance, Margaret stayed at home with her children for 20 years before returning to work for almost another 20 years during her divorce. It also fails to capture the differences in type of profession (such as blue, white, or pink collared professions). Therefore, the researcher decided to conceptually split the concept of work into several components: current work status, work trajectory, and occupation type. Since the researcher was interested in understanding how current work status in old age influenced ICT access and support, this was selected as a main sampling criteria. However, when the researcher was selecting cases she was aware and tried to maintain diversity in occupations and work trajectory among the participants, although she did not specifically sample for any of these characteristics.

**Table 3.2 Case Sampling Frame with Collected Cases<sup>7</sup>**

		Gender	
		Male	Female
Working	Full Time	2	2
	Part Time	2	1
Retired		3	5
Stayed at Home (SAH) <sup>8</sup>		XX	2

Due to the intensive nature of this case study, and the nature of the data collection methods, 17 cases were completed, as diagrammed in table 3.2. Because of the sampling frame used, multiple cases could be compared within each cell, also known as a literal replication of each case (Yin, 2009). By seeking three cases of working women, this allowed these three cases to be compared to each other. This sampling frame also allowed theoretical replications and comparisons (Yin, 2009), which allowed these three cases of working women to be compared to retired women, women who have stayed at home, and working men.

<sup>7</sup> It was originally intended that six men and nine women would be recruited for this study. However, one male case was not completed (Cleveland) beyond the first interview. 5 retired women were recruited, two more than originally intended. Late in the study the researcher was given the chance to interview two African American/ Black women who were retired. Since at that time the study participants were all white, the researcher took this opportunity to incorporate some racial diversity. Since both of these women also lived in Public or Section 8 housing, this also added interesting financial diversity to the sample, although more retired women were in the study than originally intended.

<sup>8</sup> As can be seen in the table above, the cell indicated males “that stayed home” has been blocked out. Many women of the Lucky Few generation worked previous to having children or being married but then chose to stay home due to societal expectations of women in this birth-cohort. Women’s participation in the workplace has historically always been lower than men. Currently, 25.2 % of women aged 65-69 years old and 13.8% of women aged 70-74 years old have paid positions of employment. This is compared to 33.5% of men aged 65-69 and 20.8% of men aged 70-74 (Bureau of Labor Statistics, 2011). Excluding this large portion of the female population from the study because of not being able to find men with similar working backgrounds would have resulted in making this a weaker study, and would exclude these women’s voices from being heard. Therefore, this study actively sought out several cases of women who stayed at home and did not return to work, while remaining open to cases of men with similar backgrounds. Not surprisingly no men were encountered in the course of the study had stayed at home.

Each case study involved approximately 8-12 hours of data collection total, with approximately 2-3 hours of contact per interview with primary participants (3 interviews per primary participant and therefore approximately 6-9 hours per case), and ½ to 1 hour of contact with each secondary participant (with 2-3 secondary participants per case, ½ to 1 hour interviews with each individual, and therefore 1 to 3 hours per case). The table below indicates the total number of interviews and hours of audio collected in the course of the study.

**Table 4.3 Number of Participants, Number of Interviews, and Hours of Audio**

	<b>Number of Participants</b>	<b>Number of Interviews</b>	<b>Hours of Audio</b>
<b>Primary Participants</b>	17	49	128
<b>Secondary Participants</b>	32	32	28
<b>Totals</b>	49	81	156

In order to develop these rich case studies, I needed to be selective in my criteria for participation. Several factors had been indicated in previous studies on older adults that may impact the types of ICTs that are being used, including education level, income level, race/ ethnicity, and functional ability. In this next section I have included a discussion of some of these possible variables that were considered for the sampling frame but were excluded. These emergent variables were considered in analysis of the final results of the study to determine if they impacted the findings of the study.

### *Emergent Variables*

Several case sampling variables were originally considered for this study, but were determined to be too complex to use as case sampling criteria, based upon the literature. These included the variables of socio-economic class, education, race/ethnicity, and functional ability, as shown in the table below.

**Table 3.4 Emergent Variables Examined**

<b>Emergent Variables</b>	<b>Previous Literature</b>	<b>Reason for Exclusion from Initial Sampling Frame</b>
Socioeconomic Class	Survey evidence: (income) impacts ownership and adoption	Difficult to easily operationalize; Changes in income after retirement
Education	Survey evidence: impacts ownership and adoption	Changing educational expectations & environments; impact of informal education
Race and Ethnicity	Survey evidence: impacts ownership and adoption	Typically defined using narrow categories, does not capture diversity
Functional Ability	Only Explored in Assistive Studies	Difficult to find cases of working older adults with low functional ability

Income, or socio-economic class, is extremely complicated for older adults. Older adults who have high paying jobs may find their “retirement income” to be significantly less than their pre-retirement income. Other older adults may find that their income has increased as they age, due to benefits that are tied to their disability and/or veteran status. Other older adults who continue to work will see their income stay at a similar level, while their non-working age peers will see their incomes reduced (Hedge, et al., 2006). Therefore, income at an older age is not a good indicator of education level, type of work performed, or social class. Previous research has shown that income does appear to have an effect on computer ownership and adoption (Eastman & Iyer, 2004; Iyer & Eastman, 2006). However, use is a much more complex variable beyond owning a device. Beyond purely examining income, the idea of socio-economic class is a complex variable to

include in any study, as class structure in the United States is defined by a complex mixture of factors, including income, career choice, formal education, self-education, marriage, family history, family financial status, location in which a person lives, and property/ material goods ownership. Even these determinants do not fully capture what is commonly referred to as “class” in the U.S., and so most researchers operationalize class as “income” (Williams, 1998). For example, Ph.D. and medical students are often paid very little during their educational years, but represent a small, highly educated portion of our population. Referring to these individuals in terms of income alone would indicate that they are “lower” or “working” class individuals; however this classification fails to capture the levels of educational opportunity and future earning power these individuals have. It is also difficult to understand the social value of being able to be referred to in the future as “Doctor” or “Professor” in social and work settings, despite these years of low income. Therefore, this study sought to understand “socio-economic class” as a complex mixture of current income, past family income, education, and previous work. The cases were analyzed to see if any emerging themes in ICT use, expectations, meaning, or display could be related to socio-economic class; with significant findings relating socioeconomic class and social support with ICT use.

Education is also a difficult variable to capture, given several factors. First, educational expectations have changed significantly over the past 50 years, particularly for women, minorities, and middle class individuals. As time has progressed in the United States, more individuals have been achieving higher levels of education. Whereas holding a college diploma was a rarity for those born in the first three decades of the 20<sup>th</sup> century, rates of college graduation have significantly and steadily increased since the

1940s (Juhn, Kim, & Vella, 2005). The opportunities available to an individual due to their educational status have changed due to educational expectations as well. For instance, into the 1960s, many diverse educational paths existed for teachers to enter into the primary and secondary teaching environment, which included a range from having completed secondary education to holding a university diploma. Now many states require primary and secondary teachers to hold graduate degrees in teacher education (Labaree, 2008). This reflects the increasing expectations of obtaining post-secondary education for many positions, in addition to reflecting a birth-cohort decrease in the opportunities afforded high school graduates over time.

Second, educational environments have changed dramatically over the past several decades. The types of subjects and the material taught have varied widely over the 20<sup>th</sup> century. Separate curriculums based upon biological sex were once quite common, with women being prepared for the home environment and men prepared for work or college. In addition, the one-room schoolhouses gradually gave way to large centralized school districts as the U.S. population grew (Mondale, 2001). These environmental factors mean that the educational content learned and the context in which it was learned by different birth cohorts (and therefore the meaning of the degree) is quite different. To a certain extent, by examining a subset of a birth cohort, this study controls for changing educational expectations and content. However, examining formal education does not capture informal education by the individual. Some individuals may not hold very high formal educational degrees, but may have informally gained equivalent knowledge through work or self-study. Examining formal education alone does not account for the rich informal education that many individuals have undertaken.

Therefore, education was discarded as a possible theoretical case sampling construct during the conception stage of this study. However, education was captured during data collection (including years of schooling completed, training, and informal education) to determine if these emerged as important factors based upon the themes resulting from the case studies. As can be seen from the case descriptions, there is a huge amount of diversity in the education level of the primary participants in the study. The level of education of individuals in the study did not have a significant impact on ICT domestication.

Race and ethnicity has been suggested to impact older adult's ICT adoption (when narrowly defined as ownership) (Eastman & Iyer, 2004; Iyer & Eastman, 2006; Reisenwitz, et al., 2007). However, to date, no comprehensive studies have examined race or ethnicity and its' effects on use of ICTs (recognizing that use of an ICT is a larger category of behaviors as opposed to adoption). It is important to note that much gerontechnology research is completed in European countries, which tend to have much less racial and ethnic diversity than the U.S. Even though some studies have examined race (typically defined by narrow categories), they have typically done so through demographic survey work which examines ownership and adoption (see for example Eastman and Iyer (2004)). Among the studies in the U.S. that have sought to understand ICT use and adoption through a more qualitative approach, most of these studies have examined predominately white groups and populations (see for example Fitzpatrick (2003) and White & Weatherall (2000)). Therefore, it was difficult to understand preemptively how this construct could impact use. Case analysis in this study examined if

case outcomes differ based upon race and/or ethnicity. Due to the limited racial diversity in this study, however, it was impossible to determine if race had any effect.

A fourth case selection variable that was considered for case sampling was functional ability of the older adult. Although functional ability is an important variable in gerontechnology research, it has mainly been used in studies focusing on assistive technologies (Bouma, et al., 2007), and very few studies have explored its relationship to non-assistive technology use (Blit-Cohen & Litwin, 2005). In this study it was determined that work was a critical variable to capture; and if low and high functional ability levels were added to the case selection criteria, it would make it difficult to find individuals with low functional abilities who were still working. Without much theoretical literature on how functional ability could impact use, meanings, and display of ICTs, it was decided that this variable, operationalized as Instrumental Activities of Daily Living (IADLs), would be collected to be used in later analysis, but not used in the case sampling criteria. IADLs include tasks such as preparing meals, taking medications, housework, and doing laundry. Many individuals live independently with specific help to overcome the challenges presented by being less able to do one of these tasks (for instance, hiring or having a family member come in and do house cleaning or laundry). The Lawton and Brody's IADL Scale (1969) was used to understand individual's ability to complete IADLs (see Appendix C for the instrument used to determine IADLs). One case, Nancy, was a woman who scored lower on the IADL than other cases. As a result of her IADL score, she lived in an assisted living facility.

Through comparisons of the cases based upon their outcomes, I examined if any important differences emerged that may have suggested that socio-economic class,

education, or race/ethnicity, IADLs, or any subset of these concepts impacted usage in older adults' life contexts. These findings are discussed in Chapter 4.

### **Recruitment of Participants**

Each case study ideally involved both a primary participant (older adult) and 2-3 secondary participants (members of similar and dissimilar birth-cohorts). This section describes how each type of participant was recruited.

#### *Primary Participants Recruitment*

Primary participants for each case study were sought based upon personal contacts through a large research university in the Northeastern United States. I asked people I knew throughout the university if they had contact with individuals who met the specified criteria, either as friends, neighbors, relatives, or through community organizations. Several different recruitment strategies were considered for this study, but many different recruitment challenges for older adults that are community-dwelling exist (Birkland & Kaarst-Brown, 2010). Originally, I considered recruiting through community centers around the researcher's immediate area. However, it was determined that this would only recruit community-dwelling individuals who visited such centers, limiting the diversity of the cases.

The referent method was chosen upon reflection of the composition of the university environment and my contacts. This university is the second largest private employer in the county, and employs individuals of many different job types, incomes, and educational levels. By reaching out to many people at the university, this study was able to gather diverse cases that met the sampling criteria in the case sampling frame mentioned previously. In addition, because of the length of time needed for older adults

to participate in the case, it was thought referrals would lead to individuals who are more likely to participate in all three sessions, compared to individuals who are recruited via a poster in a community center and may not be as personally committed.

It was important that individuals who participated in the research study were compensated for their time and participation in the study. Participants were also compensated for the time they participated in the study, even if they later withdraw from the study (Marshall & Rossman, 1989). Primary participants received a \$20 gift card to a grocery store, department store, pharmacy, or restaurant of their choice for each of the three interviews they participated in. Secondary participants received a \$10 gift card to a grocery store, department store, pharmacy, or restaurant of their choice for their participation in an interview.

Cases were screened to ensure that relevant cases are selected, based upon the literal and theoretical replication goals of the case study (Yin, 2009), mentioned in the previous section.

#### *Secondary Participants Recruitment*

For each primary participant, secondary participants were also sought. Secondary participants were recruited using primary participant's referrals, using a referral snowballing strategy (Goodman, 1961). Older adults, the primary participants in each case, were asked to identify 3-4 individuals who they consider themselves close to (in any of their life contexts) with whom they use ICTs in their relationships. Older adults were asked to identify individuals in a similar birth cohort (the Lucky Few, born from 1929 through 1946) as well as individuals in a younger or older birth cohort. By selecting individuals of different and similar birth cohorts; this allowed comparison of expectations

and influences on introduction and usage by birth cohort of the secondary participant. While there was some diversity in the birth cohorts of the secondary participants, for some primary participants such diversity was not possible due to the nature of their social network.

The older adult was asked to provide these individuals' contact information, and also was asked to contact the secondary participants to let them know that I would be contacting them to see if they wished to participate. By being able to make a "warm" call, I hoped to be able to encourage and increase participation. Secondary participants were not able to be recruited for every case due to the size of the primary participant's network and the network individual's willingness to participate in the study.

An illustration of the sampling frame for secondary participants is indicated in the Table 3.5.

**Table 3.5 Sampling Frame for Secondary Participants**

<b>Type of Participant</b>	<b>Birth Cohort (Carlson, 2009)</b>	<b>Relationship</b>	<b>ICTs Used in Relationship w/ Older Adult</b>
<b>Primary Participant</b>	Younger half of the Lucky Few (specifically born 1936-1946)		
<b>Secondary Participant 1</b>	Lucky Few (born 1929-1947)	Any	Yes
<b>Secondary Participant 2</b>	Great Warrior (born 1909-1928) Baby Boomer (born 1947-1964), Generation X (born 1965-1982), Generation Y (born 1983-2011)	Any	Yes
<b>Secondary Participant 3</b>	Great Warrior (born 1909-1928) Baby Boomer (born 1947-1964), Generation X (born 1965-1982), Generation Y (born 1983-2011)	Any	Yes

It was decided that the relationship of the secondary participant would not be defined. Individuals may hold more than one relationship with an older adult (such as co-worker and friend or friend and family member) making the specification of only one relationship problematic. For many of the older adults, the individuals that they identified were friends and family. However, there is great diversity in the network size of older adults (Lubben, 1988) and some did not have friends or family members who they were close to. Most primary participants identified people who they actually held multiple relationships with, as can be seen in Chapter 4.

### **Overview of Data Collection Methods**

Two major methods of data collection were used in this study: semi-structured interviews and the use of documents. Appendix B provides a table summary of each of these methods: the goals, data obtained, and pros and cons of each of the methods chosen.

#### *Semi-Structured Interviews: Primary and Secondary Participants*

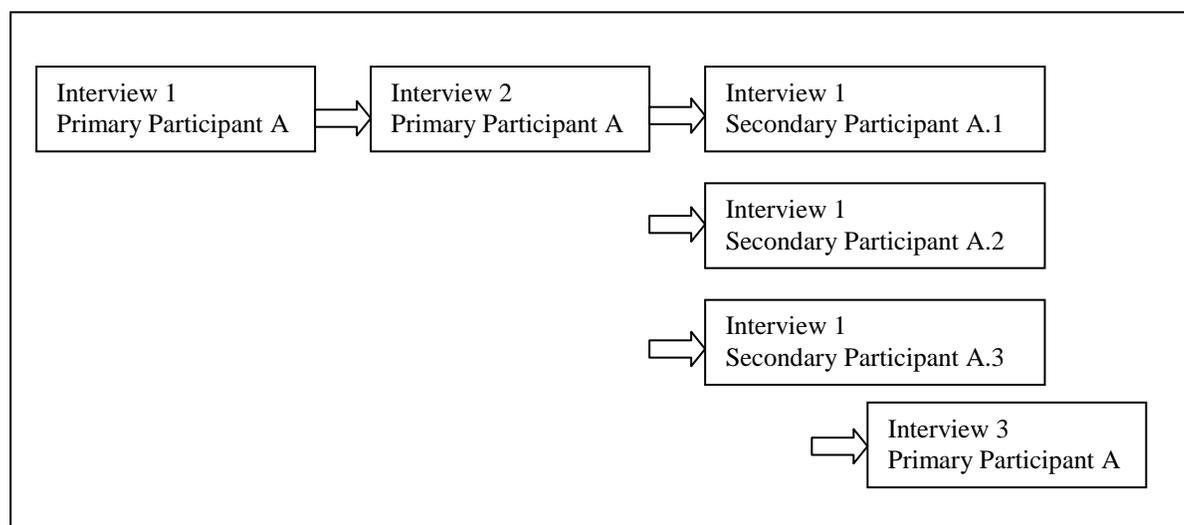
Semi-structured interviews were used to understand the life contexts, ICT usage, ICT display, and meanings of ICTs to older adult's lives, as well as older adult's assessments of their life satisfaction. Semi-structured interviews were also used to understand differing expectations of ICT use through interviews with the secondary participants.

Maso and Wester (1996) define an interview as a verbal interaction during which the researcher (the interviewer) attempts to obtain information from a participant (the interviewee) based upon the researcher's goals. Interviews differ based upon their degree of structure: from highly structured interviews where the questions are all pre-defined to highly unstructured interviews where no questions are predefined. Semi-structured

interviews are towards the middle of this continuum, using non-directive questions and a topic list that contains information that is important to the researcher (Maso & Wester, 1996).

For this study, semi-structured interviews were chosen for a number of reasons. First, such a format allowed me to cover many topics of interest in theory and practice (Maso & Wester, 1996). By not limiting the questions or the answer formats, semi-structured interviews are appropriate for obtaining the meanings of objects and events, which cannot be predetermined. As a result, the dialogic method of interviewing can be used to discover meaning and the researcher can translate that meaning (Denzin, 2001). Such semi-structured interviews require that the researcher work from previous research rather than being purely open-ended and grounded (Pawson, 1996). Third, the philosophy of semi-structured interviews fits with the interpretative interactionism approach of this study. Semi-structured interviews allow the interviewee more freedom to share their answers and make their voices heard. In some cases, the interviewee and the interviewer shape the research study through helping the researcher to reformulate the research topic (Maso & Wester, 1996). Finally, this method was chosen because it allowed me to balance the advantages of having a more structured interview with a less structured interview, through allowing the interviewee to interpret and explain topics in terms of their own context, shedding light on important variables of interest which I did not previously consider (Maso & Wester, 1996). All of these proved to be extremely critical to the success of this study. In particular, being able to tailor questions to the participant's level of understanding (including their verbiage regarding ICTs) and the flexibility to explore emergent meaning was critical.

Each primary participant was interviewed three times over the course of the study. Two of these three interviews occurred before the interviews with the secondary participants (if secondary participants could be recruited), and the final interview occurring after, as can be seen in Figure 3.1. A series of interviews was chosen as Wengraf (2001) recommends multiple interviews to improve recall and also to explore multiple topics if the scope of the project is large. The large scope of this project required several hours of questioning of the older adult primary participants, which could have resulted in fatigue for some of the participants (Reich, 1978). By breaking the interviews into three separate sessions, this reduced concerns over fatigue. Multiple interviews also made it more likely that the participant and I were able to relate to one another and speak about potentially sensitive topics. Bogdan and Biklen (2003) suggest that the researcher and participant may have difficulties connecting to one another due to differences in age, race or ethnicity, class, educational level, or skills levels. Since I am several birth-cohorts younger than the primary participants, I was often perceived as having greater ICT skills and being a “fan” of ICTs with an agenda to prove that ICTs were good for older adults to use. These feelings could have resulted in participants not feeling as open with me as possible. Through the multiple meetings, however, these feelings of disconnection were reduced. The three interview format resulted in participants feeling more open with me and reassured many of the participants that I did not have a “pro-technology agenda” and was “actually interested in what they thought” (Margaret). For many of the participants, their most painful yet relevant and important experiences were not revealed fully until the last interview once the rapport had been developed. This was particularly true for Margaret and Natalie, who had highly personal stories about ICTs to share.



**Figure 3.1 Structure of the Case Studies: Interview Order**

Wengraf (2001) suggests that each participant in a study be interviewed three times, as this allows the researcher not only to gather more detailed data and improve recall, but also for the researcher to conduct analysis between the interviews. Since this is a study that focused on meaning, I needed to check with the primary participants to see if my interpretations of these meanings were correct, and this required that I analyze the data between the interviews (Denzin, 2001). The use of multiple interviews allowed for such checks on meaning to occur, as specified by the dialogic method. By scheduling the final interview following the secondary participants' interviews, this allowed exploration of any topics, new ICTs, or stories that may have emerged through these interviews. This structure also provided an opportunity to explore the older adult's expectations for their own ICT use and their perspectives on other's expectations, and provided closure for each case study.

Wengraf (2001) suggests that a researcher should also conduct interviews with individuals close to the primary participant of any study, in order to triangulate the

phenomenon or information of interest. The use of the semi-structured interviews with each secondary participant sought not only to triangulate ICT usage by the older adult, but also to gather information about expectations, how the older adult was exposed to ICTs through relationships, and conflict, compromise, and negotiation regarding usage.

During these interviews, the use of index cards was employed in order to record and visualize the ICTs used, not used (but considered or abandoned), and the life contexts in which each of these ICTs are used. These index cards were primarily used as prompts, enabling the older adult and myself to visual how ICT usage is different across different contexts. I took digital photographs of the arrangement of the index cards to facilitate in the analysis of the data.

### *Interview Guides*

Semi-structured interviews tend to require more preparation before the interview than other forms of interviewing. This preparation included creating, drafting, and testing the interview guides to be used (Wengraf, 2001). This section includes the basic structure of each of the four different interview guides that were used in each case.

#### *Primary Participant: Interview 1*

The first interview had several goals: to establish rapport with the primary participant, begin learning the idiolect of the participant regarding ICTs, and to begin collecting information about the older adults' roles, life contexts, and ICT use. Foddy (1993) suggests a strategy for using multiple interviews, by introducing topics in initial interviews and exploring them in later interviews, hence one of the larger focuses in the first interview was exploring the ICTs that older adults use in general.

Each interview began with a short, fact-based introduction of myself. Blum (1970) recommends that such an introduction be based upon facts about the individual and not provide opinions about topics, as this can contaminate the interview or even lead the participant to be hesitant in participating if their opinion differs. Following this introduction, the participant was asked to describe a typical day and week. This allowed the participant to relax and for the researcher to become familiar with their life context. The following question asked the participant about their definition of an ICT. The reasoning behind this question was two-fold. First, this question helped me to understand the participant's idiolect regarding ICTs. Denzin (2001) suggests that the process of learning the language of a participant is critical to understanding the meaning that individuals give to objects and experiences, but also to understanding how this meaning and language structures their everyday lives. It is important to use the participant's own language in the interviewing process, rather than theoretical or technical terms, as such "proper terms" can contaminate the interview and bias the participant's response (Wengraf, 2001). As Yin (2009) clarifies, theoretical or technical questions should not be asked to participants; instead such questions should use the terminology of the participant. Second, this question sought to open a discussion in which I could clarify the types of ICTs that this study was interested in, setting the boundaries of the study.

The following questions in the interview guide sought to generate stories about ICT usage. Interpretative interactionism seeks to understand a person's history and biography and the meaning they give to events and objects through stories. Specifically, the method seeks out context rich stories that are embedded in the persons own historical, biographical, and cultural life. Stories represent an examinable unit of an individual's life

which comes from these events that conveys meaning to the participant. Stories are also highly important, as they are not recorded in documents, and therefore interviews are the only way to access this information. As an example, Denzin (2001) provides the story of a woman he interviewed, who served on a school board and was the deciding vote to desegregate her school. Despite her important involvement in this event (and the way it shaped the rest of her life) her time served on the school board was not even mentioned in her obituary.

Each interview guide sought to understand and obtain multiple stories from each individual, to enable a more accurate interpretation of that individuals' experiences, as well as to triangulate (Denzin, 2001) the use, meanings, and display of ICTs. Many of these stories developed and unfolded across the three interviews. Four types of follow up questions were asked as needed throughout the interviews that are not reflected in the interview guides. These included chronological (which asked about event order), detail (which asked for more information), clarification (which sought to check understanding of the researcher), and explanation questions (which asked for participant reasoning) (Schatzman & Strauss, 1973).

Probing used a dialogic method, in which I searched for meaning in an individual's stories and then interpreted that meaning (Denzin, 2001).

Index cards were also used throughout the first two interviews. During the first interview, a list of the ICTs used were recorded on a set of index cards (one ICT per card). This helped in further probing about each ICT, but also served as visualization for the older adult. ICTs which were tried, but abandoned, were recorded on a second color

of index cards. ICTs which the older adult wishes to try were recorded on a third color of index cards.

**Table 3.3 Interview Guide: Primary Participant First Interview**

<b>Interview Question</b>	<b>Purpose</b>	<b>Data Collected</b>
Introduction of study; informed consent; introduction of myself.	To establish informed consent for the experiment and ensure that the participant has a chance to withdraw if they wish to. Through introducing myself, this may make the interviewee more comfortable.	No Specific Data: Signed Informed Consent
Can you tell me a bit about yourself?	Understand personal biography, personal history. Make the individual more comfortable.	Personal biography; Basic Demographic Information: Educational History, Work History, Family History, Income; Community Involvement; Potential Secondary Participants
Describe a typical day for you. Could you describe any important tasks or activities that you do during a typical week?	Warm up the participant by having them talk about their daily lives. Obtain a baseline understanding of some of the tasks, relationships, and life contexts of the participant.	List of Life Contexts, including: Work, Volunteer, Family, Community, Other Contexts; Personal Biography/ History
When someone uses the words “information and communication technologies”- what do you think of? How would you define “information and communication technologies”? Can you give a few examples?	Determine what older adults define as ICT. Achieve shared understanding between the participant and myself as to what “ICTs” are as far as this study. Begin to understand older adult’s ICT idiolect.	Definition of ICTs; What is considered an ICT and what is not; List of ICTs; Examples of ICTs and Non-ICTs
Can you tell me about some of the ICTs you use?  Prompt for other ICTs.	Determine a List of ICTs Used. Create a series of cards for each individual.	List of ICTs used (Possibly the contexts used in); List of ICTs not used.

<b>Interview Question</b>	<b>Purpose</b>	<b>Data Collected</b>
<p>Can you tell me when you first started using each of these ICTs?</p> <p>Why did you start using each of these?</p> <p>Do you now use any of these ICTs differently than when you first started using them?</p>	<p>Determine first introduction of ICTs. ICTs can be introduced to a person because of their activities and tasks, but also because of their relationships.</p> <p>Meanings of existing ICTs change when new ICTs are introduced, new ICTs do not necessarily replace old ICTs, but they can change their use and meaning.</p>	<p>Who introduced them; First exposure experiences, context of introduction; meaning of use; tasks used for; Stories about the first usage; Challenges and Opportunities of ICT usage; Changes in Use over time; Relationships and Tasks that influenced the introduction of ICTs</p>
<p>Have you used any other forms of ICTs over the years?</p> <p>Why did you stop using these ICTs?</p> <p>Are there any ICTs you tried once, but decided not to use again?</p>	<p>Determine additional ICTs that have been tried and abandoned. Very little is known about older adults who have adopted ICTs but later stopped using them.</p>	<p>List of ICTs tried and abandoned, Change in Meaning of ICTs over time; Challenges in ICT use or in learning ICTs; Resources needed for success; Resources no longer available</p>
<p>How do you use each of these ICTs (on the cards)? What do you use them for?</p>	<p>Determine the advantages of use; reasons why these individuals use these ICTs.</p> <p>Allow comparison across different life contexts.</p>	<p>Reasons for ICT use; Associated Uses with each ICT; Uses for Tasks and/or Relationships; Use of ICTs in different life contexts.</p>
<p>What are some of the advantages of using each of these ICTs on the cards?</p>	<p>Determine the advantages of use. ICTs are not neutral objects; their use can result in consequences. This will determine any positive consequences of use.</p>	<p>Advantages of being a user of each ICT; meaning of being a user; Stories about successful use; Opportunities because of use.</p>
<p>What are some of the disadvantages of using each of these ICTs?</p>	<p>Determine the disadvantages of use. ICTs are not neutral; they can have negative ramifications as well as positive ones.</p>	<p>Disadvantages of being a user of each ICT; meaning of being a user; stories about unsuccessful and/or unintended consequences (such as privacy concerns).</p>
<p>Are there any ICTs you would like to start using but you haven't used them yet?</p>	<p>Determine ICTs that the older adult may want to try, but they have not yet tried.</p>	<p>List of ICTs considered; Challenges and Barriers; Resources that would be Helpful to Older Adults</p>
<p>Has not using an ICT ever caused problems or issues for you?</p>	<p>Some contexts may require ICT usage, such as voting. It is unclear how the introduction of ICTs into these contexts has impacted older adults. It is important to determine if older adults are excluded from participation in some contexts.</p>	<p>Disadvantages of non-use; Perceived challenges in Use</p>
<p>Wrap up Interview; Schedule Next Interview</p>	<p>Close interview and schedule next interview.</p>	<p>New Contact Information, Date and Time</p>

*Primary Participant: Interview 2*

While the first interview focused on understanding the ICTs that older adults used, tried, or wished to try; the second interview sought to understand how these ICTs were used in the various life contexts of family, leisure, community, and work (if applicable). A second goal of this interview was to explore the display and the meaning of the display to the older adults. Placing the display portion of the study in the second interview turned out to be a critical decision, as by the end of the second interview the participant was comfortable enough to take the researcher on a tour of their home. The index cards that were created in the previous interview were used in this interview to explore if and how these ICTs were used in different life contexts. Additional index cards often needed to be added, as additional ICTs were often discovered through the interview. Index cards were arranged around each life context, and a digital photograph of this arrangement for each life context was taken to aid in analysis. Photographs were also taken of displays of the older adult's ICTs in their home, as well as any support documents, such as "cheat sheets" that were used to facilitate use of the ICT(s).<sup>9</sup> These were also used to help in the analysis of the meaning of the ICTs' display. Finally, this interview also addressed any issues that arose during analysis of the first interview.

**Table 3.4 Interview Guide: Primary Participant Second Interview**

<b>Interview Question</b>	<b>Purpose</b>	<b>Data Collected</b>
Is there anything that you thought of since the last interview you want to mention?	Capture further information from the participant, which may have been considered between the last interview and this one.	Further Stories, Lists of ICTs used, relationships, roles, stories about ICT usage, Advantages and Disadvantages, conflict over usage; Potential Secondary Participants

<sup>9</sup> These pictures did not include the older adult. Any pictures shown to others had any identifying information (such as a name) blocked out digitally, with the file saved so such editing cannot be reversed.

<b>Interview Question</b>	<b>Purpose</b>	<b>Data Collected</b>
<p>We made these cards representing the different ICTs that you currently use in your life. (Review ICTs on cards). I would like to ask you if, and how, you use these ICTs in your everyday life.</p> <p>Let's start with your family. Which of these ICTs do you use in your home life or in interactions with family?</p> <p>Can you tell me how you use each of these ICTs in your family life?</p> <p>Why do you use these ICTs, and not something else? Are there any ICTs you have tried in your family life, but have stopped using? Why? Are there any ICTs you would like to try?</p>	<p>The family context has been the most studied in domestication. The family is thought to highly influence the usage, routines, and meanings of ICTs.</p>	<p>List of ICTs Used in Family Life; What ICTs are Used For; Connection of ICTs to Family Context; Benefits of ICTs Used/ Not-Used in Family; Disadvantages of ICTs Used/Not-Used; Consequences of Non-Use; Stories of ICT use; Routines and Structures of Use; Meaning of ICTs in Context; Differences in Use across different family generations; Conflict regarding ICT use/ non-use; Exposure to ICTs; Resources needed to be successful; Relationships that influence use; Tasks that Influence Use (Possible Secondary Participants)</p>
<p>Which of these ICTs do you use in your leisure life? (Such as with friends or for hobbies?)</p> <p>Can you tell me how you use each of these ICTs in your leisure life?</p> <p>Why do you use these ICTs, and not something else? Are there any ICTs you have tried in your leisure life, but have stopped using? Why? Are there any ICTs you would like to try?</p>	<p>ICTs use in leisure has mainly examined gaming of young adults (college students) or young children (under the age of 18). However, ICTs can be used in many ways either as hobbies themselves, or to facilitate an individual's hobbies or friendships. ICT usage and its meanings are likely different in the leisure context than in other contexts.</p>	<p>List of ICTs Used; What ICTs are Used For; Connection of ICTs to Leisure Context; Benefits of ICTs Used/ Not-Used in Leisure; Disadvantages of ICTs Used/Not-Used; Consequences of Non-Use; Stories of ICT use; Routines and Structures of Use; Meaning of ICTs in Context; Differences in Use across different generations; Conflict regarding ICT use/ non-use; Exposure to ICTs; Resources needed to be successful; Relationships that influence use; Tasks that Influence Use (Possible Secondary Participants)</p>

<b>Interview Question</b>	<b>Purpose</b>	<b>Data Collected</b>
<p>Which of these ICTs do you use in your community life? (Such as in volunteering, participating in citizen activities, or in other organizations, such as religious organizations?)</p> <p>Can you tell me how you use each of these ICTs in your community life?</p> <p>Why do you use these ICTs, and not something else?</p> <p>Are there any ICTs you have tried in your community life, but have stopped using? Why?</p> <p>Are there any ICTs you would like to try?</p>	<p>ICT usage in the community life of older adults has not been fully explored, but is considered very important by gerontechnologists. It is likely that environments such as volunteering result in exposure to ICTs.</p>	<p>List of ICTs Used; What ICTs are Used For; Connection of ICTs to Community Context; Benefits of ICTs Used/ Not-Used in Community Context; Disadvantages of ICTs Used/Not-Used; Consequences of Non-Use; Stories of ICT use; Routines and Structures of Use; Meaning of ICTs in Context; Differences in Use across different generations; Conflict regarding ICT use/ non-use; Exposure to ICTs; Resources needed to be successful; Relationships that influence use; Tasks that Influence Use</p> <p>(Possible Secondary Participants)</p>
<p>Which of these ICTs do you use in your work life?</p> <p>Can you tell me how you use each of these ICTs in your work?</p> <p>Why do you use these ICTs, and not something else?</p> <p>Are there any ICTs you have tried in your work, but have stopped using? Why?</p> <p>Are there any ICTs you would like to try?</p>	<p>Determine ICTs used in work, how they are used, and why they are used. Work is an important aspect of everyday life in which ICT use occurs, influencing use in other life contexts.</p>	<p>List of ICTs Used; What ICTs are Used For; Connection of ICTs to Work Context; Benefits of ICTs Used/ Not-Used in Work; Disadvantages of ICTs Used/Not-Used; Consequences of Non-Use; Stories of ICT use; Routines and Structures of Use; Meaning of ICTs in Context; Differences in Use across different generations; Conflict regarding ICT use/ non-use; Exposure to ICTs; Resources needed to be successful; Relationships that influence use; Tasks that Influence Use</p> <p>(Possible Secondary Participants)</p>
<p>Who has been the most influential to your ICT use?</p>	<p>Determine people who have influenced the older adult's ICT usage. The introduction of ICTs is considered very important to the domestication process, and ICTs become introduced to individuals in many different ways.</p>	<p>Meaning of ICTs in Relationships; Differences in Use across different generations; Differences in Use across different birth cohorts; Differences in Use across different relationships; Differences in Use in family, friend, and community/volunteer relationships; Exposure to ICTs</p>
<p>Can we take a look at some of the ICTs you mentioned in our discussion? Can you describe to me where these ICTs are?</p>	<p>Observe Display and determine the meaning of display to participant. Display is an important part of the domestication of technology, and can indicate that ICT's place, use, and meaning to the individuals in a home.</p>	<p>Location, Meaning of Display, Conflict/ Compromise/ Ideal location, Advantages and Disadvantages of Location, Changes Wanted, How display structures use; how use structures display, how display impacts daily life. Importance of the display to older adult.</p>

<b>Interview Question</b>	<b>Purpose</b>	<b>Data Collected</b>
Why are they in this location?  How does being in this location impact how you use them?	Understanding Display of Objects. How display comes to have meaning to the older adult. How display impacts use.	History of location/ display; Changes in Location; Location in Home/ outside world; Meaning of Display, Conflict/ Compromise/ Ideal location; Advantages and Disadvantages; Changes Wanted; How display structures use; how use structures display; how display impacts daily life; Importance of the display to older adult; Meanings of Display
Do you use any documents to help you in using this ICT? Can you show these to me? Can you tell me how you use these?	View documents; understand the meaning of use of documents.	Images of documents, meaning of documents, Advantages and Disadvantages of use, resources surrounding ICT use, importance of documents to older adults
Other questions that emerge from preliminary analysis, including clarification, explanation, etc.	Clarify points that are unclear Check my understanding of meaning	Clarify Meanings Check Chronological Order Ask for more detail Seek out Explanation and Reasoning
Seek Referrals and Contact Information for Secondary Participants: One similar birth cohort and two dissimilar birth cohort Ask Participants to Contact them	Obtain secondary participants. Ensure a “warm call”	Names of Individuals Contact information Relationship with Participant Life Context(s) shared with Participant Birth Cohort Information Possible information about the relationship

### *Secondary Participants: Interview 1*

The goals of the interviews with the secondary participants was to understand how these relationships had impacted ICT use and exposure of the primary participant, the secondary participant’s expectations for older adult’s ICT use, and conflict, compromise, and negotiation in the use of ICTs in the relationship between the secondary and primary participant.

**Table 3.5 Interview Guide: Secondary Participant Interview**

<b>Interview Question</b>	<b>Purpose</b>	<b>Data Collected</b>
Can you tell me about yourself?	Determine personal biography and history.	Personal history, biography, age (birth cohort)
What is your relationship with person X?	Determine relationship with the older adult.	Closeness to older adult, how often they interact, life contexts.

Interview Question	Purpose	Data Collected
<p>When someone uses the term “Information and Communication Technologies”- what do you think of? How would you define “Information and Communication Technologies”?</p> <p>What are some examples of ICTs?</p>	<p>Achieve shared understanding between the participant and myself as to what “ICTs” are as far as this study.</p> <p>Determine exposure to ICTs.</p> <p>Begin to understand secondary participant’s ICT idiolect.</p>	<p>Definition of ICTs; What is considered a ICT and what is not;</p> <p>List of ICT examples; List of non-ICTs</p>
<p>Can you tell me about some of the ICTs that you have used in your relationship with X?</p>	<p>Understand ICT exposure of the older adult through this relationship.</p> <p>ICTs used.</p>	<p>List of ICTs used; Lists of ICTs considered</p>
<p>How do you use each of these ICTs in your relationship with person X?</p> <p>Who suggested using this ICT in the relationship?</p>	<p>Understand how the relationship impacts use and exposure of ICTs. Family and friend relationships have been indicated to influence ICT usage.</p>	<p>Comparisons to others, across birth cohorts, within birth cohorts</p> <p>Expectations, Challenges, Advantages, Disadvantages, Stories of use, Meaning of use</p> <p>Relationship’s impact on usage/non-usage</p>
<p>Are there any ICTs that you tried using in your relationship with person X, but you no longer use?</p> <p>Why did you stop using these ICTs?</p> <p>Are there any ICTs you would like to try? Why?</p>	<p>Determine what ICTs have been tried, but were considered to be unsuccessful.</p>	<p>Lists of ICTs introduced but abandoned; Reasons abandoned;</p> <p>Challenges/ benefits/ disadvantages of use and/or non-use; Conflict regarding ICT use; Resources needed; Resources Lacking; ICTs considered, but not used; Impressions of older adult’s ICT use</p>
<p>How would you describe X’s ICT use?</p> <p>How would you compare X’s ICT use compared to others of the same age?</p> <p>What are your expectations for ICT use by people who are a similar age to X?</p> <p>Is there anything you wish was different about person X’s ICT use?</p>	<p>Understand expectations for ICT usage based upon age and relationship with the individual.</p> <p>It is possible that differences exist between birth-cohorts as far as expectations regarding ICT usage.</p>	<p>Comparisons to others; age-related expectations; surprises; stereotypes; birth-cohort differences in expectations; stories about use/non-use; Conflict over ICT Use/Non-Use; Challenges/ benefits/ disadvantages of use and/or non-use</p>

### *Primary Participant: Interview 3*

The goals of the third interview with the primary participant were to understand their own expectations for their own usage, their expectations of others in the same and

other birth-cohorts, and how differences in expectations impacted them. The final interview also sought to understand life satisfaction of older adults and obtain demographic information that has not been collected in other parts of the interview process. The interview also addressed any issues or meanings that emerged from the analysis of the second and first interviews with the primary participant, and also addressed any issues that emerged from the interviews with the secondary participants, such as additional ICTs.

The IADL was administered verbally by asking the participant how they handle the eight domains of function (see Appendix C). I used further probing if necessary in order to identify which statement on the IADL for each functional domain best matched the participant. In the analysis following this final interview, the score of each primary participant from the IADL was calculated.

**Table 3.6 Interview Guide: Primary Participant Third Interview**

<b>Interview Question</b>	<b>Purpose</b>	<b>Data Collected</b>
Is there anything that you thought of since the last interview you want to mention?	Capture further information from the participant, which may have been considered between the last interview and this one.	Further Stories; Lists of ICTs used; relationship impacts; task impacts; stories about ICT usage/ non-usage; Advantages and Disadvantages; conflict over usage/ non-usage
If someone asked you to describe your ICT use, how would you describe it?  How do you feel about ICTs in general?	By placing this question in the final interview, this hopes to avoid contamination of previous interviews by suggesting I am “judging” the older adult’s ICT usage.	Differences in Expectations; Comparisons of the Older Adult to others; Comparisons of the older adult to similar birth cohorts; Comparisons of the older adult to different birth-cohorts/ family generations; Comparisons of usage/non-usage across the older adult’s life contexts

<b>Interview Question</b>	<b>Purpose</b>	<b>Data Collected</b>
<p>How would you describe X.1's ICT use?</p> <p>How would you compare X.1's ICT use to yours?</p> <p>How have these differences or similarities impacted you?</p> <p>What expectations do you feel they have for your use?</p>	<p>Understand the older adult's perspective on the other individuals ICT usage, and what their expectations are for their usage. How these differences in use may have impacted the older adult.</p>	<p>Description of the network member's ICT usage; Lists of ICTs Used; Comparison of ICTs Used; Comparisons of Attitudes towards ICTs</p> <p>Effects of Relationship on ICT usage; Exposure to ICTs; Advantages and Disadvantages of Use/Non-Use; Conflict, Compromise, and Negotiation</p>
<p>How would you describe X.2's ICT use?</p> <p>How would you compare X.2's ICT use to yours?</p> <p>How have these differences or similarities impacted you?</p> <p>What expectations do you feel they have for your use?</p>	<p>Understand the older adult's perspective on the other individuals ICT usage, and what their expectations are for their usage. How these differences in use may have impacted the older adult.</p>	<p>Description of the network member's ICT usage; Lists of ICTs Used; Comparison of ICTs Used; Comparisons of Attitudes towards ICTs</p> <p>Effects of Relationship on ICT usage; Exposure to ICTs; Advantages and Disadvantages of Use/Non-Use; Conflict, Compromise, and Negotiation</p>
<p>How would you describe X.3's ICT use?</p> <p>How would you compare X.3's ICT use to yours?</p> <p>How have these differences or similarities impacted you?</p> <p>What expectations do you feel they have for your use?</p>	<p>Understand the older adult's perspective on the other individuals ICT usage, and what their expectations are for their usage. How these differences in use may have impacted the older adult.</p>	<p>Description of the network member's ICT usage; Lists of ICTs Used; Comparison of ICTs Used; Comparisons of Attitudes towards ICTs</p> <p>Effects of Relationship on ICT usage; Exposure to ICTs; Advantages and Disadvantages of Use/Non-Use; Conflict, Compromise, and Negotiation</p>
<p>Other questions that emerge from preliminary analysis, including clarification, explanation, etc.</p>	<p>Clarify points that are unclear</p> <p>Check my understanding of meaning</p>	<p>Clarify Meanings</p> <p>Check Chronological Order</p> <p>Ask for more detail</p> <p>Seek out Explanation and Reasoning</p>
<p>Administer IADL instrument.</p>	<p>Determine if the older adult has any IADL limitations.</p>	<p>Completed IADL form (Eventual IADL score)</p>
<p>Close out interview and thank participant; debrief.</p>	<p>Provide closure to the research study with the participant.</p>	<p>No specific data.</p>

### *Fieldnotes, Memoing, and Reflections*

During each interview, careful notes were taken about the setting and participants to enable contextualization (Denzin, 2001). These notes included descriptions of the display of ICTs and participants' non-verbal gestures and behavior. Following each

interview, I recorded detailed field notes which included: portraits of the individual, reconstructions of bits of important dialog, a description of the physical setting, and the observed behavior. Each field note associated with an interview had a detailed section indicating my thoughts on emerging themes, methodological issues which arose during the interview, and my own frame of mind (and potential bias) during the interview (as recommended by Bogdan and Biklen (2003) and Bogdan and Taylor (1975)). This memoing was critical to the analysis of the data. If not for the intensive memoing, the theory of user types would not have emerged.

Originally the researcher had planned on transcribing all of the transcripts herself, but this was found to be too time consuming and interfered with the data collection and analysis. Instead, the researcher transcribed roughly one third of the interviews herself, hiring a professional transcriptionist for the remainder.

#### *Pre-testing of Interview Guides*

The interview guides were originally tested using my personal family, friends, and Ph.D. student colleagues in order to determine interviewee understanding, the types of data that could be obtained, and the potential length of the interviews. Each interview guide was tested with two to three individuals. In the field it was found that only two questions needed to be modified, both in the secondary participant interview guide. First, the question “What are some non-examples of ICTs?” was removed as it proved to be too confusing to the participants. Several attempts were made to revise this question, however, confusion remained and quality data regarding non-examples of ICTs was elusive. Second, the question “Is there anything you wish you could change about the primary participant’s ICT use?” was changed to “Is there anything you wish was different

about the primary participant's ICT use?" This change resulted in better data as it focused less on what the secondary participant could do to change the primary participant and more on universal things that could be different in the primary participant's use.

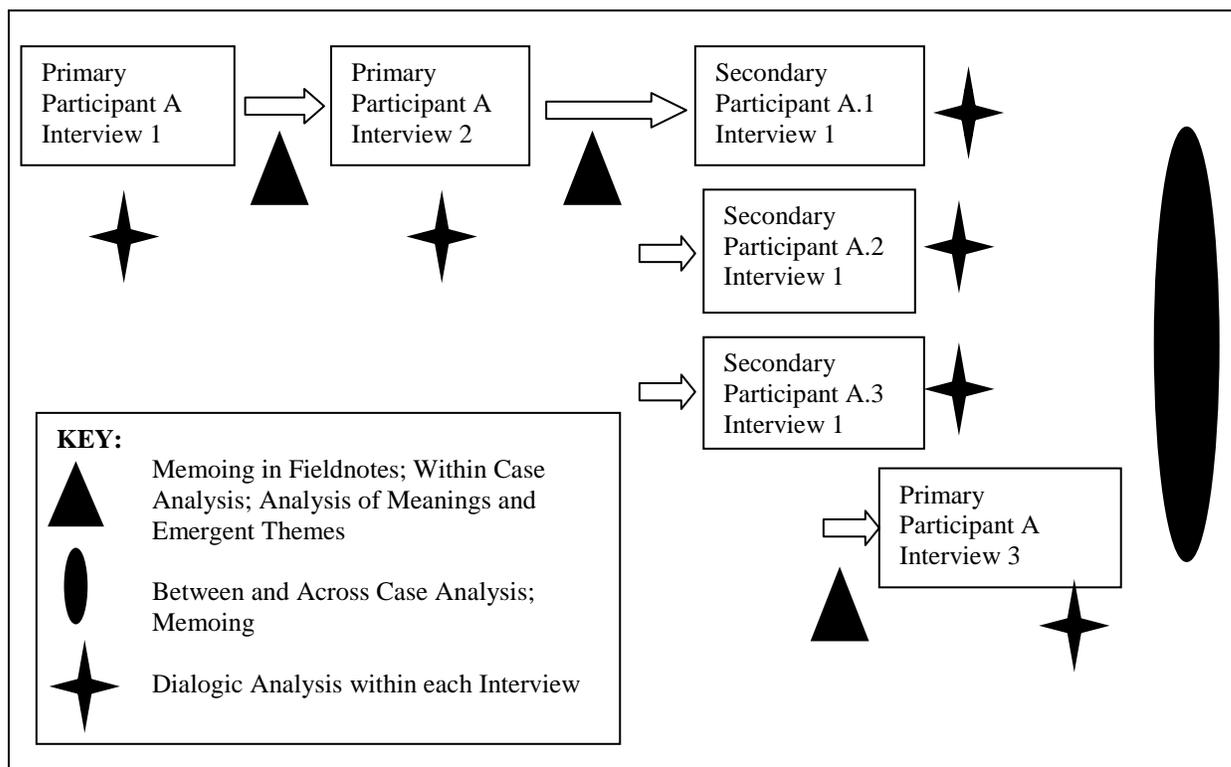
### **Data Analysis**

This study was an embedded series of comparative case studies where many different units of analysis were used. ICT usage, the display of ICTs, and their underlying meaning, and the life satisfaction of older adults were examined across life contexts and relationships. Expectations for usage were compared between individuals (two people who share a relationship) and also across contexts in order to understand differences. Cases were also compared based upon the theoretical constructs of work and gender to determine differences between use/non-use of ICTs, ICT meaning, ICT display, and life satisfaction. Each interview transcript underwent preliminary analysis immediately after being transcribed and before the following interview.

Several different strategies of analysis were used. Dialogic analysis was used to interpret the meaning of ICTs, their display, and their impact on life satisfaction within the interview itself. Dialogic analysis uses a reiterative process of interpreting the meaning in a segment of text/ the interview, relaying that meaning to the participant, and revising that meaning (Denzin, 2001). Emergent analysis of themes was also used in order to determine themes in the types of ICTs used and the routines of use across contexts and participants. Initial concepts were given codes, and these codes were then grouped into themes which had explanatory power (Bogdan & Biklen, 2003). Finally, various case study analysis strategies were used to compare the cases theoretically and literally (Yin, 2009).

Analysis was ongoing throughout the data collection phase. The figure below indicates the types of analysis that occurred throughout the study. During each case study, extensive memoing took place between each interview, with a particular focus on understanding meaning, emerging themes about ICT use, and within case analysis. Memoing was the most important strategy in generating the significant findings for this study. Originally the study began with three female participants: Natalie, Margaret, and Jackie. In memoing, it was originally thought that these three women's similarities in perspective, experience, and meaning were due to a gender effect. However, when Alice's case was added to the study, it was realized that the similarities between the first three women were not due to gender but some other factor. Through extensive memoing the user typology (described in Chapter 4) was developed. Although coding was critical to deeply examining the user types and clarifying their differences as they emerged, without memoing these types would have never been recognized. Since memoing occurred throughout the study, this allowed the researcher to "test" her emerging theory on new participants but also to check the validity of her theory on past participants.

At the end of each case study, analysis included understanding emerging themes and meaning, but also compared literal and theoretical cases (between case analysis) and understanding emergent variables which appeared to impact use (across case analysis). Comparing cases (literal and theoretically) and examining meaning, use, and emerging themes were also examined at the end of the data collection phase.



**Figure 3.2 Structure of the Case Studies: Analysis**

The next sub-section discusses each of these analysis techniques in detail.

#### *Determining the Meaning of ICT Use, Display, and Life Satisfaction*

The process of analysis to determine meaning involved a process of bracketing, reconstructing, and contextualizing the phenomenon of ICT use by older adults. The stories and personal biographies generated from each case were gathered. Each transcript was then bracketed: the event was examined like a text; devoid of the context. Key phrases were identified, interpreted by myself, and the participants' meanings of these phrases were gathered. These meanings were examined in terms of what they told the researcher about ICT usage, display, meanings, and expectations. This bracketing process

resulted in a tentative statement by the researcher about the essential features of a phenomenon (Denzin, 2001).

I then took these bracketed elements and attempted to reconstruct the phenomenon. The bracketed elements were then listed (ordering how they occur) and then individuated in how they were interrelated. Finally, the phenomenon was contextualized, with themes and structure connected the biography, social environments, and history of the individual. This step also involved comparing the themes of stories to other stories that are similar or contrasting within the case and between cases (Denzin, 2001).

The final stage in this process, though highly interpretative in nature, was very similar to the case analysis strategies proposed by Yin (2009), and included strategies such as pattern matching (exploring rival explanations for similar outcomes), explanation building (developing explanations from a single case and comparing it to others), and cross-case analysis (where cases were compared to understand differing outcomes). Using the interpretative interaction approach of bracketing to understand meaning, use and display for each case, I then used these case analysis methods to analyze differences and similarities for the case outcomes. Much of this work was done in tandem with memoing.

### *Emergent Analysis of Themes*

Emergent analysis of themes was used to understand the types of ICTs used, the factors that appear to influence their usage, and the differences in use across contexts (Bogdan & Biklen, 2003; Bogdan & Taylor, 1975). This part of the analysis was not

focused on meaning or life satisfaction, but rather on the mediating variables of ICT usage, as presented in Figure 2.1, such as the introduction, ICT use routines, and display.

### *Analysis of Case Comparisons*

Comparison of the cases occurred on several levels in this study, as can be seen in Table 3.9. Three vital types of comparisons were made in the cases: comparisons within each case, theoretical comparisons between cases, and comparisons across the cases. Within-case comparisons used the cases singularly to compare technological use, meaning, and display across different life contexts and how expectations differed between the older adult and secondary participants. Between-case comparisons were where these outcomes (meaning, use, and display) were compared to each other based upon the theoretical sampling constructs of the case (gender and work). Across-case comparisons sought to understand how cases resulted in different outcomes in meaning, use, and display of ICTs based upon contextual factors.

**Table 3.7 Comparison of Cases: Differences and Similarities**

	<b>Within Case Comparisons</b>	<b>Between Case Comparisons</b>	<b>Across Case Comparisons</b>
<b>Description</b>	Comparisons within single cases across different life contexts and across primary and secondary participants  These results were then compared to other cases	Comparisons between cases outcomes due to theoretical case sampling constructs (gender and work)	Comparisons across cases, comparing cases that differed in outcomes as far as usage, display, meaning of ICTs, and life satisfaction (explored possible independent variables that may have caused these outcomes, although these variables were not used as sampling constructs)
<b>Comparisons Made</b>	Older Adult ICT usage, meaning, and display across life contexts	Between cases based upon gender	Explored differing outcomes by possible unforeseen contextual factors (education, income, etc.)
	Primary vs. Secondary Participants ICT Expectations for the Older Adult	Between cases based upon work status	Explored differing outcomes by life contexts
		Between cases based upon combinations of work and gender	Explored differing outcomes by birth-cohort of secondary participants
<b>Analysis Methods</b>	Pattern Matching	Pattern Matching	Cross-Case Analysis Explanation Building

Each of these comparisons used a different type of case analysis. Within case comparisons used pattern matching (Yin, 2009) to determine if patterns of ICT usage, meaning, and display were similar across different life contexts and if ICT usage expectations were similar between primary and secondary participants. Comparisons between cases used pattern matching: seeking to see if similar patterns were seen across these cases based upon the theoretical sampling variables (Yin, 2009) of gender and work. Cross-case analysis, or comparing cases based upon differing outcomes (Yin, 2009) in ICT usage, meaning, and display was used to compare across cases to determine important contextual variables that may have influenced usage. It was through cross-case analysis and the associated memoing that the user typology discussed in Chapter 4 was

developed. In addition, explanation building was used for individual cases, where a theory for a case was developed and then tested against other cases (Yin, 2009). Through explanation building, the user types were more fully developed to understand the nuanced differences between the domestication process between the user types.

The following chapter explores the significant findings from this study.

## **Chapter 4 : Results and Findings**

This research set out to document and explore how older adults were using ICTs in their everyday lives, with a particular focus on how they had domesticated ICTs into their family, work, community, and leisure lives. While a significant part of this chapter does concentrate on answering those questions, a larger theory of user types emerged from the data which sheds light on why older adults are choosing to use or not use ICTs in their everyday lives in these different contexts. In exploring the domestication process by members of the Lucky Few birth cohort, it was found that the domestication of ICTs differed depending upon the user type, with each type having distinct differences in how they were introduced to, used, displayed, and most importantly, the meaning they assigned to ICTs.

This chapter begins with a brief introduction of the participants in the study and is followed by a broad description of the five user types that were discovered, and then discusses the domestication process (introduction, use, display, and meaning) across the five types. The final section of this chapter discusses several findings from the study that go beyond user types that emerged across the cases in cross-case analysis.

### **Case Descriptions**

The following section details the women and men who participated in the study, including their work trajectory, economic status, family life, hobbies, and other interesting facts about each case/ participant.

For the study, 17 cases were completed. These 17 primary participants are described by gender and work status (the two sampling criteria) in the table below:

**Table 4.1 Gender and Work Status of Primary Participants**

	<b>Full Time Work</b>	<b>Part Time Work</b>	<b>Retired</b>	<b>Stayed at Home</b>	<b>Totals</b>
<b>Male</b>	Boris Harry	Fred George	Cleveland Jack Dan	-	<b>7</b>
<b>Female</b>	Alice Belinda	Jackie	Gwen June Margaret Nancy Natalie	Mary Mindy Jean	<b>10</b>
<b>Totals</b>	<b>4</b>	<b>3</b>	<b>8</b>	<b>2</b>	<b>17</b>

The table below briefly summarizes each case, including the participant's birth years, birth cohort, and secondary participants.

**Table 4.2 Description of Cases: Primary and Secondary Participants<sup>10</sup>**

<b>Primary Participant</b>	<b>Primary Participant Birth Year (Lucky Few)</b>	<b>Secondary Participant</b>	<b>Relationship</b>	<b>Secondary Participant Birth Year</b>	<b>Secondary Participant Birth Cohort</b>
Boris	1943	Martha	wife	1950	Boomer
		Erica	daughter	1964	Boomer
		Paul	friend coworker	1938	Lucky Few
Harry	1945	Patty	friend coworker	1952	Boomer
		Katrina	daughter	1984	Millennial
Alice	1945	Fred	romantic partner	1938	Lucky Few
		Chloe	former roommate friend	1969	Gen X
		Julie	former neighbor "sister," friend	1953	Boomer
Belinda	1946	Ted	son	1979	Gen X
		Melody	friend mentoree former coworker	1972	Gen X
		Peggy	friend professional colleague	1947	Boomer

<sup>10</sup> All names are pseudonyms.

Primary Participant	Primary Participant Birth Year (Lucky Few)	Secondary Participant	Relationship	Secondary Participant Birth Year	Secondary Participant Birth Cohort
Fred	1938	Alice	romantic partner	1945	Lucky Few
		Mike	friend	1954	Boomer
George	1942				
Jackie	1945				
Cleveland	1944				
Jack	1938	Martha	wife	1946	Lucky Few
		Allison	daughter	1977	Gen X
		Adrienne	daughter	1974	Gen X
Dan	1939	Dilly	cousin friend	1953	Boomer
		Rachel	former coworker friend		
Gwen	1946	Laura	neighbor friend	1960	Boomer
		Veronica	neighbor friend	1962	Boomer
June	1938				
Margaret	1938	Charles	neighbor "son" friend	1964	Boomer
		Amanda	"sister" friend	1947	Boomer
		Bob	friend	1928	Great Warrior
Nancy	1938	Bobbie	fellow resident friend	1951	Boomer
		Bette	daughter	1964	Boomer
		Daniel	"sister" friend	1949	Boomer
Natalie	1943	Minnie	friend	1947	Boomer
		Jackie	friend	1945	Lucky Few
Mary	1944	Kathy	niece	1954	Boomer
		Melody	sister-in-law	1939	Lucky Few
Mindy Jean	1941	Sally	friend	1939	Lucky Few
		Ruby	friend	1948	Boomer

The following section describes each of these primary participants in detail.

## Description of Participants

**Boris** is a white male who describes himself as “country folk.” He currently lives in a rural area outside of a small village of approximately 200 people in the northeastern part of the US.

*First Impressions:* Boris’ home is an A-Frame structure, nestled in the woods on a hill above a small creek. He dressed in flannel shirts and jeans and smoked heavily during our interviews.

*Education:* High school degree.

*Work:* Boris originally joined the military and worked on nuclear weapons technology before his discharge. When he returned home, he entered into business with his father in garage door installation. Roughly a decade later, he started his own construction business. He works slightly more than full time in the spring, summer, and fall; and part time in the winter.

*Marriage & Family History:* Boris has been married twice. He is divorced from his first wife (with which he had two daughters) and is married to his second wife who also has a daughter.

*Hobbies:* Boris remodeled the entire inside of his home. He is also a stained glass artist and occasionally sells pieces through a local boutique.

*Community:* Boris is active in “Area X” a local charity that provides food, housing, and clothing assistance to the local community. He mainly participates in no-cost home improvements, such as installing installation, windows, and repairing roofs for low income families in the area.

*Exposure to ICTs:* Boris’s first exposure to ICTs occurred in the military. When he started his own construction company in the mid-1980s, he bought his first computer for record keeping. He has used a pay-as-you-go cell phone for the past several years.

**Harry** is a white male who describes himself as a “mechanics freak” who loves “toys” (ICTs). He currently lives in a rural area outside of a small city of approximately 50,000 people in the northeastern US.

*First Impressions:* Harry invited me to interview him in his office on a university campus during an extended lunch hour. He relayed that his wife was quite ill (cancer) and therefore did not want to bother her with meeting at home. He dressed in kakis and button down shirts.

*Education:* GED (General Equivalency Diploma); some college

*Work:* Harry joined the military (earning a GED). After seeing active combat in Vietnam, he moved to a small town in the northeastern United States. He married and worked as a mechanic, race car driver, and real estate agent. He became an IT professional (mainly systems administration, but also technical support) in the 1970s when he moved to his current city.

*Marriage & Family History:* Harry has been married twice. He has a step-son and two daughters. He has two grandchildren from his step-son.

*Hobbies:* Harry is an art photography buff, reader of technical and political blogs, and a racing and sports car enthusiast.

*Community:* Harry is active in local politics and his local government. He is also a mentor/ instructor for a downhill and cross-country skiing program for special needs children and adults.

*Exposure to ICTS:* Harry has been a tinkerer since childhood. In the military, he was exposed to many different communication devices. He became an IT professional because of his interest in IT at a time when there was little to no formal education for IT professionals.

**Alice** is a white woman who describes herself as a nurse who is interested in “death and dying” (including how people use art in mourning) and a “total photography buff.” She currently lives in a medium sized city in the northeastern U.S.

*First Impressions:* Alice’s home is filled with photographs she has taken of cemetery art (mainly statuary and grave stones). When the home was built, she had a state of the art darkroom installed in her basement, which she no longer uses as she has switched to digital photography.

*Education:* Alice holds an A.S. in nursing, an A.S. in photography, and a B.A. in photography.

*Work:* Alice originally started her career as a secretary and a medic, working for a firefighting equipment manufacturer. Upon her divorce, she realized that she could not support her two children on her income, and so she became a home health care nurse.

*Relationship & Family History:* Alice’s partner, Fred (also a participant), cohabitates with her 2 days a week. She is divorced and has two surviving children, a son and a daughter.

*Hobbies:* Digital photography is her major hobby. She also enjoys reading, television, and learning about cemetery, cemetery art, and the use of art and photography in mourning.

*Community Involvement:* Alice is involved in her neighborhood association and helping to care for her neighbors.

*Exposure to ICTs:* Alice was exposed to the television, radio, and telephone in childhood. She was encouraged to purchase a computer in the early 1990s to get on the internet by a friend. She is an enthusiastic Smartphone user.

**Belinda** is a white woman who describes herself as a librarian educator, something which she finds critically important. She currently lives in a house in a medium-sized city in the northeastern United States.

*First Impressions:* I met with Belinda at her home filled with her collection of books. She wore slacks and sweaters at her interviews.

*Education:* B.S. in Education; M.L.S. (Library Science); Professional Doctorate

*Work:* Belinda originally was trained as a teacher in college. Following a move out west, she could no longer find a teaching position so she began working for a film company, during which she became interested in the use of media in education and learning. She then pursued an M.L.S. degree and became a library educator in a school district.

Eventually she advanced to administration. Following her obtainment of a professional doctorate, she recently joined the academic faculty of a large research university teaching in their library science program.

*Relationship & Family History:* Belinda is divorced (married once) and single. She has two sons.

*Hobbies:* Belinda is a self-described “workaholic,” and has very little time for leisure activities.

*Community Involvement:* Belinda is active in many library professional organizations on a volunteer basis, including several national and local organizations.

*Exposure to ICTs:* Belinda primarily speaks about her first exposure to ICTs being through her work as an educator and during her time working for a film media company. She works extensively with ICTs in her current profession.

**Fred** is a white male who tends to describe himself as a “lover of all things IT.” He originally spent summers near the small city in the northeastern United States where he now lives.

*First Impressions:* I met Fred at his romantic partner’s home (Alice, a fellow participant) as he lived quite a distance from me during the other five days of the week.

*Education:* B.A. (social work) and completed coursework towards a M. Ed.

*Work:* Fred originally trained to be a social worker. He began to seek training in educating the deaf after experience with a deaf family. He worked in several states teaching K-12 deaf students, eventually landing in an IT position at a school for the deaf. He currently teaches older adults computer and photography skills at a local community college part time.

*Relationship & Family History:* Fred is divorced (married once) and has a semi-live-in partner (Alice, also a participant.) He lives with Alice two days a week. He has three sons.

*Hobbies:* Fred, who once worked as a wedding photographer, now sees photography as his main hobby. His photography interests center around cemetery art. He is a well known expert on gravestones in several amateur and professional cemetery associations.

*Community Involvement:* Although he is paid to teach several of the courses, one of the courses he teaches, Computers for Seniors, he does on a volunteer basis once a week.

*Exposure to ICTs:* Fred was often given radios to deconstruct and repair by his father. As a teen, he often worked with his friends tinkering with cars and their sound systems. He later became an IT professional because of his interest and is an avid ICT consumer and user.

**George** is a white male who describes himself as someone with a “sense of humor.” He and his wife moved to a small village outside of a mid-sized city in the Northeastern U.S. in their 20s.

*First Impressions:* George has a dry sense of humor and requested on my first meeting with him that I use the pseudonym “George Clooney.” He considers professional dress to be an extremely important part of his life both at work and at home.

*Education:* High School Diploma.

*Work:* George worked his way up to a pharmaceutical executive. When he retired from his position in 2006, his wife said they “needed to find him a job to keep him out of my hair.” He applied for and was offered a position as a sales associate for a department store retailer. He works three days a week for approximately 24 hours a week.

*Relationship & Family History:* George is married to Mindy Jean (also a participant), when they were 20 and 19 respectively. They have 3 children, with 6 grandchildren.

*Hobbies:* George is a sports fan, enjoys PBS masterpiece theatre, and enjoys reading. He also enjoys yard work and meeting friends on a daily basis at the local coffee house.

*Community Involvement:* George is not active in his community.

*Exposure to ICTs:* As a result of his position in the company, George was required to learn to use computers and have a cell phone in the 1990s. He uses his desktop to check the news and weather and has a cell phone for emergencies.

**Jackie** is a white female who lives outside of a mid-sized city in the northeastern United States as self-described “conservative hippy.” She is recently widowed and is preparing to live in a travel trailer to save money.

*First Impressions:* Jackie dressed mainly in tie-dye and jeans, with long hair, and large jewelry. I met her first at a neutral location (a local café) then I went to her sparsely furnished apartment.

*Education:* High School Diploma, some college (3 years completed towards an Art Degree)

*Work:* Jackie originally began her career in the insurance industry in the U.S. at age 18, but during her second divorce she fled to Canada to escape her abusive husband. She worked herself up to an executive position in a different company before her health deteriorated and she was forced to retire. Since retirement she has worked as a seasonal retail worker, a museum guide, and an administrative assistant. Recently she has worked part time as a server to support herself.

*Relationship & Family History:* Jackie was married and divorced three times. She has one son and two grandchildren. Although she and her fourth “husband” lived together for 10 years they were not officially married. This means that legally she cannot collect his social security or retirement benefits, which has left her in a dangerous financial position.

*Hobbies:* Jackie’s largest hobby is digital photography.

*Community Involvement:* Jackie is active in the Tea Party political movement.

*Exposure to ICTs:* Jackie was exposed to ICTs mainly through her work in the insurance industry but also through her family. She was introduced to the internet by her son and late husband.

**Cleveland** is a white male who describes himself as a “family man who’s now retired from work.” He is married to Mary (another participant). He lives in a middle-class suburb located outside of a mid-sized city in the northeastern U.S.

*First Impressions:* Cleveland always dresses in a button down shirt and kakis. I interviewed him at his home, a 1950s two story house that sits on a cul-de-sac.

*Education:* High school diploma

*Work:* Cleveland worked extensively for a paper company from a starting management position at the firm and eventually retired as an executive from the company.

*Relationship & Family History:* Cleveland and Mary are deeply religious Catholics and faith is a huge part of their family life. He has five children and numerous grandchildren.

*Hobbies:* Cleveland is an avid reader. He is actively involved in many church causes, including the Right to Life movement and several others.

*Community Involvement:* He mentors orphans from the Sudan as well as supporting individuals through the church that need temporary financial help.

*Exposure to ICTs:* Cleveland was mainly exposed to newer forms of ICTs through his work, particularly in his contacts with international clients. He views ICTs as mainly for work.

**Jack** is a self-described “wise cracker who likes technology.” He lives in a middle class suburb outside of a mid-sized city in the northeastern U.S.

*First Impressions:* I met Jack in his cape-cod style home, which was filled with hundreds of clocks. He enjoys fixing mechanical things. Typically he dressed in casual polo shirts and kakis.

*Education:* High School Degree

*Work:* In the past he worked as an electrician, then as a civilian with the Air Force’s super computer in the 1970s, before returning to being an electrician for local construction projects. He retired from being an electrician for a computer hardware company.

*Relationship & Family History:* Jack is married with two adult daughters. He has five grandchildren. He babysits three of the grandchildren five days a week for one of his daughters.

*Hobbies:* Both Jack and his wife enjoy gambling in casinos. H also enjoys fixing and purchasing antique and vintage clocks. Jack and his wife are voracious television watchers.

*Community Involvement:* Jack’s community involvement mainly focuses on contributing to volunteer and professional fire fighting and police organizations.

*Exposure to ICTs:* Jack has always enjoyed mechanical things. His first exposure to computers was during the 1970s. His final job provided a beeper and later a cell phone, which encouraged him to purchase a cell phone when he retired.

**Dan** is a white male self-described “caretaker” for his mother. He lives in an extremely rural area outside of a small city in the northeastern United States.

*First Impressions:* Dan was often obviously stressed due to caretaking when I met with him. He typically dressed in dress pants and button down shirts. One interview occurred in his mother’s home while the final two interviews occurred at his home in a rural location overlooking a lake.

*Education:* B.S. & M.Ed. (education), Ph.D. (international development)

*Work:* Dan began his career as a school teacher, eventually becoming a school superintendent. After his divorce, he realized that his interests were in program development, and pursued a Ph.D. in international development. He spent several decades working overseas directing programs for a non-profit international development organization. When his mother’s health deteriorated, he and his second wife returned to the community in which they grew up. He considers himself “semi-retired.” He hopes to start consulting again.

*Relationship & Family History:* Dan has been married twice and divorced once. He had three children. He cares for his mother from 10am until 10pm each day.

*Hobbies:* Due to his consuming work caring for his mother, he had little time to have hobbies. He enjoyed reading and watching movies previously.

*Community Involvement:* Due to his caretaking Dan's community involvement has been significantly cut.

*Exposure to ICTs:* During his time overseas, much of the ICTs available in the U.S. were not available (such as computers and cell phones). Therefore, his exposure to ICTs before he returned to the U.S. was mainly to telephones and the television.

**Gwen** is an African American<sup>11</sup> woman who describes herself as someone who just "wants to help people." She lives in Section 8 housing (private housing that the government pays for a voucher for qualifying residents to stay in) in a suburb outside of a mid-sized city in the northeastern U.S.

*First Impressions:* Gwen always wore a hat with a flower on it whenever she went out of her home and always dressed in dresses. Her cell phone constantly rang and we were frequently interrupted by knocks on her door by neighbors during the interviews.

*Education:* 2-year nursing program, secretarial/ administrative training

*Work:* Gwen originally left her family's home when she was 16 and had a child, as her mother threatened to put the child up for adoption. A couple took her in and sent her to nursing school. She returned to the same city she grew up in and worked as a nurse. When in her 40s, she could not return to nursing because of PTSD due to a personal event. She was retrained as a secretary, which she worked as until she retired.

*Relationship & Family History:* Gwen is divorced and has five children. She has 27 grand children and several great-grandchildren.

*Hobbies:* Gwen likes to write and to take digital photographs. Her main hobby, however, is being involved with her family and community.

*Community Involvement:* Gwen is a full-time classroom aid volunteer at the city school district. She also is a mentor (she calls herself a "grandmother") to many of the children and other residents where she lives. She provides snacks to the children, advice to residents about saving and work, and also runs a small food pantry for residents.

*Exposure to ICTs:* Gwen's formal training with ICTs such as computers and cell phones started when she was trained as a secretary. Most of her current exposure to ICTs occurs through family members.

**June** is a black woman who moved to a mid-sized city in the northeastern U.S. after retiring from her job as a legal secretary in a large city. She asked God where she could do the best work and he "led" her to a small apartment in a low-income independent senior facility.

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<sup>11</sup> Gwen and June were two women who identified as African American and/or Black. Throughout this study I asked participants to share their racial and ethnic identity. Gwen stated that she loved the term African American and she felt it truly described her experience. June identified more with the racial term of Black, stating that she saw everyone as "God's children" but when she looked at herself in the mirror she saw her skin was black. She felt that the term African American was a "soft term" that watered down her experience of being a Black woman. In these case descriptions, I have chosen to use the terms that these women self identified with. Calling people by their chosen identities rather than applying researcher's terms for entire groups of people has been called for by researchers and writers (American Psychological Association, 2009). I personally believe it is a good practice to follow as I also wish to be called by my own chosen identity (that reflects my own experience) rather than an applied label. For the rest of this document I will use the term African American/ Black to refer to these two ladies to capture both of their experiences and preferred terms when speaking of race.

*First Impressions:* June's apartment was small but she had very nice furniture. She always had the television on during the interviews. At times June was difficult to talk to and would respond to my questions (which she sometimes seemed to think were prying) with yes or no answers.

*Education:* Associates Degree (Administrative Assistant)

*Work:* June trained as a legal secretary. She originally worked in a city office (as a public service employee) but later went and worked for a private law firm. She is now retired.

*Relationship & Family History:* June is divorced and has three children. She has several grandchildren.

*Hobbies:* June is a huge television fan. Whenever she is home she is listening or watching the TV. Besides television, June also likes listening to music and singing.

*Community Involvement:* June volunteers for a local nursery school as an aid five days a week.

*Exposure to ICTs:* June was exposed to computers mainly through her work. All of her current ICTs- from her phone to her cell phone to her computer- were gifts from her family members or friends

**Margaret** is a white woman who lives outside of a large village in the northeastern part of the U.S. She describes herself as being "very busy and active."

*First Impressions:* Margaret's home is a low ranch built into a hill. Her home is decorated in mainly colonial and 1940s furniture, with very few technologies in sight.

*Education:* Associates Degree (Business)

*Work:* Margaret worked as a secretary/ administrative assistant for two years following high school until the birth of her first child. She then stayed at home for over 20 years, raising her three children. When her marriage began to split up, she went back to school and took a job working in the financial services industry as an assistant sales manager for a broker. She is retired.

*Relationship & Family History:* Margaret was married once, and divorced after over 20 years of marriage. She lives with her romantic partner. She has three children and one grandchild.

*Hobbies:* Margaret is a voracious reader and movie buff. She belongs to a local book club that meets monthly and is a huge supporter of a small local bookstore. She also enjoys gardening.

*Community Involvement:* Margaret volunteers with a local music festival and is also very involved in buying local services and products.

*Exposure to ICTs:* Margaret has very fond memories of television from her childhood. During her career, her supervisor "protected" her from computers in the office, but eventually she was forced to use a computer in work. She uses a computer and cell phone.

**Nancy** is a white woman who currently lives in a Medicaid assisted living facility in a mid-sized Northeastern U.S. city. She is the self-described "mother" of her facility.

*First Impressions:* Nancy is a cheerful woman who walks with a walker. Her room is small and dominated by her bed and a large flat screen TV, a gift from one of her good friends.

*Education:* M.S. in Health Administration

*Work:* Nancy worked as a nurse and later as a nurse administrator for a hospital. When she became ill in 2001, she retired. She asked her children to find her an assisted living facility.

*Relationship & Family History:* Nancy is widowed, has three biological children, eight sponsored children, and many grandchildren. The sponsored children did not live with her family but at a local orphanage.

*Hobbies:* Nancy loves to watch television, crochet, and visit with others. With her crochet, she often makes items for other residents and charity opportunities.

*Community Involvement:* Nancy is often leads games and other socializing events, for 10 years she was president for the resident's association, and also is an advocate for the other patients. She runs a small store in the facility (her own idea to start) that sells personal items. The money raised from the store goes into a fund to help residents who cannot afford necessities.

*Exposure to ICTs:* Nancy used computer systems during her work. Throughout her life she has always been incredibly involved in her community, which means that she has relied on the telephone to keep her connected to others.

**Natalie** is a white woman who lives in an upper-middle class suburb outside of a mid-sized city in the northeastern U.S. She describes herself as being “very busy” and having “very little time.”

*First Impressions:* For the first two interviews, I met Natalie in a nearby café. The first time I went to her house was for the third interview. Natalie is a hoarder, and has essentially packed every room in her house following her divorce (most of the rooms cannot be walked through).

*Education:* B.S. Biology

*Work:* Natalie went to work for a biological testing company after college with her husband. She then left the company to work for a business she and her husband built. She worked first full time and then later part time at their own business. The business was sold following her divorce.

*Relationship & Family History:* Natalie is divorced and single. She has one child who no longer speaks or sees her. She has one grandchild she has never met.

*Hobbies:* Natalie is an avid horseback rider, crafter (sewing and fiber arts), and scrap-booker.

*Community Involvement:* Natalie is a very active Tea Party participant.

*Exposure to ICTs:* Natalie was exposed to the telephone and television from early life. In work, she did not use a computer, fax, or copier, as she had a “secretary to do that for me.” During her divorce, she became convinced that her husband was cheating the business, so she learned to install a keystroke tracker on her husband's computer with her cousin's help, her first exposure to using computers. She uses her computer extensively for research on her hobbies and political interests.

**Mary** is a white housewife who is married to Cleveland (another participant in the study). She lives in a middle-class suburb located outside of a mid-sized city in the northeastern U.S. Mary is hard of hearing and uses hearing aids.

*First Impressions:* Mary often dresses in jeans and sweaters when I meet her. I interviewed her at their home, a 1950s two story house that sits on a cul-de-sac.

*Education:* A.S. in Dental Hygiene

*Work:* Mary worked for two years as a hygienist. She then chose to stay home with her children. She now talks about how she and her husband are “retired” as he has recently retired.

*Relationship & Family History:* Mary is married, has 5 children and over 10 grandchildren.

*Hobbies:* Mary is active in her church and church related activities, which mainly fall into the community involvement category. She is also writing a book about her family life and faith.

*Community Involvement:* Mary’s community activities include mentoring children from the Sudan, being active in the pro-life cause, and caring for individuals who are ill or shut in.

*Exposure to ICTs:* Mary was exposed to the telephone and television in early life. Her first exposure to the computer was when her daughter left her computer at home for her parents to use. She later began to use a cell phone when her husband bought her one as a gift. She is currently learning to text.

**Mindy Jean** is a white woman married to George. She lives in a two story home in a small village in the northeastern U.S.

*First Impressions:* Mindy Jean and I held our interviews in her kitchen. She takes a huge amount of pride in decorating her home, which she sees as a wifely duty. (George and Mindy Jean have a relationship built on traditional gender roles.) She wears jeans and tends to be very causal.

*Education:* High School Degree

*Work:* Mindy Jean worked for two years as a secretary before she was married. Since then she has chosen to stay at home to raise her children and later be a housewife.

*Relationship & Family History:* Mindy Jean has been married for 50 years to her husband George (who is also a participant in the study). They have 3 children and 6 grandchildren.

*Hobbies:* Mindy Jean is a prolific crafter, mainly focusing on paper crafts such a scrapbooking and making cards. She meets weekly with two friends (her secondary participants) to craft.

*Community Involvement:* Mindy Jean used to be more active in volunteering for the local school, but since she has been babysitting her grandchild everyday she has no time to do so.

*Early Exposure to ICTs:* Mindy Jean was exposed to telephone, radio, and later television when she was quite young, especially soap operas (which she first listened to on the radio as a child). She is a prolific user of television and radio to this day. Her husband had bought her a Netbook over a year ago, which she has only used a few times.

The next section of this chapter describes the user types discovered in the study.

### User Types

Five user types were found in the study: *Enthusiasts* tend to view ICTs as toys, *Practicalists* view ICTs as tools, *Socializers* view ICTs as connectors, *Traditionalists* view old ICTs as better, and *Guardians* view ICTs as allowing individuals to wallow in negative traits and behaviors. The following table describes each of these five types and how they view ICTs, their formative experiences with ICTs, and other defining features about each user type.

**Table 4.3 Description of the Five User Types, their perspectives, formative experiences, and other defining traits**

Type	Description	Example of Viewpoint: Cell phone	ICTs viewed as	Question about a new ICT	Formative Experiences with ICTs	Other Defining Traits
Enthusiasts	Enthusiasts love ICTs and find them fascinating. They tend to be early adopters and explorers of ICTs. Although (like all these types) they often have frustration with ICTs; they tend to be willing to experiment and want to do things on their own.	“I couldn’t live without my smartphone!”  “What apps do you have?”	Toys	Is it fun?	Typically exposed to technologies early (often in childhood or young adulthood) and are self-led learners “I took apart radios in my teens for fun.”	Enthusiasts tend to be very aware of new forms of ICTs, which they learn through friends, family, trade publications, work, etc.
Practicalists	View ICTs as tools which allow them to get a task done. If a new ICT is used or not depends upon how useful it will be.	“The cell phone is for my use. I often leave it off or in the car.”	Tools	Is it useful?	Often exposed to ICTs in early work; occasionally childhood exposure to mechanical side of technology	Tend to have medium sized social networks, without much generational diversity. Tend to have a good knowledge of the ICTs that are available.
Socializers	Socializers view ICTs as vital forms of communication. They actively want to learn new technologies that others in their multi-generational networks are using, what they use is often determined by what younger birth-cohorts are using in their network.	“If I didn’t have a cell phone, how would I possibly stay in touch with my grands?”	Devices that connect me to others	Does it connect me to others (younger generations)?	Often had positive experiences with ICTs in work; however, mostly influenced by large social networks	Have large multi-generational social networks and are deeply involved in their communities.
Traditionalists	Traditionalists assume that older forms of ICTs are better than newer forms. They will adopt newer forms of ICTs if proven that they add something additional beyond the older form.	“I want people to call me on my landline.”	Older ICTs are better	Is the new ICT better than the old ICT?	Tend not to have had extremely positive or negative experiences with ICTs; often less exposure through work or family.	Tend to be surrounded by individuals who are technically capable and rely heavily on them. Family is extremely willing to adopt and support the older adults’ traditional use.

<b>Type</b>	<b>Description</b>	<b>Example of Viewpoint: Cell phone</b>	<b>ICTs viewed as</b>	<b>Question about a new ICT</b>	<b>Formative Experiences with ICTs</b>	<b>Other Defining Traits</b>
<b>Guardians</b>	Guardians do not tend to view ICTs as negative in themselves, but are very concerned that they allow individuals to bask and/or wallow in negative traits. The problem is not the technology itself, but a lack of boundaries, social awareness, and care about the media and society.	“I worry that cell phones are destroying young people’s ability to communicate.”	Potentially Negative Impacts on Society	Is this good for society?	Tend to have had highly negative experiences with ICTs in family and/or work life.	Question if society is on the right path. Have a mistrust of ICTs and most modern media.

The following sections briefly describe each type, including their defining characteristics.

*Enthusiasts: “The Gadget Girls/ Gadget Guys”*

Enthusiasts are essentially individuals who always have the latest and greatest devices and push those devices to their limits. They view ICTs in a very positive light, fill their homes with the latest technology, and are self-described gadget lovers. ICTs are fun toys. They revel in technology and often have technologically orientated careers, with many working within the IT sector (Harry and Fred). If enthusiasts do not work directly with IT in their jobs, they seek to bring the “power of computers” (Alice) into their workplace.

Enthusiasts tend to surround themselves with other enthusiasts, either in their work or family lives. They are often “the tech person” in the family, suggesting that they are the primary contact person in the family for technical support-- often for individuals of various ages. They glean information about new ICTs from the media and other enthusiasts.

*Practicalists: “The Rational Technology Choosers”*

Practicalists view technology primarily as a tool: it is not so much fun as a specific device which fulfills a specific purpose. They tend to have a positive view of ICTs, but mainly decide to try a new device because it is “useful” rather than because it is “fun” (unlike Enthusiasts). ICTs need to be practical and fit their lifestyles and needs. Practicalists often worked closely with IT in their current or previous jobs, although they were not IT professionals per se. For instance, Belinda worked as school librarian and later became an academic, Jack worked as a repairman and electrician, and Boris worked

in the military on nuclear technology and later became a general contractor. Practicalists see ICTs as primarily being for their own use, for instance, all of the participants in this study often left their cell phones off unless they needed to make a call.

Practicalists were often influenced by their work in ICT use, with most ICT devices being influenced either directly (such as work mandating their use) or indirectly (such as seeing a device being used by colleagues). In retirement, practicalists often continue using the devices they used in work, although they will try new devices if they see a use for a device which fits within their lives.

*Socializers: “The Technological Social Butterflies”*

Socializers tend to be well connected within their families and communities. They see ICTs as “connectors” which enable them to nurture, sustain, and make new contacts and help those contacts to succeed. Socializers tend to come from large families, and in particular, tend to have many children and grandchildren. They are very much caretakers and mentors, particularly to younger people in their families and communities. They are civically involved and tend to be religious. ICTs are seen as enablers to all of these activities. Socializers tend to prefer ICTs which connect them to others, particularly to younger birth cohorts.

Socializers tend to be exposed to new ICTs through their younger family and community members, and work very hard to learn new skills that allow them to continue to care and stay connected to others. They tend to be adaptable, flexible, and willing to learn the ICTs “of the younger generations” (Mary) in order to stay in touch.

*Traditionalists: “The Keepers of Technological Tradition”*

Traditionalists see little value in new forms of ICTs, preferring to use the technologies introduced to them in young or middle adulthood over newer forms. Old forms of ICTs, which are more familiar and comfortable, are seen as superior unless proven otherwise. If traditionalists use a computer, its use is extremely limited. Landlines are strongly preferred over cell phones’ although traditionalists do see value in cell phones for emergency communication.

Traditionalists tend to be exposed to new ICTs through family members and friends who often give the older adult newer forms of ICTs as gifts. Traditionalists often will try gifted ICTs. However, the use of these ICTs is often not sustained beyond a trial period. Traditionalists do not tend to view new ICTs negatively so much as they view older ICTs as positive and prefer what they are already comfortable with to newer ICTs.

*Guardians: “The Resistance Fighters in a Technological Society”*

Guardians tend to be the most cautious about new forms of ICTs than the other types. They view ICTs as allowing individuals to wallow or bask in negative traits. While the ICTs themselves are not seen as being “negative” or “evil,” they tap into natural human tendencies to be rude or lazy. At their best, ICTs are viewed as being capable of being used in correct ways by careful aware users (and often Guardians do believe they themselves use these ICTs in the correct way). At their worst, ICTs are instruments that allow individuals to develop and bask in the worst human traits; disrupt, isolate, and destroy families and friendships; and further lead to the decay of the educational system and society itself (particularly the decay of social skills and education of young people).

All of the Guardians had one negative experience with ICTs in their lives which highly influenced their viewpoints.

Unlike Traditionalists, Guardians are highly likely to use both new and old forms of ICTs in their daily lives; however, they tend to be very selective about which ICTs they choose to use and how they use them. They base these decisions on the potential negative effects of such a technology on society. While they see no technological development as “bad” in of itself, they can easily spot how individuals can use the development in a way that is ethically, morally, or socially negative for society.

The next section of this paper explores the domestication process by user type in detail, including differences in how each user type is introduced to, uses, displays, and comes to assign meaning to ICTs.

### **The Domestication process by User Type**

The domestication process indicates important areas to consider when studying how individuals live with ICTs in their daily lives, including how they are introduced to, use, display, and how ICTs come to develop meaning to individuals. The table below provides an overview of how the domestication process differs for each of the five user types.

**Table 4.4 Domestication Process Across the Five User Types**

Type	Domestication Process			
	Introduction	Use	Display	Meaning
<b>Enthusiast</b>	Introduced through all contexts and relationships as ICT sharing is an important part of relationships. Often the enthusiast introduces and shares new ICTs with others. Often involved in the IT or related professions.	ICTs are used in every aspect of the Enthusiast's life. The enthusiast constantly seeks new ways to integrate ICTs more fully into their lives. Tend to use the latest categories of devices (within the limits of income and skill availability).	ICTs dominate the home; the home is often arranged around ICTs or ICTs are found in every room and displayed proudly.	ICTs are seen as "Fun" and "Toys." Exploring new forms of ICTs, "playing" with and using them is a highlight of these individual's lives.
<b>Practicalist</b>	Mainly through work and family; typically work jobs which require them to heavily use ICTs.	Tend to use ICTs for very specific uses- can easily identify which ICTs are used for work, leisure, community, etc. ICTs tend to be compartmentalized with their purpose. Tend to see their devices as predominately for their use.	ICTs have their "place" in the home associated with their use	ICTs are seen as "tools" and are "practical"- they tend to serve a specific purpose in the individual's life.
<b>Socializer</b>	Mainly through Family & Community relationships with most new ICTs being gifts from intergenerational contacts. Some work exposure.	Predominately use ICTs to connect with large intergenerational contacts. Very easily adapts to new ways of communicating, particularly if these ICTs are being used by younger contacts. Uses social networking, texting, and other forms of communication technology.	ICTs are never far from reach, stays in constant communication with others.	ICTs are seen as "Connectors" and "Communication Devices" that allow intergenerational contact with a large social network.
<b>Traditionalist</b>	Mainly through Family contacts; given as gifts. Some work exposure.	Will try new ICTs, however, most new ICTs are not incorporated into the individual's daily routine unless they are seen as superior (and most modern devices are not). Tends to be the most likely to have landlines and heavily use the television and radio.	Older forms of ICTs (such as TVs, Radios, etc.) are displayed proudly. Newer forms of ICTs are often "hidden" in an appropriate space.	Older forms of ICTs are preferable to newer forms. New ICTs are "complicated" whereas old ICTs are "reliable" and "work."

Type	Domestication Process			
	Introduction	Use	Display	Meaning
Guardian	Through a mix of self-purchase (for “good” uses of ICTs), work exposure, and as gifts from family members and friends.	Tend to use ICTs that are perceived as having “good uses” and tend to view their use as the “correct way.” Actively avoid and resist using ICTs they view as damaging to society. Tends to use basic cell phones, landlines, television, radio, and computers (email and internet) but are very selective in how they are used.	Newer forms of ICTs are hidden; there are areas in the home that should be “ICT free.”	ICTs are a societal concern- they allow individuals to bask in poor behaviors, encourage wastefulness, and allow corporations to dominate our lives.

The next sections of this paper consider the domestication process by its four stages and how it differs for each of the five types.

#### *Introduction to ICTs*

Introduction refers to the process by which individuals are first made aware of ICTs. In the domestication literature, two important conduits of introduction have been discussed: family and work (Lie & Sørensen, 1996). Although the literature on the importance of family members in the introduction process is well established (and supported by this study), work has only been addressed as a conceptual point of introduction in previous domestication studies. In the proposal of this study, it was suggested that gender, context (family, community, work, or leisure contexts), and relationships (family, community, work, or leisure relationships), all potentially impacted ICT use and this was found to be true.

Both work and family relationships and contexts are important means of introducing new ICTs to the older adults in this study, but other contexts are equally important, including leisure and community. However, for each of the five types, differences emerged in how they were introduced to ICTs, including distinct differences

in the contexts and relationships through which they were introduced to emerging ICTs. These differences are summarized briefly in the table below.

**Table 4.5 Contexts of Introduction to New Forms of ICTs by User Type**

User Type	Life Contexts								Media
	Family		Work		Leisure		Community		
	<i>Relationships</i>	<i>Tasks</i>	<i>Relationships</i>	<i>Tasks</i>	<i>Relationships</i>	<i>Tasks</i>	<i>Relationships</i>	<i>Tasks</i>	
<b>Enthusiasts</b>	X	X	X	X	X	X	X	X	X
<b>Practicalists</b>	X	X	X	X					
<b>Socializers</b>	X		X	X	X		X	X	
<b>Traditionalists</b>	X		X	X					
<b>Guardians</b>	X		X	X	X	X			X

As can be seen in the table, each of the five types has different points of introduction to new forms of ICTs. For all the types, both family relationships and work tasks were important points of introduction to new forms of ICTs. However, for socializers, family and community relationships and tasks were the most important; for traditionalists, families were the most important; and for the Guardians, leisure, family, and work introduced new ICTs into their lives. One of the emergent phenomena from this study was the importance of media in general in educating older adults about new devices, with the media being particularly important to both the enthusiasts and the guardians in learning about the latest ICTs and their uses. The next five sub sections of this chapter detail the introduction process for each of the user types.

#### *Introduction for the Enthusiasts*

Enthusiasts were often first exposed to ICTs in their childhoods, with their initial experiences with ICTs often being extremely positive. When the typical enthusiast thinks

about ICTs available in their childhood (the television, radio, and telephone most notably) it is often with the sense of nostalgia:

*I remember the first TV I saw... it was a little TV screen, in a big box. It was black and white. In the 50's there were only three channels in my city. After 11:30 at night the only thing on was a test pattern. That was the early 50's. It was amazing and so nobody on our street had a TV and then the one kid I hung around with on the street their family got a TV. We'd go down there and watch TV and they had the fights on Friday and that was about it. But it was amazing. Later they had movies on TV, you could watch the news... it was great! (Fred)*

Most enthusiasts pointed towards mentors (typically parents, teachers, or supervisors) who were influential in their exposure to ICTs at a young age. Not only did mentors encourage the young enthusiasts to use these ICTs, but often to “tinker” with them. They often were encouraged to take apart and repair old radios:

*My grandfather ran the service department at a car dealership in the 1920s. So my grandfather was an early adopter of technology and I grew up and around his shop. So I think I grew up with the love of technology. My grandfather was always messing with new things. There was a shortwave radio that was my granddads and it was a Zenith which in the 1950's was an equivalent of the iPod. I always used it in his office and when he passed away I got the radio. So I grew up in a technical environment, around cars being fixed and electronics. I was interested in electronics when I was a kid. My grandfather was the first kind of direct influence, and I don't really think anybody in particular really matched his influence on me. I got into ham radio in the Boy Scouts and I built a ham radio from a kit and did ham radio stuff and I really think that is because of my grandfather's encouragement. (Harry)*

*My father was a mathematician engineer and he was career Army. He was into technology and electronics, so he would come home and bring Collins radios and all kinds of stuff. So I guess from the time I was a kid there was stuff around to play with when he would let me play with anything he brought home, and I just got into it. I've always just had this thing for playing with technology. (Fred)*

Many enthusiasts took their tinkering beyond ICTs to other forms of technology, such as cars or appliances, which further interested them in the mechanical and later

micro-chip based world. Both Fred and Harry were involved in cars when they were young (Fred as a teen and Harry in his 20s):

*I was also fiddling in high school and college with car radios trying to beef up my car radio to make it not one speaker like they all had. I wanted five speakers if I could put them in. I've always just had a thing about machinery. (Fred)*

*So when I got out of the service I ended up going to college and I needed money. I gravitated towards cars, so I started selling cars for this little sports car dealership in a Midwest City. Some of the guys that were racing cars were having trouble keeping their cars running so I started making deals with them that I would rebuild their engine in return for being able to use their car to go through driver's school. You had to go through four or six races in driver's school and then you had to do six novice races. So the deal was that I would fix their car and for racing weekend I would use it for the novice race and they would use it for the more advanced race, so it worked out pretty well. So I ended up starting racing cars by working on them, I fixed them and stuff. Then after college I won a major motor race and I went off on kind of this quixotic exercise of becoming a professional racecar driver which didn't work out. But in the course of it I got quite a reputation for fixing racing cars and then street cars so I ended up with a car shop in North Eastern State. I became the go to guy for exotic cars like Porches and Jaguars and stuff like that because they required a little higher level of mechanical insight to do that... so I've always been interested in technology. Mechanics and technology. (Harry)*

As enthusiasts aged into adulthood, they often sought careers that were not necessarily IT related. Throughout their career trajectory, however, ICTs became increasingly important to them professionally and personally. While Fred was encouraged to be an engineer by his parents, he chose to be a social worker instead. Harry began his career in the military, after their promise that they could help him earn his high school equivalency diploma. Alice originally began her career as a secretary. Among the male enthusiasts, both later became IT professionals; Fred serving as the IT professional in his school and Harry becoming the technical support person for a university school program. Both Fred and Harry were drawn to these careers partially by accident, but also

because of their deep interest in technology in general and ICTs in specific. Oftentimes this “accidental” development into IT professionals was because of a recognized skill in the area by their bosses and coworkers:

*I really thought that when I grew up I wanted to be an aeronautical engineer. I didn't have a real drive for it and so in a way technology saved me. I had a really difficult relationship with my father, and I had some other problems. Maybe I was ADD or something- I had no idea- but I was a very bright student but I did not do well with authority. I had a lot of problems at home and I wasn't quite a delinquent but I probably wasn't far from becoming one. The reason I ended up in the Army was I wanted to be a pilot and no other service would take someone without a high school diploma. The Army said “since you're a little young for flight school you can go to helicopter mechanics school first.” So I became a helicopter mechanic and in that time I ended up not going to flight school. I ended up realizing three years in the Army was going to be enough. So I had a very vocational focus but a pretty high level education in both aircraft mechanics, structures, and in electronics for doing the systems and stuff like that. Then I went on to fix cars, because of my electronics and mechanical background. (Harry)*

*I started working in the physics lab and I'd always been interested in electronics and stuff. I built radios as a kid and I had gotten the electronics experience in the military. One of the reasons I got the job in the physics lab was being able to do electronics troubleshooting and maintenance; design and build power supplies, and stuff like that. That put me in touch with working on systems and that's how I came to do IT systems work. (Harry)*

Alice, as the only female enthusiast, had a slightly different career experience with technology. Like many other women in this study, she began and continues her career in an occupation traditionally held by women (pink collared occupation), first as a secretary and later as a nurse. However, she was always incredibly enthusiastic about ICTs on the job; something she relayed in her story about how she worked with her first word processor to make her work more efficient, which she recognized was a beneficial skill:

*Many years ago I was a nurse secretary in a big office. I had an electronic typewriter, which I programmed as much as I could. It made my job so much easier and efficient. When I left that office there was one secretary who was really a bitch and she said "oh when you leave I'd love to have your computer- your typewriter!" I said "oh sure!" I brought it into her and I said, "here's my typewriter," and what she didn't know is that I had erased all the programs I had put on there. I knew that she couldn't figure that out. I've always pushed the technology to make it work for me and I know that's a valuable skill- that's why I erased my typewriter's memory. (Alice)*

In many ways, Alice's exposure to ICTs through work was very similar to both Fred and Harry's. Although she did not specifically hold an IT career, she was always eager, and remains eager to explore new ICTs and how they may help her and others in her work:

*I think IT is great. I would encourage my home health nurse office to do more of it. I would prefer to e-mail a lot of stuff. I'm not a "going to the office person." I'd rather e-mail paperwork. But because of HIPAA they're antsy about privacy issues, so I can't even e-mail something that has a client's name. I find that absolutely ridiculous seeing as how other places such as other doctor's offices go electronically between each other etc, etc. (Alice)*

Since ICT's are so embedded in the Enthusiasts' lives and carry such important positive meaning to them, enthusiasts tend to seek relationships with and surround themselves with other Enthusiasts. Enthusiasts are therefore introduced to new ICTs through their relationships in family, work, and leisure with other enthusiasts. With enthusiasts, however, the introduction of technology is not purely one-sided as with many of the other types where relationships with others are the only or primary way new ICTs are introduced. Enthusiasts openly, willingly, and enthusiastically share their technological knowledge with others. Therefore, when enthusiasts flock together, it is often with mutual sharing of their ICT knowledge being shared between all parties. For

both Alice and Fred (romantic partners) and for Fred and his friend Mike, discussing ICTs is a major part of their relationship:

*Well Mike and I were friends to begin with so it was a mutual interest in technology... It was shortly after we met that we both had 286 computers. Mike started on Prodigy before I did, actually he was the one that talked me into giving it a shot. Well I went to his house and I had my original computer with two big 5 ¼ inch floppy disks. I'd see Prodigy advertised and I thought "well that's sort of interesting but I don't know." So I'd go to Mike's house and he'd go and show me Prodigy. He had e-mail which was something new. There were groups that you could join, so if you're a photographer you could get with all the photographers. After he showed it to me a couple of times and I thought, "Gee it's only \$4 a month I can do that" and so I got into it. Then it was a case of every five months getting a new modem that was just a tiny bit faster. So we were both interested in the computer. I guess he has an affinity for machines too. Actually we started with our shared interest in photography, but our love of technology grew from there. (Fred about his friend Mike)*

*I'm bolder than Fred is so I will go out and try something before he does, or I'll put my foot down and say "no I want to do this." He's always gifting me technology. Quite a few years ago my small color photo printer died and he said "well I'll get you another one" and he's looking at mid-priced ones. I had been working with another photographer and I learned about the more expensive printers. So I told Fred I'm going to buy the printer because I didn't want to ask him to buy a very expensive one. About two years after that they had come out with an even better one so then he bought that. It was the same thing with the Smartphone. Once we have the same stuff, we learn from each other. (Alice about Fred)*

For the enthusiasts, sharing both knowledge of and even ICTs themselves (such as Fred's gifting of ICTs to Alice) is what makes many of their relationships so fulfilling. This sharing of ICTs was seen in all the enthusiasts. It's important to note that two enthusiasts in this study, Alice and Fred, were romantic partners whom actually met online and through their shared love of technology and photography developed a romantic partnership:

*In the old days of Prodigy there was a photography board that I was on and this lady comes on looking for information about venting a dark room. So I sent her some information. So we message back and forth a little bit,*

*and then maybe a year later or quite a few months later here's this person looking for post mortem photography. I've been into cemetery things forever too, so I sent her a couple of e-mails on where to find some good cemetery stones and I suggested "well, why don't we get together?" We decided to meet because we lived close to each other. I said "well, would you like me to take you to a cemetery?" I know how to show a girl a good time. (Laughing.) So we went that day and it just started a friendship. This was 15 or 16 years ago. (Fred on his relationship with Alice)*

*I met Fred online, on a bulletin board. First, I was asking for help with my darkroom. Then later I was doing a class at my local community college on death and dying. I was interested in the use of photography in death and mourning. So I went back to the bulletin boards and the same man who helped me with the dark room said "I don't know if you remember me, but I helped you with your darkroom a while ago. I know some neat places in nearby cemeteries" So we met in person and we were friends first. Then we fell in love. (Alice on her relationship with Fred)*

ICTs remain an important part of Alice and Fred's relationship to this day and this sharing not only includes knowledge and use, but also includes giving ICTs as gifts. For the enthusiast, the ultimate gift to give or receive is an ICT:

*The last thing Fred got me as a gift was the new laptop. My bank is very good at internet security. A service representative there called me and said "we were tracking your purchases and we had one that does not sound right. It was yesterday morning and it was a \$200 withdrawal from an ATM on Main Street." And I was thinking where is Main Street? Then I realized it could be Fred! I asked the service representative for the account that it was drawn on. It was my joint account with Fred and I said "no that's fine." So then when I called Fred about it he said some bad words and he said "they've ruined my surprise!" The next day I come downstairs and there's the laptop with gift bows stuck on it. (Alice)*

Since Enthusiasts are constantly seeking to learn and integrate new ICT "gadgets" (Harry) into their lives, they tend to stretch every ICT they own into all of their life contexts. Therefore, they introduce ICTs into all of their various life contexts to accomplish tasks. If faced with a task, the enthusiast seeks out a technological solution. They constantly seek out new and better ways to do daily tasks through using ICTs they already own or are available:

*I started about six years ago putting as many recipes as I could put on my main computer. And I printed out a loose-leaf notebook for my daughter. Then I had a law student living here with me for a while and when she graduated I gave a similar one to her. I got to thinking, "why am I always printing out all this stuff? I have a computer." Fred gave me the little computer, a notebook I guess it's called, so I brought all those digital recipes down and put them on the notebook. So now all I do is if I'm looking for something that I don't have a recipe for, I just take the notebook and I go on the Internet. Then I cut and paste what I find into a Word document, and then I've got it right there. So I don't even really bother printing anything out anymore. (Alice)*

A final important mechanism of introduction, which has not been previously discussed in the domestication literature, is the role of media in introducing Enthusiasts to new forms of ICTs. Enthusiasts are often readers of technical columns in traditional newspapers, trade publications (even if they are not or no longer an IT professional), online technical blogs, and general news. They use these media outlets to remain abreast of new technological developments and to learn of new products:

*I had been reading Byte Magazine for years. I'd say Byte was a big mentor for me, that's how I got started in technology when I came to the area... I still read a lot of technical blogs. (Harry)*

*I read about stuff. I get the local paper so I read all the tech columns when they come out. Then often Fred and I discuss what I read. (Alice)*

While the enthusiast was often introduced to ICTs in a very positive way through their early childhood and various life contexts, this introduction process was remarkably different for the other types.

#### *Introduction for the Practicalists*

While practicalists were introduced to similar ICTs as most of the other types in childhood (including television, radio, and the telephone), they tended to not have the overwhelmingly positive and warm memories of “tinkering” or being “mentored” or “encouraged” to explore technology that enthusiasts have.

Much like the enthusiasts, practicalists often stumbled into exposure with ICTs in their working careers. While practicalists were likely to be exposed through ICTs in their work, they tended to not be directly involved in IT careers. Many of the careers that these individuals took (particularly the men) involved mechanical aspects (Jack and Boris) of technology:

*When I got out of high school, I went to work for a radio TV repair place. I was in electronics repair. I went to a technical high school and then I went into the Army. When I got out of the Army Reserves, I went to work full time for Western Union. I was an electronics printer and Tele-Tech repairman. Then I went to work at the Air Force Base where we had a computer line for the Department of Defense. I worked there for 25 years and then I left there and retired and got a pension from them. I worked at The Mall as an electrician when they were building that in 1989. Then when that got built I was all set for full retirement but my wife said they needed a plumber, an electrician, and a carpenter up at the Catholic Diocese, so I went to work there. I retired from there too. I can do just about anything, plumbing, electrical, carpentry... I'm mechanically inclined and electronically inclined. (Jack)*

*My dad was in business and he was a carpenter. He had his own garage door business and I helped him when I was going to high school. I was in the military seven years and when I came out I actually went to work with him. When he decided to retire I went and worked for a few other companies in that general area doing the same type of stuff. (Boris)*

Work is the practicalist's most important context that introduces them to new ICTs. Many practicalists work involves heavy use of ICTs. For instance, in Belinda's work as a library science educator, and later as a professor teaching library science educators, she worked extensively using ICTs in her teaching. Similarly, Cleveland was exposed to ICTs in his work as a sales executive for a paper company, particularly because he traveled frequently and was responsible for many overseas accounts. Boris was exposed to computers early in his work, mainly through the needs to maintain

accounts and billing for his construction business. All of these individuals were exposed to new ICTs through work relationships and tasks:

*I constantly am trying to push myself to use new tools like Symbaloo. What I am really trying to do is to see how I can use these in the context of librarianship. I try to figure out how these new tools can be used for research assignments for kids. I don't go out and search for these technologies, but if someone lets me know they are out there I try to figure out how to use them. (Belinda)*

*I first became aware of cell phones around 1990. The owner of the company got wind that this was the coming thing so he got a cell phone. The only way I can describe it is it looked like a WWII combat walkie-talkie. This thing was about 12 inches long and it weighed about 6 pounds. It had a keypad on it and you held it up and it was limited coverage. We used that for maybe a couple years and maybe he got another one. Maybe there was one or two that were being used, interchanged amongst the group in the office. But they were just terrible, erratic reception, etc. Then I went to Asia and I can remember spending a few days in Taiwan. It was a very crowded city, very, very busy; very, very hectic; very, very modern; very, very high tech. Everybody was walking along the street- I want to say almost everybody walking along the street was talking on a mobile phone. We were just flabbergasted that this technology that we thought was so difficult to get adjusted to was so common place in Asia. We felt like we were living out in the boondocks. So we came back and cell phones became a little bit more common place, a little bit more available, and a little bit better reception... So the cell phone activity in Europe and Asia was very common place, but the phones that we were getting here in this country weren't usable there at all. You'd have to go over there and if you wanted to make a cell phone call you'd have to buy a phone, which I did a few times and that worked out fine. I realized after a while that we're way far behind in this country in terms of global phone technology. (Cleveland)*

*The first computer I had was for the business- it was an inexpensive tool. You could do certain things with it, you could type a letter and you could print from it. But it was at least that 20 or 30 years ago. (Boris)*

Dan's case was different in that he was not directly exposed to ICTs until much later in his career than the other practicalists. Since he worked overseas with a non-profit group in developing nations, he was not exposed to many ICTs:

*I remember I was running a major project in Southern Africa and I didn't have computer skills. This was 40 years ago or so. In those days you had lots of other people who did computers for you: you had typists etc., etc. But even when we started with computers typists just switched over to computing. Now that's changed, now you're expected to have your own skills. I remember talking to a man who was a senior administrator and had retired from some agency in California. I said, "Allen do you think I should be learning the computer?" ... He said "well, you know Dan at your level, no; you shouldn't be using a computer. Other people should be doing this for you." (Dan)*

For Dan, his real exposure to new ICTs beyond the traditional land-line phone came when he and his wife came back to the U.S. following his last stint as a director for overseas projects. As a result, he was instantly thrown into a plethora of ICTs that had developed while he was overseas. Since he was now extensively networking with individuals overseas and across the United States, he found that he needed to learn to use the computer, internet, and other ICTs- which were essentially new forms of ICTs to him:

*I don't do PowerPoint but I always had people build [the presentations] for me. Maybe that's a disadvantage if you have other people do it. If you're at a certain level in an organization you have other people do things. Then you haven't really learned. So I could give a great PowerPoint presentation but somebody else had put it together. I'd really like to learn PowerPoint. (Dan)*

Practicalists tend to be self-purchasers of ICTs. Typically they know what they want in a device (and tend to be quite aware of different ICTs that are available) and then research (typically online and through friends) the particular item, and purchase it themselves:

*If it's something that is going to make your life easier, more pleasant, and you can afford it then you buy it. For years we had normal regular TV sets. They worked, they weren't great, but they worked. Two or three years ago both of us agreed that what we would do for Christmas instead of buying a bunch of dumb stuff we would buy a TV set. We researched them a little and talked with a bunch of people that had them. We went and looked at them in the store and bought one. Well then I had a chance to*

*buy a small flat screen for the bedroom at a pretty good price and again I checked with my computer guy to make sure it was a good deal. (Boris)*

The only time this was not observed to be the case was in relationships between practicalists and enthusiasts, as in the case with Dan, whose enthusiast wife often purchased ICTs in their relationship. Practicalists are often exposed to new forms of ICTs in their family relationships:

*Probably the only reason I have anything is because my wife has all of this [ICT] stuff. For all of this stuff I don't know what I would have if it weren't for her. Maybe I would have it all and maybe I wouldn't. It's her influence. She's a genius in this type of stuff; I just try to figure out how to use it. (Dan)*

While the enthusiasts actively seek out new forms of ICTs in their everyday lives, the practicalists tend to become aware of new forms of ICTs mainly through their work and family relationships. This is quite different from the socializers, who tend to be introduced to new forms of ICTs not only through family relationships, but also community and leisure relationships.

#### *Introduction for the Socializers*

The socializer's true interest in ICTs is in their use in "connecting" and "communicating" with others. Therefore, ICTs which enrich the socializer's ability to connect are typically those that are sought, and tend to be those that the socializer uses in her free time. Although one of the socializers, Gwen, had been introduced to ICTs in her work, the use of work ICTs was not as interesting as those that allowed her to communicate. Since Gwen no longer worked, she had no interest in or need to use ICTs other than those that allowed her to socialize, and therefore she only used those that allowed socialization. Similarly, Mary, who had chosen to stay at home to raise her

children and remained at home had no need for “work” related ICTs, chose instead to concentrate on socialization tools.

Socializers are most often introduced to new forms of ICTs through relationships. For socializers, relationships and the process of caring for and maintaining those relationships is extremely important. They tend to emphasize the importance of these relationships over tasks done in these contexts. ICTs are one way in which they can create and maintain those relationships, and therefore are seen in a very positive light:

*I've incorporated CD's in different languages and music in my life. My neighbor downstairs is from Beijing and we've been neighbors for 12 years. Mary will make me a CD of music from her country or her music in her tongue. We learn about each other that way. (Gwen)*

*My digital camera, I just loved it because I could capture, capture, capture. I could record. I love to capture moment by moment as the storm comes, the sky changes. I would keep the date on and the time. I could see from seconds, just really seconds to minutes, how things changed. It was just wonderful, just so wonderful. I sent my daughter and her husband a card that I made for their anniversary back in April. She said “Mom, this picture that you took was exactly a year ago on our anniversary!” So the date was there and the time and everything, so it captures everything. It lets me be connected to people in a way I otherwise couldn't. (Gwen)*

Since socializers have large intergenerational networks of family members and friends, they tend to hear about new ICTs from their children, grandchildren, and other members of younger birth cohorts:

*I learn a lot from the kids. I see what they use and how they use it. This past Christmas they were here and they were showing me their iPads and their iPhones. And I learn a lot from them about what you can do with the stuff. (Mary)*

In addition to their intergenerational network of family and friends, socializers also tend to be deeply embedded in their community, with a particular focus on charity work, bettering their neighborhoods or places of living, and involvement in religious

activities. As a result of their involvement, their social circle often goes beyond friends and family members, to include community members as well. These community contacts are extremely diverse and tend to cross intergenerational, race/ethnicity, and gender boundaries. Since the socializer is generous with both her time and her concern, she is often the recipient of ICT gifts from church and charitable organizations:

*So I went into church the other day, and the pastor said to me, "Some people found out your digital camera was stolen and they wanted you to have this." He handed me a package and it had a digital camera in it. I couldn't believe it! Now I need to figure out whom to thank. (Gwen)*

Socializers tend to be the eagerest of all five of the types to adapt to "the young's way of doing things" (Mary), and therefore actively seek out new forms of ICTs. They often want to "have everything my grandkids have" (Gwen) as they view their adaptation as critical to their maintaining these relationships:

*I am the queen of texting. I have to text. I'm forced to do texting because some of my grandchildren just will not answer the telephone. They have their phones on vibrate so they just will not talk on the phone. So if I want to ever talk to them I have to text. I'm a great texter and I know all the abbreviations. I make some of them up myself and I have them ask me what they mean. "Huh you're a pretty smart old lady" they'll text me back. I make up my own text words. My son of course he's a sheriff and he's very busy so I'll text him real quick just "? R u kp" (Are you a cop?) or "?location" (Where are you). I don't know what they say or think about me doing all this texting, but I love to do it. And I have to do it. (Gwen)*

*Well if someone says there's a picture of so and so on Facebook actually we jump on and just check it out. We take what we get, whatever is there is what we enjoy. We have found with Facebook though it's been a huge difference in our lives because we do not get information directly even from our children. They forget to tell us because they assume that we have read it on Facebook. But we take what we can get- it's the young's way of doing things. We see this technology thing through old eyes. (Mary)*

Socializers tend to be active seekers of new devices. Although they often are not the purchasers of such devices themselves, they are constantly interested in and ask that their contacts show them their latest devices, and how they are using them:

*I want whatever the grandkids have... My daughter had an iPad the other day. She showed me her daughters' gymnastics performance on it. I asked her "show me how to use it." I was a bit afraid at first, but she said you just touch it like this. Now I want one. (Gwen)*

For the socializer, the most important life contexts that introduce them to ICTs are community, family, and leisure connections. Traditionalists also tend to be introduced to new forms of ICTs through their family relationships, although the results of such introductions are quite different.

#### *Introduction for the Traditionalists*

Traditionalists have a strong preference for doing things "the old way." In the case of the Lucky Few Birth Cohort, this means using the landline over the cell phone, using the TV over the internet for entertainment, and using the radio over an MP3 player. One of the traditionalists was first exposed to computerized technology through work (June) while the second traditionalist had stayed at home with her children and later was a housewife (Mindy Jean). While traditionalists will often list the pros of older forms of ICTs (particularly those forms that they used in early adulthood) they are not opposed morally to newer forms of ICTs. This means that they will try new forms of ICTs, including computers, cell phones, and even software like Facebook, but often their use is not established and these devices come to occupy a desk drawer or gather dust:

*One of my sons is going to come up and set up email for me. I'll try anything, so they come up and set it up I'll try it with them. It's not anything I really desire. I'm not fighting for it. I'll try it- that's it. (June)*

*I'll try the computer. But I'm not really that interested in it. (Mindy Jean)*

Both traditionalists in this study were retired or had chosen to stay at home. For the traditionalist, the current means of introduction to new forms of ICTs typically as gifts from their well-meaning children and other family members:

*My daughter bought me a cell phone when they first came out. I don't even know when that was, but I didn't know how to work the cell phone. I charged it so much the cell phone burnt out in the first month because I didn't know what I was doing. She said, "I'm not buying you another cell phone." She bought a good one and I didn't know how to use it. Then I got one of these that we call the Obama phone, an Assurance phone, so with that I've been much more careful. My girlfriend moved to Texas and she gave me this other phone because she said she wanted me to forever keep in contact with her. But I don't use them. I use my landline. (June)*

*I have a notebook computer I got last year for Christmas from George [my husband]. My son set me up and he said he was going to help me learn how to use it. That never happened. My daughter has helped me a little bit and gave me some directions on how to use it and then when I did the directions something else appeared on the screen. I could never get past that point and then when she explained it she went so fast. I needed a little more time. (Mindy Jean)*

Many traditionalists commented on how, while they appreciated the gifts from family members, they often felt frustrated by the fact that family members insisted they use these devices. In many cases, they felt that their family members couldn't understand how they could be happy using the "old" methods:

*I'm not against future things. Like my son said to me over the weekend, he said "how's your computer coming?" I said "It's alright." He said "Mom you got to really pay attention." I said "Thomas, if I'm going to call somebody I'm going to communicate with someone, I would prefer to call them on the phone and listen to their voice." I mean sometimes you can pick up things quicker than if you're going to type it out and then wait for a response, at least you'd be there in time if your friend needed you right away. I have a friend with depression. If she sounds depressed, I can say "Let's go for a walk. Let's get out of the house." You don't get that from an email. Email is good for some stuff, not for me. My son doesn't get that. How can you not get that? (Mindy Jean)*

Unlike the common conception about individuals who do not use more “modern” forms of technologies (such as cell phones and computers) in the literature (Paul & Stegbauer, 2005), traditionalists are very aware of new forms of ICTs. While their knowledge is certainly not cutting edge as the enthusiasts, they understand various new forms of ICTs, such as Facebook and Twitter. While this exposure was sometimes through their family’s purchase of such devices, much of their knowledge came from the traditional forms of media that these individuals watched religiously. All of the traditionalists mentioned tweeting, stating that they had heard about it on the news or mentioned in talk shows (and sometimes even in soap operas). Although they did not understand the specific details of newer ICTs, they understood enough about them to be well aware of what was available and why these newer ICTs did not interest them:

*If you say something to a friend in confidence and you say that’s between you and I and your friend keeps it between you both. If you put it down on in a computer and e-mail or Facebook it’s not always between you and I anymore. It can leak out in ways I guess- it gets passed on or forwarded and sometimes this is even by mistake. They had that on the TV the other night. And there’s bullying that happens. That’s why I don’t want Facebook, I don’t want to miss the actual interaction with my kids and grandkids and I don’t want to participate in something that can hurt people. I know that other people love it and use it, but it’s not for me.*  
(Mindy Jean)

Mindy Jean expresses that she not only understands the plethora of ICTs that exist, such as email and Facebook, but that she understands the basic premise of the how the technology works and why it is not for her. This viewpoint is quite different from the Guardians, who tend to have a much more negative view of how ICTs are used, despite using more modern forms of ICTs.

*Introduction for the Guardians*

For the guardian, ICTs when misused (which is highly likely given people's inherent traits according to Guardians) bring out negative behaviors that threaten our society. While the Guardian perspective could be mistaken as "negative" towards ICTs, this perspective focuses more on their misuse than any other aspect. Therefore, it is not necessarily an ICT which causes negative behaviors, but misuse of the ICT by individuals or corporations that make the ICT "bad" for society. ICTs are simply channels which can enable good or enable evil. Unfortunately, most of what the Guardian sees as far as ICT use are negative examples.

Guardians, like all the other types, were typically introduced to older forms of ICTs in their childhood. Their childhood experiences with television, movies, radio, and the telephone tended to be overwhelmingly positive. Guardians tend to remember their childhood experiences with nostalgia, and in some cases, they are among their fondest memories, such as in Margaret's case:

*Back then we watched TV as a family. We sat down after supper with a bowl of popcorn and you watched TV. I can remember long before we had a TV, we used to go to the movies. And we had a little movie theater that was within walking distance of our house and my mother loved movies. And so, many a night after dinner, we would go to the movies. We'd go to the movie as a family. Then on Saturdays, as long as we had our chores so to speak done, as long as our rooms were picked up and we had helped mom do whatever we were supposed to do, Saturday afternoons was the movies. And it was a social thing. Everybody was at the movies on Saturday afternoon. It was where you met up with all the kids that you went to school with, and it was a social thing. (Margaret)*

However, these experiences often stand in strict contrast with their later experiences with ICTs, such as Margaret's description of her view of current television and movies:

*I think the TV now, at least my experience with TV; even back when I still watched it once in a while, it was more like you're doing your own thing. It wasn't a social thing anymore. It's isolating. The television has sucked people into thinking they need, I need this, I need that. It's become more and more "let's get our Christmas shopping done in September!" Let's almost forget about Thanksgiving, that Thanksgiving even exists anymore. Other than it's Black Friday, the day after Thanksgiving. Let's just run out and buy a whole bunch of stuff that nobody needs. "Oh I want that." "Where can I get one of those?" What for? TV glamorizes everything: violence, waste, excess. (Margaret)*

Some Guardians were exposed to ICTs in their work, as certainly was the case with Jackie and Margaret, however, these experiences tended to be negative. Often for Guardians, they experienced a major negative event following the introduction of an ICT into their workplace or family, something which will be discussed extensively later in this chapter:

*When I left work I had a computer on my desk. Everybody had a computer on their desk. When I first went to work there in 1980 the computers that we had were the computers where you only had incoming information. I don't know how to explain it any other way. But we had no input. It was information that came to us. Most of us in the office when we got "the new computers" were panic stricken. (Margaret)*

In the case of Natalie, she was not formally exposed to the computer in her work as she co-owned a microbiological testing company with her former husband. Since she was a relatively high level employee, and computers were seen as low-level secretarial work, she was not motivated to learn: "I had my secretary do it. We had a secretary- that was what she was there for. I didn't need to know what she did- we could hire it."

However, when Natalie's marriage began to sour and she suspected her husband of cheating the business, she felt that she must learn to save the business and her reputation. With the help of her cousin, she learned to use the computer and eventually install a key tracker on her husband's work computer. In addition to confirming her

suspicious about her husband cheating the business, she also found out that he was romantically and sexually involved with other women:

*I didn't use a computer until 1999, when I wanted to find out if my husband was cheating the business and if he was cheating on me. So my cousin would talk to me over the phone: "Now you do that, now you do that." I was scared to death of breaking the thing. It was a step by step by step by step thing. Because I couldn't just jump in and start clicking on stuff! Installing the tracking software gave me some confidence! I got some experience. I was forced to do things. I went into hackers chat rooms looking for a key stroke tracking program. I called one kid - he was a college student. He had a key stroke tracking program out there. I downloaded it but I couldn't use it, because you had to know how to use a computer. So I called him after I asked him for his phone number. I said, "I couldn't install your program I'm not - I'm not computer literate - I'm a housewife. I'm not a computer operator" so he put together a program that was simple. And it did its own thing. Just for someone who didn't know how to run a computer. I used that and it worked. That's how I found out that my husband had a girlfriend- he emailed her so I wouldn't know. (Natalie)*

As a result of this negative experience, guardians tend to be most cautious about adopting new ICTs. Most of their ICTs are gifts from family and friends. While some of these gifts are celebrated, Guardians are often given gifts (or have gifts suggested to them) that do not fit their criteria of being good for society:

*Actually the only reason why I had a cell phone when I retired is that people at work asked my kids "What could we get her?" Could they get me a computer? My daughter said "no, no, no. No don't get her computer. She won't use it. Get her cell phone. If you have any money left over, get her a nice phone, and just pay part of the plan." (Margaret)*

*My husband knew I always wanted an Apple computer because I heard if you're into photography or any of the arts that's the computer to use. Now I had never used it or knew anything about it. I just had too many people tell me that was user-friendly and I hated Microsoft. Quite frankly, I hated it. It used to do whatever it felt like doing not what I felt like doing. But I love my Apple! It was a wonderful gift! (Jackie)*

ICTs they view as overwhelmingly being bad for society are often rejected. For the participants in this study, videogames were the only ICT that was seen as

overwhelmingly negative (something that will be discussed in the meaning section of this chapter) and out rightly rejected. However, many ICTs occupied a middle ground: if the individual did not become too engrossed and drawn into the device, lose basic manners, and was able to maintain a balanced life, the ICT was seen as potentially good for the individual within these confines of acceptable use, and therefore used by the guardian. All guardians in the study discussed their use as being “good” and resisting the temptation to use an ICT in an inappropriate manner.

The next section focuses on how these five user types differ in their use of ICTs in their everyday lives.

#### *Use of ICTs*

Domestication theory suggests that once an ICT is introduced, that ICT becomes embedded in the larger routines and norms of the household. This was strongly supported by this study, as was previous research that suggested that new ICTs do not necessarily replace old ICTs, but rather change their use patterns. Therefore, old ICTs are not necessarily cast aside, but their use changes and adapts to integrate the new ICTs into their lives (Silverstone, et al., 1994).

Each of the user types in the study had a predominant use pattern and view of similar ICTs for each life context. For instance, the cell phone is used by enthusiasts across every context, by the practicalist mostly for work and family, by the socializer for family, leisure, and community use, by the traditionalist as an emergency only device for family members, and by the guardian for strict purposes in family, work, and community applications. These different use patterns reflect the meanings that these ICTs have to

each of these types. For each of these types, ICTs have a distinct meaning, and this view of the purpose and best use of an ICT impacts what contexts an individual uses an ICT in. The following subsections discuss how the use of ICTs is different for each of the types.

### *Enthusiasts' Use of ICTs*

Enthusiasts have integrated ICTs into every task of their everyday lives. ICTs are fun and exciting, and from the enthusiast's perspective, why not have more fun when doing everyday tasks? Enthusiasts were the most likely of any of the types to use a plethora of ICTs widely in each area of their lives, including in their family, leisure, work, and community lives. For instance, it is not uncommon to have an enthusiast who reports using their cell phone or smartphone across their family, work, leisure, and community lives, often extensively. For instance, Alice discussed her use of the smartphone in work. Alice had originally bought her smartphone for personal use, but quickly stretched her use of the phone into her work in novel ways:

*My smartphone is amazing. I'm always using it for the Internet. It's got really neat games! I'm a game person. But I use it in other areas of my life too. I was doing a temporary nursing case with a woman. Among other things I had to take her vital signs every day. I got there one day and darn it if my watch battery hadn't stopped. I just very quickly got on the smartphone, downloaded an app for an analog watch, turned it on, and there I was able to take the vitals and I was done! But I use it in other ways too. I started taking a couple pictures and showing them to one young patient and the next thing I knew she was picking up the phone on her own and looking for them. I'm always taking pictures and printing them out for her. I take the pictures on my phone because she can use my iPhone. She's got the mentality of a pre-kindergartner or maybe 1<sup>st</sup> grader but she uses the iPhone... it's been a great use of my iPhone. So I take pictures of situations that make her uncomfortable. For example, she does not like the dentist. Her father has this habit of not telling her what's going on just saying "get in the car we're going for a ride," and it could turn out to be something fun like going to the mall or could be going to the dentist. I don't think that's fair so I will tell her in advance this is what we're going to do. So if I have pictures of it it's much better, so the last time at the dentist I took pictures of her in the dental chair and they gave her a latex glove that*

*she loves. So now she goes to those pictures all the time and she looks at them and says, "Glove, Dr. Nolan." So that's a good prep for her, I do that on a lot of different things with her. (Alice)*

As can be seen from Alice's example, enthusiasts not only use their ICTs across the many areas of their lives, but they also bring ICTs into new areas of their lives. Alice uses her Smartphone in her work in a unique way: to help her patients to understand their experiences.

The enthusiast "plays" with their new device (and even their current devices), constantly looking for ways to stretch and use the device in different areas of their lives. As can be seen in the example above, the enthusiast often takes a new device and quickly assimilates it into his or her life and uses it across all of the contexts. Both Fred and Harry spoke about their efforts to use ICTs in different areas of their lives, with a particular focus on broadening and stretching these ICTs from one context into the other contexts of their lives. In both cases, when these men began to speak about how they used a single ICT, they often spoke for 5 or 10 minutes at length on a single device and how they used it across the various aspects of their lives:

*I use my computer all the time. I now have four computers, I have my base computer which is my big desktop and then I have two laptops, three laptops. Well two laptops and a Smartphone, which I consider a computer. I use them to do things. I do an awful lot of image processing, web searching, research, etc., etc. I use them for teaching and presenting, they're just a part and parcel. I have a projector when I'm talking somewhere that does not provide a projector. I use my computers to produce things for teaching classes. I use my computer for producing things, for putting talks together, teaching, for making little teaching units. I am just now dipping my toe into the not podcasting but learning how to actually put good audio on my computer via microphone and using a little mixer and whatever. I use it for entertainment; a lot of what I look at on my computer is strictly entertainment. I start my day, by reading Arts and Letters Daily, Salon, Slate, New York Times, Wall Street Journal, just to get myself into what's happening during the day. I'm not a gamer but I have wasted many an hour playing Doom or solitaire. Once I started playing seriously with Photoshop*

*I found I had barely scratched the surface. There are many websites that have wonderful lessons on Photoshop. I guess the one thing I haven't talked about yet but obviously the computer is wonderful for e-mailing people, communicating with other people. (Fred)*

Enthusiasts are often the “technical help” individuals in their family. They are the individuals that others tend to rely on for technical recommendations and support. This is a role that most enthusiasts actively embrace, as providing this “help” is a way for them to share their love of ICTs, something which Harry spoke about:

*Patty (coworker, friend) thinks I should know all the technical answers if she has a technical problem and if there's some issue with like a website or something she'll call and ask me. I mean her expectations are that I know about computer hardware and computer technology, which is pretty much everyone's expectation. (Harry)*

Harry's daughter also spoke about how being able to talk with her father about technical things had brought the two of them closer together:

*I think technology has definitely allowed me to have a relationship with my dad that I might not have had otherwise. I think the fact that he is aware of all of the information technology that's out there gives us something else to talk about and some common ground. So he talks about new cell phones, and I've shown him my computer. For my job I edit on a computer. I edit video a lot. He has started to do that and while to learn how or have suggestions for me and so we talk about that a lot. I call him for questions more than not. He's sort of known as like the computer guy for the family. Anyone: my brother, my sisters, my aunts and uncles, they all call my dad for computer problems or computer suggestions. There is always one in every family, a technical support person, but it's not usually the oldest person. (Katrina about Harry)*

For the enthusiast, using ICTs (particularly newer forms) is not just something that they seek to do across various aspects of their lives, but they find that talking about ICTs and sharing their love of ICTs can strengthen their relationships with others. While the enthusiast seeks to find ways to use their ICTs in each area of their lives, this use pattern is quite different from the other types.

### *Practicalists' Use of ICTs*

While enthusiasts tend to have high skill levels, practicalists skill levels tend to be more diverse, with some practicalists having medium to high levels of skill, depending upon if they believe a device is a useful tool and the purposes they have used the “tool” for. Since practicalists see ICTs as tools for specific purposes, they tend to see each individual ICT as having a practical purpose in limited areas of their lives. For instance, a practicalist is much more likely to indicate that an ICT is specifically only used in the family or leisure context. ICTs are seen as life context-specific by the practicalist. Television, for instance, tends to be a leisure activity for practicalists, something which they watch with family members. Cell phones tend to be for work and/or family; while office applications are for work or maintaining the household:

*Primarily I would say the computer is for business, business records and research and things. There is some personal use; I've got a couple games on there I play. I look at the news and the weather, but mostly its business that's in there. (Boris)*

*Email is for friends, maybe jokes, it can be to schedule a meeting, or let's get together at so and so's or we'll meet for a beer, we'll go watch the game on TV. For scheduling social events instead of making a phone call sometimes it's easier just to send an email. So it's at the time whatever is convenient you know. Certain friends I'll call them on the phone or others I'll communicate with when they're on email. Different applications, different situations, different tools. (George)*

*I'm a learner. When you're talking about social tools and web based presentation things and a lot of the new applications I am fledgling. I push myself to use them. There are two ways I think about using them in my work. One is for my own personal work communication uses. I'm still finding a comfort zone with that because I'm not a real public person in a lot of things, and I prefer to write an article than to do a blog. So I prefer to have my thinking done rather than just lay it out there in process thinking. The second way that I think about the use of particularly the new tools and the new applications is in terms of student research. This second way is to figure out research products that allow students to communicate their research and what they have learned in innovative*

*ways. I think about tweets of George Washington before the battle of Valley Forge, or of all the soldiers on the night before the battle and how can kids capture the research they've done about what it would be like to be a soldier at that time. As a librarian, you collect those tweets to give an overall picture of what it was like to be in that situation the night before a huge battle. I always think about how it can be used by students and if I think it would be useful for me professionally. (Belinda on using ICTs for work)*

Practicalists do not tend to “stretch” their use of ICTs like enthusiasts. They are happy to have each ICT have its prescribed role and function, without seeking new ways to apply the tool into other areas of their lives. These ICTs are also seen as for the practicalist’s own use: something for their convenience and not for others:

*I have a cell phone; my theory is that cell phone is my phone. My children have said to me you didn't have your cell phone with you. The cell phone is not for them it's for me. (George)*

This finding was repeated throughout this study for practicalists, particularly when focusing on cell phones. Most of the practicalists maintained a separate landline, which was their primary form of real-time distance communication with others. Cell phones, because they were seen as tools for their own use, were frequently left off by the practicalist, unless they wanted to make an outgoing call:

*I'm not big on cell phones. It's the matter of necessity. I have one only in case I get stranded somewhere or had a problem. Half the time I don't even take it with me. I guess I keep it turned off because I've got a couple friends and their phone rang more times in the day than you could count. Half the day is shot because of the cell phone. It's like what did you do before you had a cell phone, somebody waited to talk to you. I don't want to be bothered on construction jobs. Half the time I couldn't hear the phone anyway because I'm using a piece of equipment, saw or sander, or router or something, I'd never hear the cell phone. I don't turn mine on unless I want to make a call. (Boris)*

*I normally keep my cell phone in the car. I think it frustrates other people sometimes because I don't hear it if it's in the car. In this house I always use the home phone, and so it doesn't bother me not to have the cell phone in here but it probably bothers a few other people. My wife says, “Why*

*don't you take the cell phone with you?" I forget to take the cell phone out of the car when I go someplace else. (Dan)*

As can be seen, every practicalist tended to view their cell phone in the much of the same way: a tool for their own use- so much so that they only turned it on when they specifically needed to use it. This often caused conflict between the practicalist and family members or coworkers, who sought to contact their practicalist but found their cell phone was frequently turned off:

*Yeah, well when Dad [Boris] first got the cell phone I would try calling it a few times but then I would get him at home and he'd say "oh I didn't take it with me today." So 95% of the time he doesn't have it with him, so I don't even bother calling it anymore, I just wait until the afternoon when I know he's going to be home. I get home from work and then I call him. Sometimes he'll call my phone and leave a message and then I'll just call him back. (Erica on her father Boris)*

*Belinda does not text at all. Do not text her. If you need to call her on her cell phone, you have to ask her to turn it on; she has to plan it to receive your phone calls. I keep explaining this because is not transparent to Belinda. I keep teasing her, I said "why don't you text and I'll text you and you can receive it and then you'll know I'm calling you." She just gives me one of her looks. (Peggy on her friend Belinda)*

The practicalist tends to apply this view of ICTs being context and purpose specific to all ICTs. Although some ICTs may cross boundaries (for instance, Jack paid both his household bills online and supported local community organizations financially online), the number of contexts each ICT is involved in is limited and specific. More importantly, the use is seen as being specifically falling into one of the life contexts: family, work, community, or leisure. This usage pattern is quite different from the socializers, who seek to use ICTs across their community, family, and leisure lives.

*Socializers' Use of ICTs*

Socializers prefer ICTs that allow them to connect to others. ICTs which allow connections to be made and maintained, such as cell phones, Facebook, computers, email, etc. are highly valued. These are the ICTs which socializers use nearly constantly. It was unusual to conduct an interview with a socializer without the interview being frequently interrupted, often multiple times, either by cell phones or landlines ringing, text messages coming in, or people knocking at the socializer's door. Even if the cell phone was turned off and the landline taken off the hook, individuals would stop by the socializer's home during the interview because the socializer could not be reached for a few hours. When these devices were turned back on, it was not unusual for the cell phone or landline to immediately begin ringing, or for a participant to have upwards of 5 to 10 messages left during the 3 hour time span.

The socializer views ICTs as essentially connectors- things that allow them to be socially involved with their family, friends, and community members. They tend to have little use for ICTs which they view as being non-social. Since the socializer is so focused on communicating and being in touch with others, they tend to use ICTs most often in the contexts of family, leisure (mostly communicating with friends), and community, as all three socializers in the study indicated. For Gwen, who was deeply involved in her community (the apartment complex where she lived had a high portion of individuals who received Section 8 housing waivers), all of her technology was for maintaining contact and helping her community and family:

*My cell phones I must have. That's a must. I must stay in touch with my family and my neighbors. So my digital camera of course would be just for things happening here in the community and with neighbors, with the children. Sometimes not so nice things that happened in the neighborhood*

*when the bad guys were out there and I take their picture. Sometimes I need to call neighbors and they have to call me or they need to use the cell phone, or I need to call on my community for help. If there's for instance a birthday that one of us is put on the morning news, or someone in the neighborhood, a school age kid or a parent and there's an event, I watch it on TV. Or if someone has been in an accident and we want to hear about it on the TV. The focus is in what is happening in the community. Microsoft Word I use with writing. I send out poetry to people in the community. Facebook I use to just send messages and having fun in the community and among my family. I text my neighbors quite a bit and they text me. I use the tape recorder in the community for documentation, mainly different things and dates. Making sure dates are right when something bad happens and getting people's name and events, things that have happened for record keeping. (Gwen)*

Although most of what happened in Gwen's community was good, sometimes there were incidents of child abuse, domestic violence, drug abuse, and criminal activity that she became involved in as not only a neighbor and friend, but also as a concerned citizen calling the police and trying to protect her community. She also used her ICTs to be aware of individuals who needed extra food (she kept a well-stocked food pantry which her church helped her to stock) or other forms of help. Mary was also very involved her religious community, using many different forms of ICTs to connect herself to others but also to stay informed of important events and news:

*I'm on the telephone with shut-ins and I e-mail our lost boy Donny. We're very pro-life and we're very concerned with all these issues that are going on. I'm always on the computer getting information on all kinds of activities. I have what I call a black book which I've had for probably since 1999, since I got the computer. It's full of things that's developed in the news and it was on all issues of concern that I had. One of the first things I out in there was when Dolly was cloned. It was in the newspaper and it was this little article and I cut it out and I showed everybody... I often share things I've kept in my black book with the members of the community. (Mary)*

The socializer tends to not use ICTs they view as isolating, and instead tend to use all their devices to promote, build, and maintain relationships among themselves and others. For instance, Nancy used her television extensively for three socializing purposes: to learn about things or watch shows which she discussed with family members or friends, to watch the television in a group setting, and also to learn about volunteering opportunities in her community:

*I like certain things on the television about India and they have specials on every once in a while. I like the specials that they have. My daughter was calling me and telling me about something that she had seen on the History channel. Lots of times I'll talk and share what I've seen with my daughter Bette and my friend Danielle. I try to get people to watch TV together in the main recreation room. Danielle and her family donated that TV. I also find out about what my community needs on the TV... I had seen it on TV that they had a lot of things for needy children for Christmas on the news. But they didn't have anything for young girls, so I had the chance to make a lot of hand crocheted pocketbooks. I made a small purse to go inside and I think there was about 40 or some odd and I sent them in and they had them on the news. I will be doing that again. I saw in the newspaper last year that they needed helmet liners for the troops in Iraq. So I told another lady here and she was helping me and we sent close to 300 liners overseas. (Nancy)*

Nancy's use of the television reflects many of the socializers in the study: they had no use of the television unless they were watching it for a social purpose- one which allowed them to build and maintain their relationships or to be better community members. Gwen found little use for her TV, unless she had her grandchildren over:

*I'm not much of a TV watcher. Sometimes I think I have the TV on maybe just for the noise or I think you're supposed to turn the TV on once in a while or whatever. I don't sit still long enough to watch TV. So I like to use it for the grandkids. So when they come... I'm not interested in that stuff by myself. When they first came out with the TV I remember the living room was like the family place, you know, so nobody was shut off from one another. I mean mom and dad and the rest of the family watched the same thing. It was social. Kids today they have TV's in their own room and whatever. I would never have a TV in a bedroom. (Gwen)*

Nancy also used gaming to build community at her assisted living center, another example of how a potentially isolating ICT (such as gaming devices) can be used by a socializer to promote feelings of community:

*Well we have televisions on all the floors. If somebody is in their room too much, getting too isolated or depressed, I try to get them to come to things we do here that other people like. Bingo is a big thing, and the Wii is a big thing. They have a bowling tournament on the Wii. I like to get other people involved in it. I like for other people to get involved in it. (Nancy)*

Nancy's use of the TV and videogames emphasizes that the importance of the ICT to a socializer is not embedded in the ICT itself, but whether the socializer can use the ICT to connect with others.

For socializers, much of their ICT use is actually heavily influenced by individuals within their social network. This means that what the socializer uses is not heavily influenced by the media or even what is available, but more by what individuals around them are using. This means that a socializer's plethora of ICT use closely mirrors those in their social circles. Therefore, if their intergenerational contacts are "into" using a certain device, they use it. If their intergenerational contacts are not using a certain device, the socializer is very unlikely to show interest in the device, use it, and is unlikely to even have been exposed to it, precisely because her network contacts do not.

As a result of the heavy influence of social contacts on the socializer's use, this means that some socializers use a large number of ICTs, while others use less. One poignant example of this was Nancy. Nancy's social network was composed primarily of three sets of individuals: close family (including her biological and adopted children), close friends (whom she considered family), and fellow residents (neighbors) at the assisted living center. Although many of these contacts were intergenerational, her use of

ICTs were most influenced by those she was close to and had a lot of contact with: mainly her fellow residents, a few close family members, and a close personal friend. Since the most commonly used mode of communication for these individuals was primarily the phone, Nancy used the phone extensively in her socialization. Although many of the other individuals she interacted with used computers (sometimes extensively in the case of close family members) they showed little interest in interacting with Nancy through email, Facebook, or other electronic means. Therefore, although Nancy was a socializer, she did not use the computer because the majority of her social network (largely made up of fellow residents and nursing staff) did not use the computer to communicate.

For the socializer, her use of ICTs are for social purposes in social contexts—mainly those of family, leisure, and community. Of all of the types, the socializer is the most involved in her community and is the most likely to bring ICTs (both older and newer forms of ICTs) into her community life. This is in contrast to the traditionalist, who views newer and older forms of ICTs quite differently and resists using newer forms of ICTs.

#### *Traditionalists' Use of ICTs*

Traditionalists rely heavily on what could be considered “traditional” or older forms of ICTs. They are extremely heavy users and consumers of those forms of ICTs that were common when they were children, including the landline phone, television, and radio. They tend to use these ICTs heavily across almost all areas of their lives, including family, work, leisure, and community. The traditionalist loves these older forms of ICTs, and uses them frequently across all of the contexts of their lives. It is not uncommon for

the traditionalist to have the television and/or radio on when I visited them for their interviews, and they often shared their love for television, radio, and the landline phone in their interviews:

*I love my radio. I like soft rock. I like the older tunes too. I like the up-to-date songs that some of them play. I don't like any of the rap or anything else like that, that's not my bag. CD players, or my player, I play that, I play my discs. I just like music. I used to listen to soap operas on the radio as a kid when I was home sick from school I'd listen to all the soap operas. "Guiding Light" I used to listen to, "As the World Turns" I think that was on, there was another one, I can't remember what the other one was. Oh I just listened to them all, I remember listening to them. I used to watch them on television too- until they got canceled. Now I watch "The Young and the Restless." I didn't always sit down and watch TV, my soap operas, like just sit there and constantly watch. When I was taking care of children in my home and they were napping, I would sit down that hour and watch that soap opera because it would give me a chance to get refortified, cause I had busy kids... I mean I wasn't a fanatic but they came on at different times that I had a chance to sit down or if I was busy in the kitchen I'd have the TV on... if I don't have the TV on I have the radio on. I play the radio when I have friends over, when I do housework, or really anything. (Mindy Jean)*

What makes a traditionalists use different than the other types is that they tend to differentiate between newer and older forms of ICTs. Whereas older forms are well integrated across their various life contexts, the traditionalist tends to not use newer forms of ICTs, and if they do, use them in extremely limited ways within each life context. For instance, Mindy Jean tended to use her cell phone only within the family context, and only for emergency use:

*I'm not that interested in using my cell phone, let's put it that way. Right now I'm able to communicate and find things out my normal way by using the landline. When I can't do that anymore and then I'm really going to have to check things out a little more seriously. But I don't know if that's going to come in my day and age. Probably I will need to learn. My kids had to call me when I got home in the old days; I never had an answering machine. If a person wanted you enough they'd keep calling until they got you. Now with the cell phone you can get in contact with them right away. Well I wasn't too interested in carrying a cell phone and I don't*

*necessarily always have it on and that drives certain people crazy. Because like I said it's for my use. I really don't want everybody calling me on it. Only my family has my cell phone number. They all think I'm a little crazy, but I already have a phone. (Mindy Jean)*

While Mindy Jean chose to only give her cell phone number out to close family and only used it in emergencies, her use of the traditional form of distance voice communication, the landline telephone, was very extensive:

*I used to call my mom every day when she wasn't living here. I call my daughter pretty much every day or twice a day. I like to chat on the phone. I have a few people I like to call... The land line is the phone number that we normally give out to anybody. The cell phone numbers we kind of keep to ourselves. You don't want everybody in the world to know your cell phone. Our land line that's the phone that we give out on applications or in doctor's offices and so on, so we do get reminded of our doctor appointments and stuff like that. We use the landline to call out most of the time for doctor appointments or we use it for our friends. I'm more in contact with friends through the landline than my cell. My cell is for emergencies. (Mindy Jean)*

June also provided a separate example of how traditionalists tend to limit their use of ICTs within a single context with her use of Facebook. June had a Facebook account that had been set up by one of her daughters. Her daughter only “friended” June’s family members (as opposed to also “friending” friends or former coworkers, etc.) at June’s request. June only visited Facebook when she was told to do so on the phone, and saw Facebook as being a “family” thing rather than a “leisure” (or fun) thing to do:

*My family sends me a message. They'll call me and say, "Go on Facebook. I just put something on there for you" and that's when I go in and look for the message. I only use it for family. And I only go there when I'm told that there is something there for me. I don't get why they just don't tell me what it is on the phone. I mean, they're already talking to me! (June)*

Often traditionalists would mention the fact that they did not need to use newer forms of ICTs. Not only were they happy with what they had (and couldn't see

themselves as being happier with newer forms of ICTs) but if they needed information off a newer ICT form, they had family members who would accommodate their needs:

*If I really need something off the internet, someone will find it for me. That's why I have kids. And if my kids won't do it there's a man who works at the front desk who's into this whole technology thing and he'll do it for me. (June)*

*The computer is really my husband's thing. If I really needed to do something online, he could do it for me. (Mindy Jean)*

*I see the computer as my thing- as my responsibility. Using the computer is my duty. If Mindy Jean needs something, I do it for her. Online shopping, finding out the weather, all those things I can do for her, so she doesn't need to bother trying. (George on Mindy Jean's computer use)*

Both Mindy Jean and June provide examples of how traditionalists tend to have two distinct use patterns: extensive use of older forms of ICTs across several life contexts and limited use of newer forms of ICTs within specific contexts. In addition, their use pattern tends to be supported by family members and friends who help them to accomplish tasks or garner information from the internet. This is quite different from the guardians who tend to view ICTs not in terms of being old or new, but in terms of negative impacts on society.

#### *Guardians' Use of ICTs*

Guardians are very conscious of having a good mix of both ICT use and face-to-face time. Of all of the types, only Guardians made a point of specifying that they balanced ICT use with visiting with and meeting people face-to-face, a goal that they believed every individual should have:

*Technology is often easier than spending time with someone in person. You don't have to put up with bad characteristics and bad habits. I work at having face to face time. I make sure I see all my friends face-to-face, I don't just live in the virtual world. (Natalie)*

*I prefer to meet people face to face. I preferred to meet you (the researcher) face to face. I can judge people better face to face than over the phone or online. You're a real person. I'd much prefer to spend a half an hour with a friend and see them than spend an hour with them on the phone. (Jackie)*

For the Guardian, all ICTs tend to be limited to one or two contexts. For instance, most guardians had a specific reason why they owned a cell phone: for family and/or for emergencies, and for speaking with friends when out of town:

*I think the cell phone is a great thing. Especially in the case of emergency when you have to get a hold of somebody. It leaves you free to perform some task without having to worry about missing a phone call. It gives you little bit of freedom. (Natalie)*

*What is important to me is to check the news every single day. I don't have a TV and I don't ever intend to have another TV. Therefore, I need to know what's going on. I need to know what's going on in this world as far as news. That is important to me. I feel like I'm lost when I don't. So I use the computer for my news. News and I do my e-mails. I check those during the day. That's important to me because that's one of my primary ways of communication with the outside world from home, as I don't like to talk on the phone. I also use the computer to work with my pictures. It's all leisure stuff. (Jackie)*

What makes the guardian type different in their use than the practicalist is that the guardian tends to be concerned with becoming too absorbed in any type of ICT use, be it a newer ICT or one that had existed for decades, rather than viewing an ICT as for a specific use as a practicalist does. While the practicalist sees the television as a leisure and family device, the guardian sees the television as a device that “sucks” away time from actually spending time with family members or doing other worthwhile leisure activities. All the guardians were concerned with issues such as watching too much television, spending too much time on the phone, and texting too often. These tasks were seen as being done at the expense of other tasks that are considered more important:

forming relationships and learning important life lessons, particularly in the case of children:

*Cell phones can be as annoying as all hell because people don't use them as they should. People get those things stuck in their ear [blue tooth ear pieces] and they're talking with no notice of where they are. People have forgotten about courtesy. I was with a friend yesterday and she was texting. And of course the phone kept ringing, and she wouldn't turn it off because she's got family members that might be trying to get to her. So you couldn't even carry on a conversation. This thing kept making this noise- it got to be an annoyance. In church yesterday, two phones went off. There is a time and place for these things, and it isn't church. (Natalie)*

*I feel that in life to today there is a definite need for all this modern technology. There's a need for but I think it's just like many, many things it's overdone. "It's a beautiful day outside." I used to say that to my grandson when he used to come over. When he was 10, 11, 12 years old, I'd say "it's a beautiful day go on ride your bike. Go ride your bike go out and play. You're not going to sit in here and play that video game all day. If it's raining you can go play your videogame." But there are other things to do. Go out and look at the trees. I think it's absolutely mind-boggling ridiculous that cars now have TVs in them. Look out the window. Enjoy the view, see what you're seeing in the car. It's removing them from a part of life that I think is important. I think it's important to sit down and have a conversation with mom and dad. And talk to grandma and grandpa if you're lucky enough to have grandma and grandpa. (Margaret)*

Guardians themselves tend to view ICTs as context specific, but their use within that context is carefully self-monitored to ensure that it is not overwhelming other important activities:

*I'm not saying that you have to have your nose in a book all the time, but you don't have to have your nose in front of the computer all the time either. I believe a happy life is a life of moderation. Yes, use a computer, use a cell phone. The cell phones wonderful because you can be in the grocery store and realize that "oh gosh do I need that?" And you could call home and say "can you look in the cupboard and see if I need such and such or" or you can call somebody and say, "I'm running late. I got caught in traffic." But you go to the mall and you see people walking around and they're just talking on the cell phones. Talk, talk, and talk, on the cell phone. I thought you went to the mall to go shopping. So I think that people go overboard on all that stuff. (Margaret)*

In the case of some ICTs, which are seen as being overly negative influences on their lives, the guardian stops using the device altogether- something which Jackie decided to do with her television:

*Well, I used to have a TV. What I found was that we had two TVs. My husband had his and I had mine because we had different things that we wanted to watch. Again, I don't like wasting my time so why would I watch something that he wanted see but not I? So we had two, and I would watch my TV upstairs I went to bed, it was in the bedroom... After a while I found there was nothing I was interested in. All the shows are low quality and the news lies about everything. I won't have a liar in my home... Quite frankly I think society as a whole spends way too much time on TV. They should really turn the TV off and do other things. So when my husband passed I just didn't see any need for anymore. And I had stopped watching a lot of it. I'd go for walks with my dog. I'd read. I'd visit with friends. (Jackie)*

For the guardian, their own use is guarded and self-regulated. Of all of the types, their usage within each context tended to not be focused so much on the device and what it facilitated (as with the other types) but rather what misuse of the device could damage or destroy.

The next section of this chapter deals with how each of these five user types displays their ICTs in their home. Each of the user types has a distinct way of displaying ICTs in their home.

### *Display of ICTs*

Individuals display devices in a way that imparts meaning to the individual. This display can not only indicate the importance of a device and the meanings an individual associates with the device, but such display also indicates to the outside world meanings such as social status (Silverstone et al., 1994).

Among the Lucky Few participants, there were remarkable differences between each of the five user types' display of ICTs in this study. Each type had a different perspective on where ICTs "belonged" in the home, assigned different meanings to where they kept the ICTs, and the message they sought to send to others about the place of ICTs in their lives. As an observer, the differences in the types' displays were remarkable and easily spotted upon first entering the home.

The table below provides a brief overview of the display of each of the user types. The next subsections explore each use type's display in specific detail.

**Table 4.6 User Types Display of ICTs in their Home**

<b>User Type</b>	<b>Overall Description</b>	<b>First Impression on Entering Home</b>	<b>Space where ICTs are located</b>	<b>Meaning of Display</b>	<b>Message they want to send to others</b>
<b>Enthusiast</b>	ICTs overrun every space in the home; are the center of most rooms (the digital hearth)	ICTs are visible upon entry. Each room has some type of ICT.	Every room including kitchens, bedrooms, living rooms, and hallways. Occasionally multiple versions of the same ICT are owned to allow them to be located in each major living space.	Pride in displaying ICTs. ICTs must be within easy reach to facilitate their use.	I love my ICTs; I am knowledgeable about them, and I'm proud of them.
<b>Practicalist</b>	ICTs are visible and proudly displayed in rooms where they serve a purpose; some rooms are ICT specific	ICTs are visible only in rooms that are purposed for use. ICTs tend to not be in "formal spaces" such as entranceways or formal living rooms.	Rooms specified for certain activities; for instance offices for computers; living rooms for TVs and DVD players, etc.	ICTs should be displayed where they are likely to be used, as tools they should be displayed in appropriate work or entertainment spaces.	I am an effective ICT user, but they are for my use and convenience. I will not be bothered by ICTs when I am not interested in using them.
<b>Socializer</b>	ICTs are never far from the socializer. ICTs tend to be portable to allow constant access and communication	ICTs "follow" the individual-tend to be very portable and move with the individual throughout the day.	Communication ICTs are located wherever the individual is- with the person often toting ICTs around throughout the day if they change rooms. Non-social ICTs often gather dust.	ICTs are a main source of communication that must be accessible at all times	I am well connected, always in touch, and use my ICTs like younger people use ICTs.

User Type	Overall Description	First Impression on Entering Home	Space where ICTs are located	Meaning of Display	Message they want to send to others
Traditionalist	Traditional ICTs (TV, landline phone) are displayed in many rooms throughout the home. If computerized ICTs are owned they are placed in spare rooms or offices (if available)	Multiple televisions and landline telephones are located throughout the home and are difficult to miss.	Televisions, radios, and telephones are located in every room of the home: the living room, den, kitchen, and bedrooms. These ICTs are most often used and prominently displayed.	Older forms of ICTs are displayed with pride throughout the home; newer forms are often hidden (or lie forgotten about in a drawer).	I love my older forms of ICTs and am proud of them. I use them all the time. Newer ICTs I do not use.
Guardian	ICTs are hidden- either grouped in a separate room (often a spare room) or otherwise concealed.	Home appears ICT-free; only upon close inspection can an individual find any evidence of ICTs.	Office, study, or spare room is preferred; often separate from main living quarters if possible.	All ICTs are hidden. Individuals speak about where ICTs do not belong in a home. Pride in maintaining ICT-free spaces for other activities.	I live an ICT-free lifestyle. Those ICTs that I own are relinquished to the basement or a spare room.

### *Enthusiasts' Display of ICTs*

Enthusiasts love their ICTs. Since they often use multiple ICTs at the same time (such as watching TV while working on their laptop) and they often own multiples of each device, each room proudly displays their electronic devices. Enthusiasts tend not to see their display as being particularly noteworthy or special, but rather feel that they need to have their ICTs in every room. Alice had three computers in her home: a laptop, a desktop, and a notebook:

*So my computer upstairs is a desktop. The laptop here I use for e-mail and some things like slideshows and stuff like that. I have a little one that I've got in the kitchen and I use that when I travel and basically it's my cooking computer. I've got all my recipes on it, which is great. I call that my kitchen computer. (Alice)*

Alice's three computers are situated throughout her home, with a computer placed in every main room. Like most enthusiasts, her home is filled with ICTs. Upon entering the enthusiast's home, one can immediately spot that they are an enthusiast by the fact that a television, computer, or other ICT (and often all three) will be predominately displayed in the middle of whichever room you enter, as can be seen in the pictures of Alice's living room below:





**Figure 4.1 Alice's living room**

Upon entering Alice's home, several of her ICTs are displayed predominately. Her television, DVD player, and stereo are visible directly in front of the front door, as is her laptop, which sits aside a recliner to the right of the television. Besides ICTs being sprinkled throughout her home (the kitchen, living room, dining room, and office), they are also the first items one notices upon entering her home.

Enthusiasts do not believe in having ICT-free areas. The only areas I could find in these individuals' homes where ICTs were not located were the bathrooms, although there were some indications that enthusiasts may have used ICTs in the bathroom as well. As Alice relayed, "Before I got rid of my landlines because of the cost and just went to the cell phone, I had phones everywhere in the house. I even had one in the bathroom."

This suggests that Alice most likely uses her Smartphone in the bathroom, just as she once used her landline.

Enthusiasts tend to arrange their ICTs in a room as the “digital hearth” or focal point of the room. Upon entering the room, the furniture is arranged around the ICT (be it a television, computer, etc.) The ICT is often in the middle of the room, often nearly directly across from the entry into the room, such that it is the first item in the room an individual sees. Such is the case with Fred’s attic space:



**Figure 4.2 Fred's Attic Space**

In Fred's attic space, one enters the stairs towards the back of the attic. To the right is the desk with the laptop, towards the left is the desktop. Wherever one looks there

are ICTs: printers, cameras, shredders, hard drives, etc. This is Fred's command center, where he spends 90% of his time while home, even in the oppressive heat of the summer:

*If I had a bathroom I could spend all day up there. I've been thinking about putting one in. There's a sink and a refrigerator so I keep soda in there, but it's generally comfortable up there. Now come mid July and August even with the air conditioner, sometimes it isn't that great but it's livable. I just sit in my undershirt when it gets too hot. The air conditioner does the job and in front of it is a fan to blow the cool air around. So yeah it's livable up there and during the winter I actually have this heater thing, that's been an amazing. I just got it last winter. I'd use the space either way- too hot or too cold, but the reality is I'd be up there whether I had heat or cooling. But heating and cooling is nice to have. (Fred)*

Fred, as an enthusiast, loves using his ICTs so much that he spends most of his time in the space where he has displayed them, even when it is too hot and too cold- and he's attempted to modify the space to make it more comfortable during extreme temperatures.

The enthusiast is interested in sharing their love of ICTs with the wider world, and by displaying their ICTs so predominately, they are indicating the central space that ICTs hold in their lives. For the enthusiast, ICTs are one of the main focuses of their lives, and this is reflected in the placement of such ICTs in the focal points of every room in their homes. This display is quite different from the practicalists, who tend to view ICTs as for specific purposes and display them in specific areas.

#### *Practicalists' Display of ICTs*

Practicalists see their ICTs as they view any other tool around their home: something with a specified and delineated purpose; and therefore that tool has a specified and delineated space it should occupy. Just as a practicalist would not store their woodworking tools in the kitchen, they would not place a computer in their kitchen, but rather in a home office. Belinda, for instance, situated her computer, television, and

printer in her “back room” or “den” which she chose because it was in a beautiful location:

*I put my computer here because I love to look out; I love to have a backyard to look at. I spend all my life on my computer so I need it to be comfortable and facing out. It's convenient for me; this is sort of a base. I put the television in the room because that's kind of the den, that's where I would go to relax and the living room is more for entertaining people and conversation. Why would you have a television there? A television would interfere with the conversation. (Belinda)*



**Figure 4.3 Belinda's Home Office**

Upon entering a practicalist's home, one is often stuck by the fact that despite practicalists often owning many of the same ICTs that enthusiasts own, their arrangement is quite different. Practicalists will tend to have spaces without ICTs, such as sitting rooms or reading rooms, but they will also have designated spaces for ICTs as well. Belinda's quote above emphasizes that ICTs have their designated space; however, they

also have spaces that are for other purposes than ICT use. Practicalists often refer to these ICT designated spaces as the “ICT room,” with the ICT which occupies that room becoming the room’s name, for instance, “the computer room” or “the television room.” These are the areas in which practicalists undertake these activities, and therefore the room becomes named after the primary activity that occurs in that room- be it computer use, television use, etc. This reflects the practicalists’ view that the ICT is a tool, and a tool is used in a designated work space:

*We used to have the computer in the living room. The problem with that arrangement was we couldn't get a sofa and chair big enough out here. If you had more than one or two people you couldn't have a conversation because of the lack of seating. We decided that we're better off moving everything and bringing the computer out here. This is my office space. This is my business space. I just got everything to do with business pretty much right here so that I don't have to go anywhere. I keep my personal files in here but I also keep other stuff to do with the business here like printer paper, ink cartridges, whatever. This is where I do my business. We put the TV in the other room and that is our entertainment room.*  
(Boris)



**Figure 4.4 Boris's Home Office Space**



**Figure 4.5 Boris's Entertainment Room**

Since practicalists are often not overly excited about using cell phones (viewing them instead as solely for their own use), practicalists will often have multiple landline

phones, occasionally having landline phones in nearly every room of the house. For many practicalists' homes I interviewed in, landlines were present in every room except for the bathrooms. Boris, for instance, had a telephone in every room of his home. Despite the open nature of the A-frame home he lived in, a separate telephone was located in the kitchen, office area, and entertainment areas of the large open living space. This meant when a person called, at least 5 phones (including phones in the master and spare bedroom) could be heard simultaneously.

*Having phones everywhere in the house just makes it handy. Those phones from Radio Shack are \$20-25 and they're cordless and if I'm going to go out in the shed and work or puttering around outside I take that phone with me. If she gets a phone call upstairs and it's for me, and she calls me to the phone, I don't have to run upstairs. I can just come in the door downstairs and use that phone. (Boris)*

Belinda was actively trying to learn to use her smartphone, a purchase she had made for work. As part of her learning experience, she was trying to get better at leaving the cell phone on at all times and carrying it with her, rather than misplacing it/ finding it and just turning it on when she wanted to make a call. "I put it in my purse. I'm trying to get better at taking it with me. I always take my purse. If I forget it, I'm screwed."

The practicalist is interested in using and exploring ICTs which work for them. By displaying their ICTs in spaces where they are frequently used, the practicalist is ensuring that they have a space for that ICT's use. ICT use tends to be more fragmented in the practicalists' life than an enthusiast, as the practicalist is not surrounded by ICTs in every area of the home. Practicalists instead enter an area where they wish to use an ICT, use that ICT for the duration of that activity, and then typically exit the room.

*We put the computer in here because this is a good little work area to put a computer in, like an office. We have a TV for the grandkids to use in the front room, and this is the TV that my wife and I use when we are*

*downstairs in the living room. We didn't put the TV in the office because that is where the computer belongs. When we use the computer, we're in there. When we use the TV, we're out here. And if the kids are watching, they're watching a kid's program, so we don't watch that. They have their own TV for that. (Jack)*

Part of the practicalist's display of such ICTs is related to their sense of discipline; ICTs tend to be kept neat and orderly. Similarly, practicalists tend to approach their ICTs use as something which they must be disciplined in using. Most practicalists spoke about using ICTs in a disciplined and focused manner, reiterating how they were "just tools" and not something that individuals should be "sucked into."

*I think that the computer can lead you to waste time.... I keep the computer out in the office because it allows me to only use it when I want to- otherwise I can read or do something else. (Dan)*

However, unlike guardians, the concern for practicalists concerned their own use- not the use of others or general society. Their focus was on self-discipline, not on how ICTs activated traits in others. The practicalist's placement of ICTs in designated areas was quite different from the socializer, whose display focused on the mobility of the ICT being used.

#### *Socializers' Display of ICTs*

Socializers tend to prefer mobile ICTs which allow them to stay up to the minute with their large network. Often their homes look no different than a practicalist on first entry, except for when one closely observes their behavior. The socializer tends to move their ICTs with them. For instance, while most traditionalists kept their cell phones hidden, both the enthusiasts and the socializers kept their cell phones with them during the interview. This was definitely the case with both Gwen (who had to shut her cell phone off during the interview because of frequent calls) and Mary. The socializer is so

in the habit of taking her communication devices with her that that both of these women would even carry around their cell phones during the portion of the interview when we observed their display of ICTs in their home. It is important to keep their cell phones with them, so that they avoid missing important calls or texts:

*The cell phone I can walk around with. I'm not confined to sitting. I'm not just sitting while talking on the phone instead I can get a lot of things done. I can make my bed. I can do a lot of things, like hang out my clothes. I can do a lot of things, like go to my car. I spend so much time on the phone that if I couldn't get things done while on it I'd never have clean clothes or make my bed. (Gwen)*



**Figure 4.6 Gwen's cell phone is never far from her reach**

Gwen did not own a computer, but stated that she would prefer a laptop, and also had an interest in an iPad, primarily because of the portability of the two devices. Mary, whose family did own a laptop, had convinced her husband (Cleveland) to keep their laptop in the living room, rather than living it in the study (located in the basement).

Interestingly enough, on my visits to Mary and Cleveland's home, I noticed that Cleveland (a practicalist) frequently went to the basement office to work. Mary would make sure at the end of the session he brought the laptop back upstairs to facilitate her socialization. While Cleveland's tendency as a practicalist was to leave the laptop in a designated space (the office), Mary's tendency as a socializer was to move the laptop into her currently occupied space- the living room:

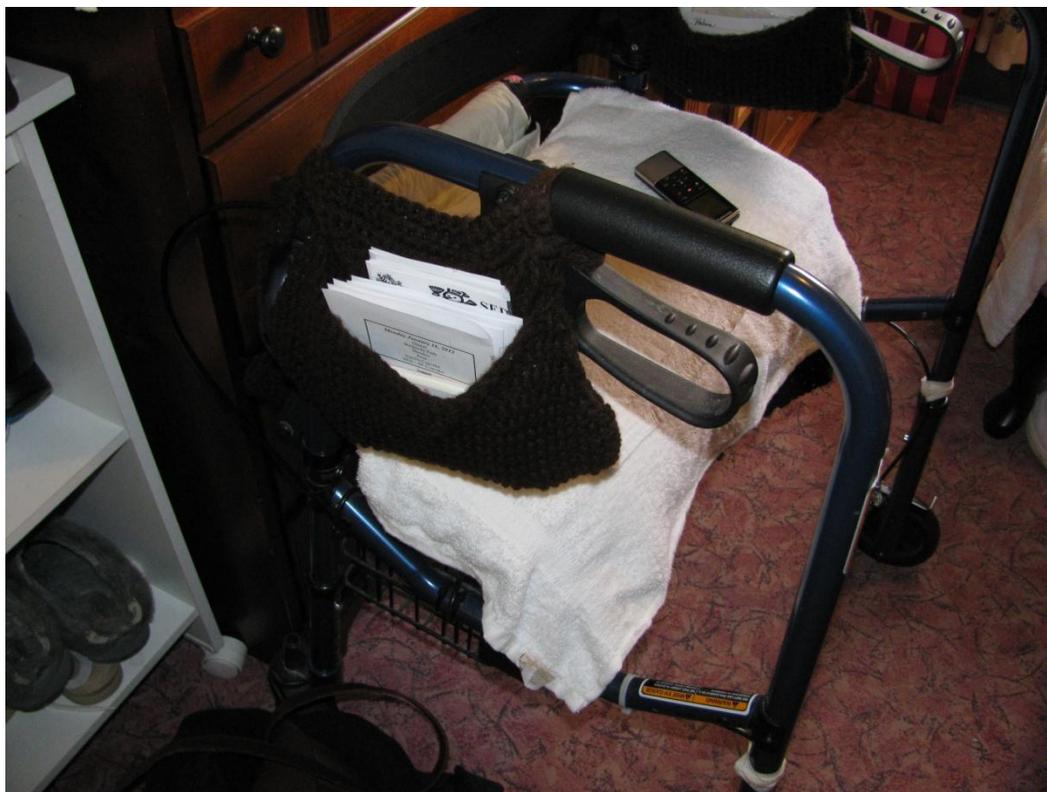
*I like to have the laptop up here, so I can just use it. We used to leave it downstairs, Cleveland likes to use it down there. But I don't see the point of leaving it down there. I like to check my email or Facebook when I feel like it and not having to go down to the basement. (Mary)*

In the case of Nancy, she was limited to more traditional forms of ICTs because of her arthritis and financial constraints. Because of this, most of her ICTs were located in her room (which was quite small due to it being in an assisted living center) but within easy reach. During our interviews we sat at the end of her bed, with her in a chair and me sitting on her walker. She often moved the phone closer to her during the interview, a habit she stated that she often did to allow easy access:



**Figure 4.7 Nancy's Television and Telephone in her room.**

Nancy's only forms of portable ICTs were her notepad and pen, which she kept in her walker in a crocheted pouch:



**Figure 4.8 Nancy's Walker with her portable pad and pen.**

As the self-appointed resident advocate (she had previously been president of the residents' association) Nancy often would record events that happened in her notebook. She used these in advocating for other patients. She carried these in a crocheted walker bag. She commented that she often crocheted these for other residents, and would customize these for their items. If she owned a cell phone, she stated she would carry it on her walker so that it was always easily accessible: "If I could get a cell phone I could use the buttons on, I would keep it on my walker. That way I could text or call people anytime." (Nancy's desire to use a cell phone but the challenges presented by her physical limitation will be discussed later in this chapter.)

For the socializer, portability of devices is of utmost importance as it allows them to use them frequently. By moving their devices with them, the socializer sends the

message that they are always available and are able to stay in constant touch with the members of their social network. Their display of ICTs is quite different from the traditionalists, who focus on displaying their older forms of ICTs proudly and in prominent positions in the home, but concealing newer forms.

*Traditionalists' Display of ICTs*

Entering a traditionalist's home is often somewhat like entering a time capsule as far as the forms of ICTs that are easily visible. TVs are often prominent (and often there are multiple TVs in the living space- with the kitchen, living room, and bedrooms often holding a TV). Telephones and radios tend to be in every main living room as well. This was particularly true for Mindy Jean, who had three TV displayed prominently throughout her home in every living space she frequently occupied: the kitchen, master bedroom, and living room. Each of these TVs was the focal point upon entering the room.



**Figure 4.9 Mindy Jean's Kitchen television**



**Figure 4.10 Mindy Jean's Living Room TV**



**Figure 4.11 Mindy Jean's Bedroom Television**

Although the categories of ICTs suggest a time period before the present, the devices themselves are often quite new or newer versions. For the traditionalist, it is the form of an ICT that is important to them (for instance, radios and television are preferred to computers), not the vintage of the specific items they own. Having a 1950s to 1970s television that mimics furniture is not considered important, but having a television in general is important. Traditionalists love their traditional forms of ICTs and continuing to use those forms is far more important than the aesthetics of the ICT.

However, traditionalists often have a “if it isn’t broke, why update?” (Mindy Jean) mindset, meaning that if a device is still usable, they do not update to the latest version or technological development, as can be seen in the images above. This means that occasionally rotary dial phones are still present (particularly in lesser used rooms)

and often their televisions are cathode ray tube (CRT) televisions as opposed to LCD flat screen versions. The traditionalist is not opposed to updating these ICTs when the time comes necessary, but the traditionalist tends to not see a need to do so until an ICT breaks or becomes unusable.

Newer forms of ICTs, if owned, are often relegated to a spare room if possible (in the case of June, she only had a small living room, so the computer was placed in the corner- one would not notice the computer unless one entered the room and turned 180 degrees around and sat on the sofa). This placement of these ICTs echoes the traditionalist's views: older forms of ICT and media are preferred and celebrated; newer forms are rejected or tolerated.



**Figure 4.12 June's computer is hidden around the corner from where you enter the home and not visible until you come into the room.**

In June's home, ICTs were arranged mainly in the living room. Interestingly enough, she had three televisions in the room, mainly because she was unable to move them herself. She would have preferred to have a television in the bedroom, but was unable to move one of the large televisions into that room herself. The televisions occupied much of the room, and they were centered in the room as the digital hearth.



**Figure 4.13 June's televisions are immediately obvious upon entering the living room.**

June also placed her telephone and answering machine in her living room, which was the room she used most frequently. Although her computer was placed in the room, it was easily missed because of its placement in the corner. Since the television and phone were in the living room, she used these devices frequently. Every time I arrived for an interview, she had the television on.

In Mindy Jeans' home, televisions and telephones were present in the main living areas (kitchen, living room, and master bedroom). The radio was located in the kitchen, the space in which Mindy Jean spent most of her time as a homemaker. Even though Mindy Jean herself did not use the computer, her husband (George) was a practicalist and used a computer. George and Mindy Jean had traditional gender roles such that Mindy Jean was in charge of decorating the home, and therefore decided where the ICTs were placed:



**Figure 4.14 In Mindy Jean's and George's home, the computer, fax, and calculator were placed in an office, which Mindy Jean rarely entered.**

As a result, when Mindy Jean's husband, George, used the computer, it was out of her sight and did not interfere with her own ICT use. Since her husband did not enjoy (and was openly critical of) Mindy Jean's love of soap operas, Mindy Jean watched these in the upstairs bedroom when he was at home. This was the couple's primary use of the

television in their upstairs master bedroom: Mindy Jean watching soap operas. During the days that he worked, Mindy Jean was able to watch these shows in the kitchen or in the living room, which is where she formerly watched these shows before her husbands' initial retirement. Watching shows in the kitchen allowed her to prep meals and design crafts throughout the day, which made her more productive:

*I used to watch the soap operas while I used to prepare dinner. "Guiding Light" used to come in at a good time, because I'd have it in the background while making supper. The "Young and the Restless" was at lunch time cause I'd sit here and eat my lunch and watch. (Mindy Jean)*

Mindy Jean throughout the study waivered back and forth about using the computer and internet; although it often interested her to try it, she was not motivated to really use it, preferring her television, telephone, and radio to the computer. Her husband, George (practicalist), had purchased her a Netbook for Christmas. Mindy Jean kept the Netbook in its box in a hutch in the dining room. Like June, she placed the newer ICTs out of sight:



**Figure 4.15 Mindy Jean keeps her digital camera and Notebook computer in this desk, hidden behind the fold up top.**

The traditionalists' display of their items is different from the guardians. Essentially, the message that the traditionalist sends through their display is that older forms of ICTs are valued, prized, and integrated into their lives, while newer forms of ICTs are not valued, hidden, and tend not to be used as frequently. While the

traditionalist proudly displays her older forms of ICTs in the open and hides newer forms of ICTs, the guardian tends to prefer to hide all forms of ICTs in their home.

#### *Guardians' Display of ICTs*

Guardians tend to view ICTs as allowing individuals to display negative traits, such as rudeness, incivility, self-isolation, and regression of communication skills.

Therefore, ICTs are highly restricted in both use and display in the Guardian's home.

Upon entering the guardian's home, one is often struck by the lack of ICTs. In Margaret's home, a person could easily spend a week without observing a single ICT, except for the guardian's cell phone, as all the other ICTs were kept in a den space in the cellar:



**Figure 4.16 Margaret's ICT-Free Living Room**

This is in strict contrast to the enthusiast (see for instance Alice's photos) who displays ICTs proudly and therefore they are easily observed upon entering the home. For

the guardian, placement of the ICTs in a restricted spot prevents the guardian from over using these ICTs and falling victim to their own bad traits (rudeness, self-isolation, etc.) that can be triggered by ICT use. For instance, Margaret (who kept the main floor of her home ICT free with the exception of her partner's TV in the spare bedroom and her cell phone), felt that having a television on the main floor would lead to her using it excessively- allowing her to wallow in laziness:

*I'm not a big TV fan. I think it's become such a way of life, it's the first thing people do when they walk in the door is either turn on the computer or turn on the television. And it's not like, "how was your day in school today?" "Gee it really smells good in here it looks like you made something nice for supper." Boom, the TV's turned on when they come in the house. Sometimes I think with some people it's just like background noise. But the TVs got to be on or life's not going to be complete. I had an elderly gentleman come here for Thanksgiving. And he came in and he said "oh, this is wonderful, a real living room no TV. And I said "oh, there's a TV back there in the den." But that is where the TV belongs.*  
(Margaret)

The guardian's perspective on ICT placement tends to be quite different than the other types: they tend not to differentiate where ICTs belong based upon the ICT's age and relative introduction into their life (like traditionalists) and they do not place ICTs where they "belong" according to task and function (like practicalists). Instead the focus is very much on maintaining strict ICT spaces in the home (places where they can isolate the ICTs) but also ICT-free areas of the home (where they can "escape" the ICTs).

For instance, various Guardians would often say "electronics shouldn't be in bedrooms" (Jackie) or "a living room shouldn't have a TV in it." (Margaret). The focus in these comments is on where ICTs should **not** be placed in the home rather than areas where they belong (as the other types do). Those areas that guardian specifies need to be

ICT-free they work extremely hard to keep them that way, even if it means that their partner or other individuals find their ICT use restricted:

*My boyfriend has his own TV upstairs that he will watch all his news programs on. He'd be watching mindless TV, because he's the type that when he walks in the door, he turns the TV on. If he wants to watch TV he has to watch it on his own TV. I don't want to see it. (Margaret)*

In some scenarios, however, the Guardian is forced to live with an ICT in an active living space. Jackie, who had been forced to downsize after she was widowed, had her laptop computer in her bedroom, as her living room had been overrun by boxes of items she was trying to sell to make money. The only rooms left in her apartment were the bathroom, kitchen, and bedroom. For Jackie, the few ICTs she owned, mainly a digital camera, laptop computer, and a telephone, had to be kept in her bedroom. (Jackie did not own a television as she felt that the individuals on TV news were “liars.”) The placement of these ICTs directly in her living space caused her quite a bit of stress and worry:

*Well, this is my living area. So I don't really like my computer in the area that I'm living in - I don't like it where I'm sleeping because electronics just interferes with everything. I've read many places it's not good to sleep in or near these types of things. I read that you sleep better if you don't have it near you. I just read that you shouldn't have your cell phone near your bed when you're sleeping. You shouldn't even be holding your cell phone for that long of the time against your head, because people are coming down with brain cancer because they talk on the cell phone. I'm conscious of that kind of stuff. I'm conscious of health. I know all about it and I do things to avoid the problem. The computer's convenient because it's right here so I use it a lot. While we were talking I heard a click and then I knew I had an e-mail. So sometimes I hear that and I'll check to see what it is. I'm more likely to stop what I'm doing and check my email because it's right here and I can hear when I get one. (Jackie)*

For Jackie, the placement of her computer in her bedroom meant she checked her email more often and was more likely to interrupt her other activities to do so. For

Natalie, as she closed off her house with her hoarding activities, she found her living space reduced to the kitchen and family room. As she located her bed in the former family room, the only space left for the computer was in the former spot the kitchen table would have occupied in the kitchen. Since she stated she “had no need for a table because I have no family” she placed her computer there:



**Figure 4.17 Natalie's computer in her kitchen.**

Her television was placed in the family room across from her bed.



**Figure 4.18 Natalie's television placed in her living room, with her bed visible in the foreground.**

This was not the ideal situation for Natalie, who felt the computer belonged someplace else, but could not otherwise find a place for it in her home. For the guardian, if possible, ICT's were often hidden from view. In the case where they could not be hidden (mainly because of space constraints) this caused stress to the guardian, as it did to Jackie and Natalie.

By hiding all of their forms of ICTs, guardians try to send the message that they have balance in their lives (and do things other than use ICTs), that they value other activities more than ICTs, and that ICTs have a specific place that they belong in the home. The guardian also resists what they feel are societal expectations to have ICTs scattered throughout the home. By limiting where ICTs are placed in the home, guardians are able to limit their use of ICTs.

The next section of this paper addresses the meaning that these ICTs had to the five types.

### *Meaning of ICTs*

Meaning refers to the emotional value and significance that objects or events come to hold to individuals (Denzin, 2001). In this study, it was found that each of the five types prescribed a different meaning to their ICT devices, which is summarized in the table below.

**Table 4.7 Description of the Meaning of ICTs to the five User Types**

<b>User Type</b>	<b>Metaphor They Use to Describe ICTs</b>	<b>ICTs are viewed as</b>	<b>ICTs that have the most value</b>	<b>ICTs that have the least value</b>	<b>Overall Attitude towards ICTs</b>
<b>Enthusiast</b>	Toys	Fun	All ICTs	None	Positive
<b>Practicalist</b>	Tools	Work	Those with a practical purpose	Those that do not serve a practical purpose	Positive
<b>Socializer</b>	Connectors	Communication	Those that connect to others	Those that isolate	Positive
<b>Traditionalist</b>	Old Standbys; New Junk	Great (older forms); Indifferent (new forms)	Older Forms of ICTs	Newer forms of ICTs	Positive towards older forms; Neutral towards Newer forms
<b>Guardian</b>	Conduits for Good/Evil	Potential Pandora's box	ICTs which are used properly (depends on user)	ICTs that lead people to wallow in negative traits	Worried about social impact: Mixed Negative Feelings

The next subsections of this chapter discuss the meaning of ICTs in general to each of the five user types.

### *Enthusiasts' ICT Meaning*

Enthusiasts essentially see ICTs as fun toys. They approach all forms of ICTs from wanting to “play” and often self describe themselves as “little kids” or “children” when it comes to seeing new devices or learning new things about current devices:

*I've played with digital cameras. I've had a digital camera since the beginning to use here at work because we had digital cameras going back to the very first one... And they are great fun. (Harry)*

*Oh I love technology. I have ever since I started using it way, way back when. But I just fell in love. I love everything from the word processor to the projector to making film strips. Recordkeeping is so easy and when I discovered spreadsheets, I was just in love. I've enjoyed the advantages of this kind of thing ever since they started making it available. I'm like a little kid in a candy store. I love to play around with everything I just love this stuff. Love it. Love it! (Fred)*

For the enthusiast, ICTs take center stage in their lives. For two of the enthusiasts, Fred and Harry, ICTs represented a bulk of their careers as IT professionals. A significant amount of their daily lives is invested into ICTs: learning about them, using them, and finding new uses for them. The enthusiast's love for ICTs is often life-long. For instance, Fred talks about the importance that ICTs have had throughout his life:

*Two things have really shaped my life: photography and technology. I've been a photographer since I was in elementary school. I like photography, even dickered with the idea that maybe I would in college do something artistic. I was probably in 5<sup>th</sup> or 6<sup>th</sup> grade my father bought me a camera and I've been fascinated with cameras and really got into photography. Now even though I'm not an engineer, my dad would occasionally bring home these really fancy radios and whatever and so I got interested in electronics and then in college I got even more into it. If you wanted high fidelity it meant buying a kit and a soldering iron and you put it together. So I've always been interested in that kind of stuff. Technology got me jobs, and photography was always there. There are two themes in my life: technology and photography. (Fred)*

While enthusiasts will describe their ICTs as “loved,” this does not mean that they do not struggle with new versions or changes in ICTs. Many enthusiasts, although they were quick to get a smartphone, show no interest in having the latest version unless there

are substantial differences between versions. (If there is a substantial difference, the Enthusiast will let you know about it.) This is partially out hesitancy to learn to use a new device that might be complicated:

*I find the longer I have a piece of equipment, especially the smartphone, the more I find out about it.... I'm still choking over Windows 7, I'm getting better with it .When we got the computer with Windows 7 I had to get all the peripherals and programs that work with Windows 7. So I'm still fighting with Photoshop CS5, but I'm getting better at it. For about a year until the old laptop died I was sitting down here using the old version of Photoshop which was like three or four down from the new one, and putting my finished product on a thumb drive and going upstairs printing it because I could do in 10 minutes what it was taking me two hours to figure out on the new program. The fact that they change these things and end up confusing people is difficult. Don't get me wrong- I'm not going to stop using Photoshop, but I'm hesitant to upgrade once I know how to use a piece of software. I actually thought I had Alzheimer's I was having such problems using the latest version of Windows and Photoshop, because it seemed so much more difficult than the older versions. (Alice)*

But some of this reluctance to adopt the latest version also has to do with the fact that enthusiasts also tend to love their ICT devices and become very emotionally attached to them. Since they “push” the use of their ICTs and tend to be very familiar with all their features, if a new version is offered lacking those features or a piece of software is discontinued without an appropriate replacement, they often are quite sad and mourn the loss of a beloved ICT and its functionality:

*I had started using years and years ago an application called Sidekick. And Sidekick was a three part program: it had a database, it kept records, mostly names and addresses but it was actually a little database, you could keep just about anything you wanted on it. It could be a record of names and addresses and you could have separate databases. These could be my personal friends, these could be galleries, these could be just vendors that I use. It was very easy to look up information. I had a calendar with it so you could keep records of appointments. Up until Windows Vista it worked fine. Now I'm piecing together over 4 pieces of software to get anything near what Sidekick did and I still don't have the functionality. I really miss Sidekick. I considered going back to Windows*

*XP, but that doesn't really make sense. I wish they come up with a new version of Sidekick, I really miss it. (Fred)*

Enthusiasts not only love their devices, but their lives are entirely integrated with ICTs. Often, when calling an Enthusiast by phone or by calling on them in person, it is not unusual for me to encounter them enjoying using one or more of their devices. For instance, when I called Alice at one point, she relayed the following:

*I was sitting here and working on a slideshow. Give me a minute to turn the television down... I'm trying to manipulate several photos in Photoshop and have a bunch of programs open on my computer. I often work on several things at once with the TV running. (Alice)*

While enthusiasts love their ICTs, they know that for their age group, they are a bit “different.” They realize that many individuals in their age range are not, like they are, fans of new forms of ICTs. Sometimes this makes it difficult for them to relate to others in their own age group, or even to non-enthusiasts of any age:

*I'm quite hi-tech for my age group. I do know I am quite hi-tech but there's a lot of people that are more hi-tech than me of different ages because that's the circles that I run in. I prefer hanging out with people who are tech savvy, but I know a lot of people my age would think that is strange. In fact, a lot of people younger than me would think my level of tech savvy is strange! (Alice)*

For the enthusiast, most individuals speak about their love of ICTs. Often this is a theme from early childhood, when they were encouraged to tinker and try new technologies. Enthusiasts are essentially the evangelists of ICTs: they adore them and want to share them with others. This is quite different than the other types.

#### *Practicalists' ICT Meaning*

Practicalists view their ICTs as work and for practical purposes. They are most likely to describe their ICTs as “tools” and “for work.” They view each of their ICTs as having a practical and distinct purpose:

*I don't regard the internet as a toy; I use it for work, for very strategic finding of information, for getting something done. So I don't just search, I don't just roam around on the internet... I don't have time for that, and I don't want to do that. (Belinda)*

*I think it's what you do, whatever you do, whatever your livelihood is dictates the kind of equipment, the technology that you're going to require to do your job. Or it's what you're comfortable with, whether it be watching a lot of TV or playing a lot of CD's or talking on the telephone or text messaging all day. It depends on what you're going to use it for. (Boris)*

*I use the cell phone in a very practical way, it's strictly for communicating, if I don't have the home phone I use the cell phone. I don't do anything fancy on the cell phone at all, just send some voice messages and make calls. (Dan)*

Practicalists tend to like their ICTs to be useful, and have the most affection for those devices they see as fulfilling a purpose on their life. Practicalists do enjoy using their ICTs immensely, but they tend to see their use as fulfilling a task or doing a job, as opposed to purely being fun. Belinda, for instance, sees the internet not as a toy, but rather as a useful venue to find information and allow her to fulfill her job. Dan's use of the cell phone is strategic and purposeful, and the value of the device is that it is for communicating, something which he feels it does well and he values. Boris' comment highlights how many of the practicalists feel, that a person's life dictates the ICTs that individuals use: if they are into music they might use a CD player. His view of ICTs as equipment highlights the purposefulness of ICTs in his own life. Each of these comments tie the importance of the ICT as an object to its usefulness, and through its usefulness and practicality, the ICT comes to have value to the practicalist:

*I constantly am trying to push myself to use new tools. Like figuring out how to use Symbaloo and any new tool I run across or someone shows me. I use those in context of librarianship, so I try to figure out these new tools how they can be used for research assignments for kids. But I don't tend to go out looking for new tools; I find them out through others. (Belinda)*

A practicalist tends to not “play” with their devices, but is always on the lookout for new practical uses. They are often keenly aware about the devices that others around them use, often focusing on the tasks or ways that a person uses them. Compared to the other types, the practicalist cares the most about how a device can be used and the functions available on the ICT:

*I think you get set in your ways in using ICTs and you tend to do the same things every day the same way until one day you try something different and learn something new that's helpful. It kind of amazed me, I found out something that even my computer guy wasn't aware of. When I take the digital camera and put the pictures in the computer I can just hit transfer and it will transfer them. Well, one time for some reason I noticed a Canon icon on my desktop, so I clicked it. It's got every picture that I've got stored in that computer no matter where they're store. Now if you want to print them that's handy you can just click on them you pick your paper and how many pictures do you want on a page, hit print and you're on your way. (Boris)*

*Belinda's ICT use is pragmatic. If she needs to use it she will and she'll use it well. She would never get up at 5:00 in the morning and play with a piece of technology. (Peggy about Belinda)*

Practicalists see these devices as for their own use. Unlike the enthusiasts or the socializers, the practicalist tends to view their devices as solely for their convenience, their own personal tools. The practicalist is likely to leave their cell phone off and turn it on only when they wish to make a call, something which was spoken about previously in this chapter. This use pattern illustrates the meaning that such a device has to the practicalist: the cell phone is merely a tool, a tool that they use when convenient for them. When the practicalist views an ICT as a tool, they see the tool much like a hammer, something that Boris relayed to me:

*I see my cell phone like a hammer. I take my hammer out of the toolbox when I need it. I don't carry my hammer around with me everyday all the time. I use the cell when I need to make a call, just like I use my hammer*

*to drive a nail. I don't walk around carrying my hammer for someone else to use it, it's mine... These technologies they are just tools. (Boris)*

Hence, these ICTs serve a delineated purpose in that they are tools for a specific personal use to the practicalist. Those tools which have the greatest value are the ones that serve a practical purpose. This is in contrast to the socializer, who places the most importance on ICTs which connect them to others.

#### *Socializers' ICT Meaning*

Socializers are highly connected social individuals with large networks of intergenerational contacts. For the socializer, these relationships are the most important part of their life. Their lives center on family activities, religious activities, community involvement, and volunteering. All are deeply embedded within their neighborhoods and places of living:

*I'm on the telephone with shut-ins and I e-mail our lost boy Dominic. On the computer I'm always checking out things I am interested in and causes we're active in. We're very pro-life and involved with our church. We're very concerned with all these issues that are going on so I'm always on the computer getting information on all kinds of activities and things that are happening... My family is most important to me- we raised five children and they will always be the most important people in our lives. (Mary)*

*We wanted to get a flag for the assisted living center and I had written to our legislation and asked different politicians, and they finally got us a flag. Then we wanted to get a flag pole so we could have one outside and we worked to get that. We wanted to have a gazebo so we did all kinds of things to raise money to get that gazebo on our own. So there's been quite a few things I guess I was involved with here. That's not even getting into my crocheting for charity and for the residents here. I run the community store. (Nancy)*

*I think it's kind of natural for me to be involved in the community. I did not intend it to be so much- I've been honored quite a bit you know from different groups .... I just want people to respect themselves. I just want to help. I'm just Ms. Gwen but Ms. Gwen has a lot of fingers that reach and a big heart that reaches. (Gwen)*

Socializers tend to love their communication devices. To a socializer, an ICT is a device or a means of connecting them to others. The importance in any device is how it allows them to build and maintain relationships. Therefore, ICTs are essentially a means of connection, a device that can deepen existing relationships and form new ones.

*Another thing that we really enjoy it about the computer is getting pictures sent to us from the children. Our son has muscular dystrophy and he was home for Christmas. While he was home his cousin installed a chairlift at their house. It is wonderful that he has it. We wanted to see what it looks like so our daughter-in-law sent a picture of it over email. It was so tremendous to see how it fit in because of course we're visualizing it taking up the whole stairway and I thought that really was very nice to actually see it when we couldn't travel there. Then we gave a Nook to our daughter and she sent a picture of our grandson who is 7 sitting there reading a book on the Nook. So that I've been appreciating more the connection we get from the computer. (Mary)*

Socializers want to use all of the ICTs their friends, family, and community members use. Socializers, along with enthusiasts and practicalists, tend to be the most up to date users of devices in this study (within their financial and health limitations). This focus on wanting to use devices that younger generations are using is not on being “hip” or appearing younger than they are (although most people in their social networks believe that socializers seem young) but rather on the socializer wanting to be in touch with the younger generation. Since they wish to maintain their relationships with younger generations, they must maintain those relationships through the types of ICTs that younger generations use:

*I have to text. I'm forced to do texting because some of my grandchildren just will not answer the telephone. They have their phones on vibrate so they just will not talk on the phone. So if I want to ever talk to them I have to text. (Gwen)*

Socializers tend to view ICTs that allow them to connect (typically communication devices or devices that can be used socially) as much more valuable than ICTs which they feel are isolating or are intended to be used alone. For instance, Nancy saw the television and Wii as social ICTs, as they allowed her to connect with her community through volunteering and to create a sense of community where she lived:

*I like the Wii. We'll have tournaments on the Wii, and people love it. Especially people who like to bowl but can't physically do it anymore. It really brings the community together in a way that we otherwise couldn't because so few of us can be active. (Nancy)*

Gwen had a similar feeling about her television. She was not a fan of television, preferring to spend her time reading, writing, or socializing. She felt that the television was isolating and the only times she really watched it was when she had guests over to watch a program, particularly her grandchildren. Both Nancy and Gwen represent the socializer's viewpoint of the television reflects how socializers view ICTs: any ICT that can be used by the socializer to connect them to others is highly valued; whereas those that are not seen as connecting them to others (or isolating them from others) are not valued. While Nancy uses the television to connect to others, Gwen does not. Therefore for these socializers, the television represents different things. The television is highly valuable to Nancy, but holds little value to Gwen. This reflects that the meaning is not in the ICT itself, but rather in the relationship that is held between the individual and the device (Lie & Sørensen, 1996; Silverstone, et al., 1994).

Socializers tend to also highly value other forms of ICTs for their potential to connect them to others. Both Gwen and Mary were writers, and they viewed the computer and word processing (upon which they each were writing books) was a way for them to share their faith and beliefs with others:

*I do a lot of writing... It's important to me that I write every day I can. Writing is so important. It has helped me heal from the trauma in my life. Writing has helped me heal and has helped me share. Family is just so strong, so strong and so important. Passing history on is very, very important to me. Writing is not only important to me and my family but just passing things on is really important to do. So much of our history [as African Americans] is lost, and it's so important to be passed on. There's a proverb and it says if you have knowledge let others light a candle to it and I certainly believe that is important- that I share my knowledge with others. (Gwen)*

*Now I probably would not have written a book if I didn't have Word, because I do not have a good handwriting. I would just scribble it all out. But when we got the computer and Word it was absolutely a huge gift. I totally, I really am a big admirer of Word because it has made writing a book so easy to share and write. My book is very important to me, it's about my faith and life as a mother. (Mary)*

Gwen also was extremely attached to her digital camera as well, as she used it to take pictures of nature. She then had these photos printed and used them to make greeting and thank you cards. She felt this let her personalize her cards, and made them more heartfelt. She felt this drew her closer to those she sent the cards to:

*I love photography. I think the skies and the trees tell us such great stories and whatever. I make cards out of some of my photographs and I send people out different pictures I take. I write a little poem that goes with the picture. My soul speaks to me and I just write out what comes into my head and pick out a picture that is special to me. It is made for that specific person, made only for them. That makes it special. I love my digital camera, because it allows me to make these special cards. (Gwen)*

Unlike the other types that might view the word processor as a tool or the digital camera as an instrument of leisure, to the socializer these are ICTs that draw them together to connect with others and deepen relationships. The meaning of an ICT is a device that allows this connection to take place. This is in contrast to traditionalists, who see different meaning in ICTs depending upon their newness.

### *Traditionalists' ICT Meaning*

Traditionalists are strongly attached to older forms of media and ICTs. For them, they differentiate between older and newer forms of ICT, with newer forms of ICTs being seen as “lesser” than older more familiar forms. Traditionalists tend to describe older ICTs with affection, including the television, radio, and landline phone:

*I love my television. I watch it all the time. I really love the TV. I like the older shows... (June)*

Traditionalists are rabid consumers of these older forms of ICTs. They view these ICTs often as friends, or as company. For many traditionalists, they use these ICTs almost constantly during their waking hours: unless they are on the phone, their television or radio is on. They tend to view these ICTs as companions and less as devices:

*“Guiding Light” I used to watch once in a while. That was on during my time that I used to prepare supper for everybody to come home. I’d have it in the background. “The Young and the Restless” was at lunch time and I’d sit here and eat my lunch and watch. I used to watch “As the World Turns” and that went off the air too. I remember “The Guiding Light” and “As the World Turns” used to be on the radio. They came on at different times that I had a chance to sit down or if I was busy in the kitchen. It was nice to have something playing in the background; otherwise you get lonely all day. (Mindy Jean)*

Of all the types, traditionalists tend to be highly attached to their specific shows and genres on these traditional forms of ICTs. Mindy Jean was extremely attached to her soap operas, something which she had a long running relationship with since being a little girl, as she can remember listening to them on the radio as a child. For the traditionalist, newer forms of ICTs are not nearly as valued, and are seen as of little use to the traditionalist. The proper place for newer forms of ICTs is often the drawer, under the bed, or behind the sofa:

*I keep my notebook computer in the desk. I don't think it needs to be out all of the time. It's not really nice enough to have out in the open. I make my husband, George, keep his computer in the office. I wouldn't let him have it out here in the living room. Computers don't belong in the living room. You might have a TV in the living room, but not a computer.*  
(Mindy Jean)

While the traditionalist prefers older forms of ICTs to newer forms, they do not tend to have negative feelings towards new devices. They may even find them fascinating. They are not resistant to trying them. However, they often find that these newer devices fall short of their expectations, as Mindy Jean relayed about her experience with her notebook computer:

*Everybody talks and talks about the computer. But is that really all you can get for online shopping? I wanted to see if there are really good deals on online shopping, everybody says you have to go online for the best deals. But I can get better deals than that at the mall.* (Mindy Jean)

For the traditionalist, they view new ICTs neutrally, whereas older forms of ICTs are viewed very positively. New ICTs are judged against the traditionalist's beloved older forms of ICTs, and they often find that new ICTs fall short compared to their old devices:

*My computer I use once in a while. I like to play games on it. That's about it. It's ok. It's not as nice as the TV. My kids bought the computer for me. Otherwise I wouldn't have one. Why would I want a computer when I already have a TV?* (June)

The traditionalist simply cannot see "what the fuss is about" (June) when they have a perfectly acceptable television, radio, and telephone that they love. Whereas the traditionalist tends to view newer forms of ICTs neutrally (neither negatively nor positively) and older forms very positively, Guardians tend to view all ICTs as having potentially negative impacts on society.

### *Guardians' ICT Meaning*

What tends to be the hallmark of the guardian type is the existence of one or several extremely negative experiences with ICTs in adulthood. These experiences often represent the slow reduction of one's career due to technological intervention, the dissolution of a marriage and abandonment of family, or the loss of one's livelihood. It is in these experiences that ICTs come to have meaning. For Margaret, the introduction of newer forms of ICTs, most notably the television and the computer, represented the slow erosion of her job from an enjoyable position as an associate sales representative where she had power to act on client requests, to the reduction of her job to simply being a secretary who had little social interaction and little autonomy:

*I was the sales assistant to the manager of the branch and part of my job was to talk to people until he was ready to see them because he might have somebody else in his office. So I developed a very good rapport with people and sometimes they'd say, "Well we don't really need to see him anyway, this is what we want to do" and it would be taken care of by me. But then there became a time after everything became computerized that I was more or less told by somebody higher up than my boss: "You're spending way too much time with people, just get the order, get whatever it is that they want, and then get them out of here." We used to have an old ticker tape up in front of our office. On a daily basis we might have 30 or 40 people that would come in every single day to watch the ticker tape. Some of them would just sit up there, have their coffee, check the ticker tape, maybe put in an order here and there, but it was like a gathering place. Well then they took the ticker tape out because it wasn't generating any business according to the higher ups. They didn't understand that it was a community gathering place and it did bring in business. So then they put in a TV after they took out the ticker and some people came in to watch the ticker tape go on the bottom of the TV, and eventually the higher ups took that out too. Then after a while I was told "you can't be giving out quotes over the phone unless they have an account here, or unless they've done business within such a period of time." It went from being kind of like a semi-family friendly place to work to being just a place to work where there was more stress... Once we got email, it was just "send me an e-mail" rather than calling. Then people just became just an e-mail rather than a person. So we lost that personal contact and that's the thing I don't like about it. Now I know that's not all the computer's fault, but it*

*was just a whole mindset of instead of that one-on-one human contact being the priority- the computer was the priority. It's cold, it's sterile, there's no feeling of camaraderie. It became man against the machine. I'm not against progress you know, we need to have progress, but I think it's just gone too far. (Margaret)*

Natalie associates ICTs with the loss of her family. Of all of the negative experiences that Guardian's relayed throughout this study, Natalie's story of how she felt that ICTs separated herself from her husband and son, creating distance that led to a divorce and her son disowning her, is among the most heartbreaking:

*There were two men so two TVs in our house. So I'd be upstairs sewing or listening to the radio or music on a tape that I had. They wouldn't let me watch anything I wanted to watch. They'd watch TV for 8 hours a night and wouldn't talk to me. I can remember when we got our cabin. The cabin was to get my son out of the city - out of the suburbs. We went up there and we only got one channel on TV. So my husband and son would drive 7 miles to a convenience store and rent DVDs - a video. They wanted a dish on the roof and I put my foot down and said "No, this place is for us, not for TV." We bought that place to be a family and save our marriage, not to sit there mesmerized by some mindless program. I had my sewing machine, and their TV went in the next room. For some strange reason my sewing machine made snow on the TV. So when they were there I couldn't sew. So I was glad when they weren't there- all they did when they were there was watch TV and not talk to me anyway. At least when I was alone I could sew. Because what's more important- you sit there and watch TV or you spend time with your family? The TV disrupted us being a family. I asked my son to teach me to use the computer, but he said I was too stupid to learn. So after my husband and son moved out I was free to use the computer, the TV.... I finally got to use these things! Because they had monopolized everything- that is all they cared about- the TV and the computer- not me! (Natalie)*

For both Margaret and Natalie, the introduction and use of ICTs into their lives represented a depersonalization of their work and personal lives, respectively. For Margaret, computerization represented a cold, non-human and non-humane work environment. Margaret recognizes that the computer or television did not directly cause the depersonalization, but instead where devices which the higher ups in her work used

for “cost saving” and “streamlining.” The people in her office were valued less than the computers. In fact, the people were put directly at odds with the computer. By choosing the computer over more personal methods, Margaret’s employers were suggesting to her that not only did she not matter, but people did not matter. Similarly, for Natalie, her experience was that the TV and videogames were abused by her husband and son, who chose these ICTs over their relationship with her. When she tried to save the relationship through buying a cabin, her husband and son again chose to use the ICTs over their relationship with her, and in fact, used their preferred ICT, the television, to take away a task that she enjoyed (sewing) and eventually push her physically and emotionally away to the point where she preferred to be alone rather than with her family. For Natalie, she recognizes that ICTs themselves are not to blame, as she enjoyed using the computer and the TV once they left. However, she felt that they cared more for their ICTs than for her. Both Margaret’s and Natalie’s experience reflects the guardian’s views that it is not the ICT which is negative- but the use of the ICT in a negative manner that matters.

There may be a tendency by overall society to view Guardians as “negative naysayers” to new forms of ICTs. However, most Guardians do not outright reject ICTs, nor are they critical of their existence by default, despite having overwhelmingly negative experiences with ICTs during their lives. For the guardian, ICT’s represent a sort of Pandora’s Box: they hold both good and evil, and unfortunately, they feel that society prefers to delve into the evil and use ICTs for bad purposes:

*I feel that there's a need there's definite need for all this modern technology. There's a need for it but I think it's just like many, many things it's overdone. I think it's absolutely mind-boggling ridiculous that cars now have TVs in them. Look out the window. Enjoy, see what you're seeing. It's removing them from a part of life that I think is important. I think it's important to sit down and have a conversation with mom and*

*dad... I believe a happy life is a life of moderation. Yes, use a computer, use a cell phone. The cell phone is wonderful because you can be in the grocery store and realize that "oh gosh do I need that?" And you could call home and say "can you look in the cupboard and see if I need such and such or" or you can call somebody and say, "I'm running late. I got caught in traffic." But you go to the mall and you see people walking around and they're just talking on the cell phones. Talk, talk, talk on the cell phone. I thought you went to the mall to go shopping. So I think that people go overboard on all that stuff. (Margaret)*

*I think that there's a lot of abuse on the Internet and it's coming from big companies. That's the worst part. We all know that the population has a certain amount of criminals in it. But you don't expect big corporations to be part of those criminals. And they are more and more. I could go on, we'd be here for 10 hours... if I went into all of it! (Laughs.) My computer is what allows me to be aware of this manipulation by the big companies, because I won't watch TV. TV is just a bunch of brainwashing. The TV lies, and I abhor lies. Those TV news people will actually lie. They literally look into the camera and lie. (Jackie)*

For Margaret and Jackie, they both see the good in ICTs and use them in ways that benefit them: Margaret uses her cell phone as an emergency and convenience device, and Jackie uses her computer to do research and read the news. However, they both feel that these devices can be used for evil and negative purposes: at the least negative end of the spectrum they can remove people from relationships and at the worst they can be used to outright lie and manipulate people. Therefore, it is not the device itself that is negative, but how it can be used that is negative.

Guardians feel strongly that they live in a society which does not have good boundaries, morals, or education for young people on how to effectively mix ICT devices with other areas of living so that they can live balanced and fulfilling lives. For the guardian, use of certain ICTs often leads to total absorption if a person is not careful. This total absorption removes the user from other parts of their lives and therefore removes them from important relationships and their marriages and work suffer:

*I see these technologies as taking up a lot of time that could be spent actually living rather than watching. Especially things like 3D where you participate in a world that is generated instead of the real world. To me it's a copout. It's also very "one-manship": it doesn't include other people. It's very isolating. They're replacing human relationships with technology. It's easier to do that than talk to someone. Talking to someone takes work. Using the technology is more convenient. It's always available. You don't have to work at relationships. Just push a button. (Natalie)*

Given the guardian's own highly negative experiences in which they have seen their marriages and work lives destroyed and attribute their destruction to the ICTs involved in the relationship, it is not surprising that the guardian comes to associate ICTs as the easy alternative to relationships. For Natalie, it was easier for her husband and son to be absorbed in ICTs than to work on their family life, much like it was easier for Margaret's workplace to treat her as a simple secretary than view her as an individual and value her work beyond her job description. Therefore, these ICTs have the ability to draw people in and remove them from the relationships that are important. Many Guardians spoke at length about how important it was to set boundaries to prevent this total absorption, and how their own parents (and themselves as parents) set these boundaries as children:

*There are other things to do besides technology. There is the old adage that there's a time and place for everything. It's just like everything else. It's kind of like when kids are little and you set boundaries on dinner time. If I make something new, you have to try it. If you don't like it, fine, I won't make it anymore. But we got to have something where we have a balanced meal. We will sit down and eat dinner together. You're not going to go in the den with your little plate so you can watch some television show. We're going to sit down and have a family dinner, because this is our time to share. This is our time to discuss what you did today. This is our time to get together and socialize. It's not going to be just come in, grab a bite to eat, something, whatever is in the refrigerator, and then go lounging in front of the TV until bedtime. That's not going to happen. I see young families today that use a certain amount of constructive discipline and I see that they do much better with their children than the ones that just let*

*them do whatever they want to do. Control the family. But it's not just technology - it's just life. (Margaret)*

Margaret's analogy of dinner time reflects many of the guardian's feelings towards ICTs: in moderation they were fine and good, and that people should be open to trying new things. However, there should be boundaries on their use, much like parents place boundaries on their children's meal times. The need to place these boundaries on children is not just due to ICTs, but is rather a general need in all aspects of a child's life. This emphasizes that ICTs are not just a negative influence, but rather they can become one if such boundaries are not in place, much like eating unhealthy snacks.

Guardians see their selective active resistance as part of a greater cause to better society. By choosing not to use certain ICTs they prevent the negative behaviors from gaining ground in society. By not purchasing ICTs they view as violating their privacy or encouraging corporations' poor behavior they prevent organizations from financially and socially abusing citizens. By modeling good behavior they provide examples for others (particularly younger birth cohorts) to follow; and by setting boundaries and rules within their family and friendship circles they see themselves as creating a sub-culture of positive use. The guardian sees herself as being an activist in society. Whereas the enthusiast might be an activist to encourage use; the guardian is an activist to encourage people to consider their use in a much wider social perspective of ICTs:

*I was angry when I found out my MP3 player wouldn't work because it was too old and they wanted me to buy a new one. It was only a few years old! I was literally angry. When I'm angry I fight back by not buying the products anymore. That's the way I fight back for everything I don't like. I don't go to banks I don't like. I cut the credit cards of banks that have given me a bad deal. I resist. That's what I'm doing, I'm resisting, I'm boycotting. That's what I do when they make me angry. I choose and I tell everyone I know my experience. So that they also are aware, because that's the only way you're ever going to be effective is that if enough*

*people know it something will happen. If enough people do it something will happen. A company will change. (Jackie)*

*Really I find it offensive when I see the waste. I grew up in the Depression and the War and I find it offensive that people today don't understand want versus need. I go to people's houses and they are wasting food... and I see people waste technology too. Sometimes I'll see someone with a smartphone and I think "gee I wonder if I should really get one of those" and I go "no, because you would never use it to the capacity, you don't need it and you don't really want it, and if you think you want it it's only because somebody else is telling you should want it." People don't understand the difference between a want and a need anymore, and all this technology stuff does is cause unrest. The companies make you want it. People are wasteful throwing all their old technology away. All they want is new, new, new. (Margaret)*

Both Jackie and Margaret reacted negatively to what they perceived as wasteful behavior in society. Margaret attributed this to her upbringing in a time when they had little; and in fact compared wasting technology with wasting food, something which she found offensive as a former child who often had barely enough to eat. Both of these women resisted attempts by companies to make them purchase new devices, but they felt that society at large did not resist enough. For Jackie, she spread the word of companies that she felt encouraged waste and actively resisted buying their products. Margaret felt that society had lost a major value of recognizing *want* versus *need*; something that was critical to cutting waste. Guardians often feel misunderstood by other individuals, who either view the Guardian as overwhelmingly negative or simply fail to lend any validation (or recognize) the Guardian's feelings towards new forms of ICTs:

*I feel like I live in a different era than everyone else. I am content with what I have. I just sometimes think that the younger generation has so much input into their lives that they don't get a chance to just sit down and enjoy life. I'm not a negative person, I just feel so strongly that life is not compromises. Life is so much better if everything is done in moderation. I'm not knocking the wonder of the computers or all the modern technology that we're so lucky to have! I'm just saying that I think it's*

*become an obsession with a lot of people. But other people think I'm just strange. (Margaret)*

Perhaps the most damaging of these tales of being misunderstood comes from Margaret, who slowly saw her job deteriorate and become more regimented (and far less enjoyable) during the introduction of computers to her workplace. When Margaret was planning on retiring, her coworkers originally planned to buy her a computer as a retirement gift:

*My work wanted to get me a computer when I retired, but they bought me a cell phone instead. They wanted to buy me a computer? I had enough of computers at work. I was leaving because of the computer. (Margaret)*

One can easily imagine how Margaret felt. Not only did her coworkers and supervisor completely miss how she felt regarding the changes in her employment that came about with the introduction of the computer as it was happening, but these individuals could not see beyond their own views of ICTs to recognize Margaret's hatred of a device that took away her job, her livelihood, and the enjoyment she had in her work. Not only did they not see it, but upon her retirement (something she would not have considered doing until she was much older before the introduction of the computer) the gift that was supposed to show their appreciation for her work was the same device that was making her leave. If one puts him or herself into Margaret's state of mind, one can see how easily how insulted, angry, and sad she felt for being so basically misunderstood that her coworkers suggested buying her the device she associated with her reasons for leaving her once beloved job:

*When I went to work in 1980 I really liked my job. I loved my job. It was interesting, there were always people around. I really loved my job and I didn't really consider it stressful even though it probably was. I used to go in on Saturdays sometimes. I didn't get paid for it but I used to go in on Saturdays just to get my desk organized or to check up on a few things that*

*I hadn't had time for during the week. So I think I was more apt to bring my work or my job home with me back before the computer. Once the computer came in I was still very dedicated and devoted to my job and I was well respected, but when I left there at night I left, I left my job at the office. I didn't come in extra. I didn't love my job anymore, my job had changed. (Margaret)*

Unlike other types, who might state that they do not use an ICT because it is impractical, expensive, or they have a preference for existing technology, Guardians are quite specific in how the ICTs they do not use promote bad societal behaviors or encourage corporate corruption. For instance, Jackie stated that they did not have a Smartphone because “they track you. It’s not right for corporations to track your every move.” Similarly, Margaret indicated that she didn’t have texting because “I want to see the world, not spend my time in a cell phone.”

As can be seen from the section above, each of these five types of users exhibits a different domestication pattern. The final sections of this chapter examine other significant findings from this study that go beyond the user typology.

### **High Level Findings that Cross User Types**

Several higher-order findings were also found in this study that cut across the user types. These included findings about choice to use ICTs, the impacts of choosing to not use newer forms of ICTs on relationships, gender, the impact of type of position and ICT exposure, and the importance of social support to providing access and technical help and support to older adults. These findings reflect potential influences or interaction of types and potential conflict of these user types. The rationale for choices, relationship of patterns to gender, and these other issues are addressed in the following section.

*“Choice” of using an ICT & Relationships*

One of the significant findings of this study was the importance of “choice” by the older adult in using ICTs. For all of the older adults in the study, using an ICT was seen as a choice, as was choosing not to use an ICT. All of the participants seemed quite well versed in what new technologies did (or could) do. For instance, all of the participants talked about Facebook, including how you could add friends, post pictures, etc. even if the participants had never used Facebook themselves. If participants did not know something about an ICT, they would often ask the researcher to explain how it worked and provide examples. Therefore, the choice to use or not use an ICT like Facebook was an informed decision. However, the participants in the study understood that choosing to use or not use an ICT had consequences. Mindy Jean had chosen to not use the Netbook her husband had purchased for her, and understood there were things that were online that she might enjoy or learn from:

*Most of my friends know a little bit about computers and they're able to look up things or order things that you'd be interested in. I think there's a lot on the computer. I know there's so much on it. I see my kids work it, I see my daughter work it all the time. I see my husband work it. I know I'm missing out. But that doesn't mean I want to- or have to- use it. (Mindy Jean)*

The decision to use or not to use a particular ICT was seen as a choice by secondary participants as well, including both other members of the Lucky Few birth-cohort and other birth cohorts. However, the choice to *not use* an ICT often had dramatic consequences for relationships between the Lucky Few and individual in a younger birth-cohort.

Secondary participants would often mention that they saw the primary participants (and others of the same age) use of ICTs as a choice. They often would

mention that they knew members of the Lucky Few with diverse use patterns: “I’ve got friends that won’t even own a cell phone, you know, so it really depends on the personality of the individual and I think how much you want to be part of this technological piece,” stated Daniel on her impressions of the Lucky Few. Charles reflected about the partner of his neighbor, Margaret:

*Anything that would make his life more complicated he doesn't really want to be involved with. It's not that he's an old fart; it's just that his business is fairly well set. You've got to respect that. It's not stupid; not using new technologies is a very mature way of looking at stuff. (Charles)*

Charles saw his neighbor’s choice to not use a computer or any other new form of ICTs as valid. Although being a part of the “technological piece” was seen as a choice, a member of the Lucky Few birth cohort choosing to not use ICTs such as the computer, internet, and cell phone was often seen as limiting and isolating by other birth cohorts. Julie shared her thoughts about her own mother and how she felt their relationship could have been strengthened through ICTs:

*I remember trying desperately to get my mother on a computer... the relationship I wanted to have... There was so much that had changed in technology that I could then share things with my mother like 'oh look here's a picture of this', or 'here's what I'm doing today'... I couldn't have that relationship with my mother because she wasn't into technology. So it limited my world of expression. (Julie)*

Not only did Julie feel her mother’s choice limited her mother’s (and even her own) expression, but it was seen as preventing them from having a closer relationship, something which she was immensely sad about. Even further, her mother’s non-use of ICTs led Julie own self-expression in the relationship to be somewhat limited. She felt that her mother’s non-use impacted their ability to connect on a deep level where Julie could share her own experiences. These feelings were reflected by many of the

participants, who felt that the older adult being involved in using ICTs brought them closer together than if they were not using these ICTs, and also that non-use impacted their ability to form a close relationship. The primary participants were well aware of these feelings of younger birth cohorts, but often felt that their struggles were misunderstood by society in general.

### *Struggles and Societal Understanding*

Even among the most technically savvy of the participants, there was a sense that ICTs were indeed difficult and often complicated to use. Many of the participants expressed concern that ever-evolving technology would “leave us in the dust” (Dan). This concern was compounded by a sense that society had “forgotten that old people exist” (Jackie). Alice, the most technologically skilled woman in the study, commented that she often found herself frustrated and lost when learning new versions of ICTs:

*I'm having trouble with keeping up with the technology- it's very frustrating. I was having so many problems with the technology (Windows 7- a new operating system) that I went to a neurologist and said “What's going on? Do I have Alzheimer's?” My mom died of Alzheimer's, so I was worried I was getting it. But I'm fine. It's just that I'm not keeping up with the technology as much as I feel I should. (Alice)*

All of the Lucky Few participants felt that society at large did not realize the difficulties they faced in learning, using, and purchasing new ICTs. While most of these struggles were seen as relatively minor (such as not being able to receive a paper bank statement), all expressed worry that such struggles were “the tip of the iceberg” (Margaret), or a “warning signal” (Jackie). There is concern that a time would come when the alternatives they depended on would not exist, something that Margaret mentioned was already happening:

*The technologies I struggle with now are just the tip of the iceberg. It is going to keep getting more and more confusing for us older folks. The old technologies won't exist. Recently I had a little incident with my local bank. I got my bank statement for my checking account. There was a two dollar charge on there for paper statement. So I went to the bank and they said "well, that's the way it will be from now on." (Margaret)*

For Margaret, who already struggled using email and the internet, having to do online banking was something that she felt went far beyond her skill and comfort level. For now, she took solace in the fact that she could get a paper statement for a small charge, but she feared a future where that was not even an option and all statements were electronic. Even more worrying to the older adult participants was their sense that younger people did not understand their struggles and therefore were insensitive to providing alternatives or help, as indicated by Margaret:

*I think that younger people have better skills because they're so young. Their minds are just so plastic. I'm sure that if we had had the same technologies we would've picked it up too. It would've been what you did. We didn't have a television until we were teenagers. Young people can't understand how difficult it is- they were born into it. (Margaret)*

These feelings of society not understanding the difficulties that older adults faced in learning new ICTs were echoed among all the participants, although women tended to be the most vocal about their concerns.

#### *Gender Roles & ICT Domestication*

The table below shows all five types with the participants in the study identified by their gender and type. It is important to note that no male Socializer, Traditionalist, or Guardian types were found in these comparative case studies, something which will be addressed further in this section and in the next chapter. Both male and female enthusiasts and practicalists were found in the study.

**Table 4.8 Participant's User Types by Gender**

<b>Type</b>	<b>Men</b>	<b>Women</b>	<b>Totals</b>
<b>Enthusiast</b>	Fred Harry	Alice	3
<b>Practicalist</b>	Cleveland George Boris Jack Dan	Belinda	6
<b>Socializer</b>		Gwen Mary Nancy	3
<b>Traditionalist</b>		June Mindy Jean	2
<b>Guardian</b>		Jackie Margaret Natalie	3
<b>Totals</b>	7	10	17

Beyond this clustering of types, gender role impacts in the study were minimal. It is possible that if this study had more male primary participants (rather than just 7), male socializer, traditionalist, and guardian types might be found. It is also possible that women are more likely to be socializers, guardians, and traditionalists due to their gender, which will be discussed in the following chapters.

One significant area where gender did impact ICT use was found in relation to work, with women who held traditionally and historically “pink collared” occupations having dramatically different exposure levels to ICTs. This will be discussed in the following sections.

#### *Impact of Work on IT Access, Support, and Knowledge*

One of the original interests in doing this work was to examine the relationship between work status (if one was working, retired, or stayed at home) and job type (type of career) influenced IT access, support, and knowledge. Although previous studies have

suggested the importance of work on older adult ICT use and exposure (Czaja, 2001; Larwood, et al., 1997), none to date had examined how working, retirement, or staying at home influenced access, support, and knowledge of ICTs. If a person is working in a position which requires ICT use, that position normally provides ICTs (sometimes even ICTs which can be taken home or used for personal tasks), free ICT training and support, as well a working environment of peers that can provide informal technical help.

With the goal of studying the impact of work on ICT use in mind, it is interesting to examine if user types seem to be determined at all by work status (briefly defined as being Retired, Working (Full or Part Time), and Stayed at Home). It is important to note that this dichotomy is somewhat artificial as many of the individuals had diverse career trajectories- a phenomenon that is established in both the case study descriptions earlier in this chapter but also in the following tables that break apart this work status in greater depth. As can be seen in the table below, however, across current work statuses a diversity of types are seen. Due to the small number of case studies, it is quite possible that with more participants, each type could be observed in each work status. It is also possible that certain types are more likely to develop based upon work experiences. For instance, all of the Guardians in this sample had worked and had a bad experience with ICTs in work or family life during middle age. It is also possible that certain user types may be more or less likely to stay or leave the workforce come retirement age or given the opportunity to stay at home.

**Table 4.9 Participant's User Type By Current Work Status**

Type	Work Status			
	Retired	Working Part Time	Working Full Time	Stayed At Home
<b>Enthusiast</b>	-	Fred	Alice Harry	-
<b>Practicalist</b>	Cleveland Jack	Dan George	Belinda Boris	-
<b>Socializer</b>	Gwen Nancy	-	-	Mary
<b>Traditionalist</b>	June	-	-	Mindy Jean
<b>Guardian</b>	Margaret Natalie	Jackie	-	-

Work was often an important area of exposure, access, and technical help, something which many individuals in the study had mentioned. Both Fred and Harry worked directly in the IT field, and both commented that their work was extremely important to keep them up to date (something which was required by their position) but also that it provided them with the newest ICTs that they otherwise could not afford, even on their current incomes:

*At work, I've had access to a digital camera since the beginning. We had digital cameras going back to the very, very first one. My boss was very involved in the design and implementation of digital cameras with Hewlett Packard, so I've had them from day one and used them. I stuck with film for my own personal use but it became expensive. So I just bought my first digital camera a few months ago, when the price came down on these things because before I just couldn't afford one. (Harry)*

It was common for individuals who were still working to mention the help that they received from technical individuals at their jobs, something which Belinda mentioned frequently about both her new and old positions. In some cases these were formal IT personnel, but in other cases, they were coworkers who supported the individual with daily help, support, and tips:

*I am the kind of learner that if I don't do it I don't learn it, so you can't just tell me or give me the instructions... I want someone to sit with me to*

*talk me through, but not hold the controls themselves, I want to be doing it so that I can learn it. I want you to set me up and teach me how to do it and then I'll do it. I've gone down to my technical support office at my work with my laptop. The last time I did I said, "My webcam doesn't work, help me," and one person there is really good. (Belinda)*

*I have a friend, a professional and personal friend who is really good in technology so a lot of the things that I've learned I've learned through working with her. For example, I was staying with her over Christmas when I was trying to construct my courses on Blackboard so we figured out a lot of things together. So she doesn't teach me everything but a lot of the things I've learned through her. (Belinda)*

Two individuals in this study had previously worked in white collared positions full time, but had moved to part-time pink or blue collar positions. Jackie, who had worked in the insurance industry and had become a server; George had worked in the pharmaceutical industry and worked as a retail associate for a large discount department store. For Jackie, she went from a relatively heavy ICT involved career in the insurance industry to a career where her only ICT use is her magic-jack phone, which allows her to find out about short-term serving opportunities. Similarly, for George, working in the discount retailer meant that he no longer used ICTs in the same way that he had as a pharmaceutical executive. Instead, his interactions centered on an inventory device called the Telson and computer-based training:

*I use this thing called a Telson at work. It's common at a lot of retail chain stores use them, they pinpoint where a thing is not only in the inventory but where it goes on the shelf, how many there is, what price it is. It fascinates me every day. All price changes are done through the computer. Sometimes those managers will have 300 or 400 price changes in a day... It just fascinates me how they move merchandize around, all thanks to this little Telson thing. I also do a lot of computer-based training. (George)*

Whereas individuals who were still working often spoke about the advantages of working on their ICT access, use, support, and knowledge; individuals who were retired

often discussed how their workplaces had tried to help them in their retirement. For instance, Cleveland received his work laptop as a gift when he retired, which allowed him and his wife to replace their older desktop:

*We always had a desktop with a tower once we got our first computer. Not too long ago ours crashed and my husband had brought a laptop home when he retired. Basically they gave him his laptop that he had used for work as a retirement gift. (Mary on her husband's, Cleveland's, laptop)*

Margaret's former workplace also gave her an ICT gift when she retired, a cell phone with a year's paid plan. For Margaret, this was her first cell phone, and it was unlikely she would have begun using one so early if it had not been a gift:

*The only reason why I had a cell phone is when I retired people asked my kids what could they get me for a retirement gift. Could they get me a computer? My daughter said "No, no, no. No don't get her computer. She won't use it. Get her cell phone. If you have any money left over, get her a nice phone, and just pay part of the plan." They got me a real nice cell phone and a couple of years' service. That was a nice gift because otherwise I wouldn't have gotten a cell phone for years. (Margaret)*

Although both Margaret and Cleveland were given ICTs as gifts from their workplaces, many of the individuals spoke about how their retirement had changed not only how they used ICTs, but also their ability to access them and technical support. Natalie, who had formally run her own biological testing company with her ex-husband, retired in the mid-2000s when their company was sold as part of her divorce. As discussed before, her position had supplied her with not only access to ICTs, but also to a secretary who knew how to use these devices. This allowed Natalie to always have an expert and access to any ICT she wanted. Since new ICTs could be charged to the business (and come out of pre-tax money) this meant that these ICTs were less costly to her than if she had paid for them out of her income. When she retired, however, she lost access to all of these ICTs:

*When I needed to copy something I went over to Staples and bought my first copier. I didn't have a job anymore because I retired and I needed to copy things. I used to do it on the work copier. The business used to pay for the work copier, but now when I need a copier I have to pay for one myself. The same with everything else- the computer, the copier, the printer, the fax... (Natalie)*

For Natalie, who had a small social network, she relied heavily on a friend whom she had formerly worked with before starting her business for technical support:

*I have a friend, he's a technician. You have to catch him in the right mood to get him to help you. But I worked with him before we left to start our own business. But basically I have him and a cousin who help me out. But my cousin is very sick right now so I've been relying more and more on the technician. (Natalie)*

For those individuals who had stayed at home, Mindy Jean and Mary, all of their technical training and access to ICTs were through their spouses, George and Cleveland.

For Mary, her husband Cleveland was instrumental in providing her with technical support and help:

*Cleveland was so helpful when we first got a computer. Our daughter was living with us, and she showed me a couple of things. Occasionally I still get stuck and Cleveland is always there and ready to help. And our kids and grandkids still teach me stuff and are very patient with me. (Mary)*

For Mindy Jean, she often felt her husband was not supportive of her learning, and that if she had been exposed at work, she could now use the ICTs she struggles with:

*My husband, George, well, he's a man. Men aren't patient. They're not good at teaching people things. He doesn't let me try things, he just yells at me when he gets frustrated with me. He can do it so quickly and he doesn't remember a time when he couldn't. Sometimes I think it would be easier for me if I'd been exposed to computers at a job like he was. (Mindy Jean)*

Although both Mindy Jean and Mary both struggled to learn ICTs, Mary found support from her husband and family in learning to use these devices, whereas Mindy Jean lacked such support in her home and among her family. Therefore, although women

who chose to stay at home may struggle using ICTs, having a social support system that provides technical help, purchases devices, and offers moral support when facing challenges can make the difference between a person being successful at using ICTs (like Mary) versus being unsuccessful (like Mindy Jean).

From the analysis of work status, it is clear that the work environment provides not only exposure to new ICT devices, but also technical training, access, and social support of coworkers. Upon retirement, many individuals lose access and free technical training. Although having a moderately high retirement income can help individuals to replace these lost resources (such as Natalie's case), having a supportive social environment that can provide technical support and help is critical to maintaining an individual's skills in retirement and for women who stayed at home. The importance of having social support was not only critical for those in retirement, but also for those who were low income.

#### *Position Type and ICT Exposure*

The following table tries to delve more deeply into the work trajectory of these older adults by examining their overall career path; be it in a "white collar" (typically professional industries), "blue collar" (typically trades, manufacturing, or service industries), or "pink collar" (typically service, administrative, and other positions that have been historically female-held jobs).<sup>12</sup> In addition to these broad categories, there

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<sup>12</sup> After several considerations of how to examine and categorize the types of careers, I decided upon this categorization for two reasons. First, this reflects the writings of several authors who have examined the Lucky Few's work trajectories (most notably Carlson (2008)) but also because it captures the unique features of these jobs better than simply reducing them to "knowledge workers" versus "labor workers." Although many of the women in this study were knowledge workers, this label doesn't capture the fact that they were working in traditionally female-held knowledge worker positions that are often considered to be "lower status" (and therefore lower pay) than positions in the same knowledge industries traditionally taken by males. There was a substantial difference seen in exposure to technology between the "pink" versus the

were two participants, Jackie and George, both of whom left (in the case of Jackie) or retired (in the case of George) from prestigious positions within their white collared executive jobs to work in the service industry. It is also interesting to note that both women who participated in this study and chose to stay at home after getting married and having children previously had worked in “pink collared” positions: Mary as a dental hygienist for two years and Mindy Jean as an administrative assistant/secretary.

At first glance, it is quite surprising how many women participants worked in “pink collared” positions: six out of ten of the women who were working or retired had their main careers in a traditionally and historically female-held occupation. These included nursing (Alice, Gwen, and Nancy), administrative assisting/ secretarial work (Alice, Gwen, June, Margaret), and education (Belinda). In addition, Jackie moved from a white collared position as an executive for an insurance company to a pink collared position as a server. In many cases, these women worked several different pink collared occupations throughout their working career: from secretary to nurse (Alice) and from nurse to secretary (Gwen). However, the number of women working in these types of positions reflects historical demographic data from this birth-cohort: Lucky Few women made the greatest strides in employment in “pink collared” occupations. While more Lucky Few women maintained positions of employment throughout adulthood than previous birth-cohorts, the vast majority of these occupations were in the “pink collared” occupations. It is notable, however, that two of the ten female participants, Natalie

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“white” collared women employees, with the “pink collared” women having earlier and longer sustained exposure to ICTs than the white collared women. This finding is particularly interesting, as it is often assumed that the “more educated” an individual is, the more likely they are to be exposed to ICTs- something which was not observed in this study. Being a pink collared knowledge worker was far more advantageous to early computer exposure due to pervasive thoughts at the time about computers being the domain of IT professionals and clerical workers.

(microbiologist) and Jackie (Insurance Executive), held white collared positions for a substantial part of their careers.

**Table 4.10 Work Trajectory (Type of Occupation) by User Type**

Type	Overall Broad Categorization of General Work Trajectory/ Career Path (Blue, White, or Pink Collar)					
	Blue Collar	White Collar	Pink Collar	White to Blue	White to Pink	SAH (Pink Collar Previously)
<b>Enthusiast</b>		Fred Harry	Alice			
<b>Practicalist</b>	Boris Jack	Cleveland Dan	Belinda	George		
<b>Socializer</b>			Gwen Nancy			Mary
<b>Traditionalist</b>			June			Mindy Jean
<b>Guardian</b>		Natalie	Margaret		Jackie	

As can be seen by the above table, there is little difference between the types as far as the types of positions worked or the career trajectory. A significant finding, however, was that the type of position worked did impact early exposure of older adults to ICTs, with those women who worked pink collared jobs often being exposed to ICTs before men or women in white or blue collared positions, as can be seen in the table below.

**Table 4.11 Exposure to Computer Technology in the Workforce by General Work Trajectory**

Decade of Exposure to Computer Technology	Overall Broad Categorization of General Work Trajectory/ Career Path (Blue, White, or Pink Collar)					
	Blue Collar	White Collar	Pink Collar	White to Blue	White to Pink	SAH (Pink Collared Previously)
1970s	Jack	Fred Harry				
1980s	Boris		Alice Belinda June Gwen Nancy			
1990s		Cleveland (late 1990s)	Margaret	George	Jackie	
2000s		Natalie Dan				Mary
2010s						Mindy Jean

Fred, Harry, and Jack were three individuals who very early became involved in using computerized technologies in the workplace, with Jack working around IT (maintenance and repair of electrical systems) and Fred and Harry becoming IT professionals. The next large portion of individuals who became involved in using computerized technology were women who held pink-collared positions- mainly as secretaries, nurses, and a librarian. These women represent a large wave of the first initial knowledge workers who had hands-on experience working with computerized ICTs: pink collared workers. Interestingly, although computers were introduced into her office in the 1980s, Margaret's supervisor allowed her to keep her electronic typewriter until the mid-1990s when she was forced to switch to a computer. The first computer savvy knowledge workers among the Lucky Few were pink collared workers.

These women's early experiences with computers tended to be much different than their counterparts in white collared positions: both male and female. Since the computer was seen as "pink collared work" (or as both Natalie and Dan put it, "secretarial work"), white collared workers such as Natalie, Dan, George, and Cleveland tended to have others who did this work for them:

*If I needed something done on the computer I had my secretary do it. That was her job; I had other things to do- that's why we hired a secretary.*  
(Natalie)

*When I did my Ph.D. it was all mainframe stuff, so there are huge differences between mainframe and current computers. There were typists and secretaries. So there were people who did that and did it for you. Now of course you'd be expected to do it all yourself no matter your position in the organization.* (Dan)

As a result, many of the white collared workers were not exposed to ICTs as early in life as many pink collared workers (with the exception of those who were involved in IT professions). Although pink collared positions are often considered to be much lower in status than white collared positions because of lower pay and respect (Carlson, 2008), being a pink collared worker actually worked in these women's advantage when it came to learning new forms of ICTs. Although several of the pink collared workers expressed mild frustration or concern over their ICT/ computer skills, most of the pink collared workers were more much more confident in their skills and able to accomplish more than those white collared workers who were exposed to computers in the workplace in the following decades. The level of frustration and confusion of white collared workers was much higher than those who worked pink collared jobs:

*I really wished I had learned to do these things when they were new. I get really frustrated. Then I walk away. I keep thinking if I had learned it early, like my wife did when she was a secretary, I would be better off... From the time she was very young in her work my wife had to use*

*typewriters, computers, filing systems and everything that you use in an office. (Dan, white collared worker)*

*Sometimes I get a little frustrated with things. But I sit back and say to myself, "you can figure this out." I don't give up. I don't give up. I learned very early how to use these things in my work, and I know I can learn them again. (Gwen, pink collared worker)*

It appears that early exposure is much more critical to gaining confidence and computer skills, and that being a pink collared employee provided these critical opportunities. Blue collared workers were also exposed earlier to computers and computerized technologies in the workplace than most of the white collared workers in this study. Boris started his own business and computerized his records early on while Jack was involved in electrical repair and maintenance work on a large supercomputer at a military base:

*I got the first computer over 30 years ago to manage my files, do invoices, and keep records. It's part of running your own business. (Boris)*

*I worked on one of the first supercomputers in the area. In fact, it was the largest computer in the world at the time. (Jack)*

Those who switched from being white collared to blue collared positions, both Jackie and George, switched post-retirement from their previous positions and by that point had been exposed to computers.

Work type appears to have had a strong impact on the decade of first exposure to computerized ICTs, which in turn had dramatic impacts on the older adult's own confidence and experience using these forms of ICTs. White collared IT workers and pink collared workers tended to be exposed to computerized ICTs the earliest, with other white collared workers and women who stayed at home being exposed the latest to ICTs. While the timing of exposure to computers (early versus late in their career) did not

appear to impact their user types, it did have consequences for the confidence levels these individuals had in their own computer skills.

### *Income versus Social Support*

In the literature on older adults and ICT use, income is often presented as a significant barrier to older adults purchasing and using ICTs (Eastman & Iyer, 2004; Iyer & Eastman, 2006; Reisenwitz, et al., 2007). Interestingly enough, although having a higher income did benefit many of the older adults in the study as far as purchasing power (the ability to replace something if it was broken or became obsolete), it was far more important for an older adult to have social support in order to learn and obtain devices. Although having a high income with a supportive network was the ideal situation (combining purchasing power with technical help and guidance), many older adults lacked one of these things. For instance, Natalie often struggled with learning new ICTs, as her small social circle was made up of very few individuals with ICT knowledge. This was despite her having a relatively high retirement income:

*I wish I had a 12 year old kid. You need a twelve year old kid to help you with this stuff. Even if I can buy it, that doesn't mean I can use it. I don't have anyone really to help me, either. I have no family. (Natalie)*

For those with relatively high incomes (even in retirement) but with low levels of social support, like Natalie, the lack of social support was seen as far more detrimental and limiting than income. For Mindy Jean, who often bounced back and forth between wanting and not wanting to learn to use a computer, the fact that she owned a Netbook computer (purchased by her husband), was of little consequence to her ability to learn to use it. Although she had a large social network, most of her friends were not ICT users and her children were not interested in teaching her:

*I have three children, and the one child who would really help me learn lives down south. My two children who live up here both work with technology, but my son who is a chef and lives down south is the one of the three that would help me. But he is too far away. So I am stuck. I have this thing I can't use. (Mindy Jean)*

Both Natalie and Mindy Jean had the financial ability to buy a number of modern electronic devices, and were quite open about that fact. However, their lack of social support to help them in using the devices led to them facing challenges. For other individuals of moderate income, both Margaret and Boris spoke about having friends who were their technical help people. In the case of Margaret, she had a neighbor and a family friend who helped her extensively, particularly in the beginning, but also when she needed to purchase new devices:

*Charles is like a son to me. He helped me purchase my last computer. He helped me so much in the beginning. He is so patient. He picked out the computer based upon what would be good for me and what my budget was. (Margaret)*

Boris also spoke about the role his friend played in technical help to him, guiding him through problems and also providing recommendations:

*I have two friends that are both into computer repair as a business. I can call either one of them and probably 75% of the time we can fix the problem right over the telephone, I just don't know what to do. I'm a little computer illiterate at that end of it. They can tell me where to go to and what to do and if I can fix it. If it's a mechanical problem there are still parts available. We've upgraded it and put a lot bigger memory in it and of course I upgraded the monitor to a flat screen, and they helped with that. (Boris)*

Where the importance of social support versus income becomes most apparent, however, is for individuals who were low income in the study: Gwen, June, and Jackie. Gwen lived in section 8 housing, whereas June lived in a low-income independent living facility for seniors. For Gwen and June, both individuals lacked the financial ability to

purchase new devices for themselves, but owned many new devices- for instance- both owned several cell phones, a music player, and digital cameras. Most of these devices were gifts from loved ones:

*My girlfriend moved to Texas and she gave me this cell phone. She said she wanted me to forever keep in contact with her. She said it won't break, if it does take it back to the store and give them my name and get it fixed. So that's a blessing. (June)*

*My sister gave me a computer, but I never got it set up. My son, the sheriff, gave me a computer. I would go to his house sometimes and I'd get on the computer. He had an extra one and he said, "Mom I'm going to get this all set up for you." My children are very, very good to me. I had a car accident and I think my son was more or less worried about me, knowing that I was in pain a lot of times. I had different surgeries and he wanted to do something nice for me, and that was giving me the computer. They buy me cell phones and all sorts of stuff. (Gwen)*

When a device was broken, stolen, lost, or damaged, neither June nor Gwen had the financial ability to replace it themselves. However, when Gwen's digital camera was stolen, her social network through her church quickly pulled together and bought her a new one as a surprise:

*About three and a half months ago my camera was stolen. I was just in someone's home with about ten people there, someone stole it, and I was so hurt. So I went into church the other day, and the pastor said to me, "Some people found out your digital camera was stolen and they wanted you to have this." He handed me a package and it had a digital camera in it. I couldn't believe it! Now I need to figure out whom to thank. (Gwen)*

For Gwen, her access to devices was as great as many of the other participants in the study (despite being from a much lower income bracket) due to her social contacts. For Jackie, many of her electronic devices had been purchased by her late husband, when they were in better financial circumstances. However, because her husband had purchased her an Apple computer, and there was an Apple Store in the local mall, she had free technical support and classes:

*Apple has a free program [Apple Training One-on-One] to teach you how to use your computer. When you buy a new Apple, you're entitled for three years - to spend \$100 extra for the lessons. You can go once a week for help one-on-one. I could make an appointment and I could go in there and whoever's going to be my help person for the hour says to me "What you want to learn?" It was me choosing what I wanted to learn and she or he's showing me how to do what I wanted to do. It was fabulous... The Apple program is a big blessing. Apple's program has made me a confirmed Apple user. (Jackie)*

In this case, despite having a small and widespread social circle, Jackie was able to find the technical support she needed to learn to use her computer. This suggests that for low income adults there may be ways to facilitate their ICT learning, exposure, and need for technical help even if they lack a supportive social network. However, because she lacked a larger social network, she said that if her devices were to fail, she could not replace them, something which had already happened to her:

*If my computer broke, I couldn't buy a new one. When things break now, that's it. I cannot afford to replace them. When my printer broke- that was it. I just wasn't going to have a printer anymore. I have enough bills as it is. (Jackie)*

Therefore, it is not low income older adults who are at risk of lack of access, but rather low income adults or older adults in general who have small social circles.

Although the literature has often presented income as being a key to older adults obtaining and using new forms of ICTs, in this study it was found that having social support was much more important for older adults to learn their new devices (even if their social support was commercially provided) but also that having a large and involved social network could overcome financial limitations.

#### *Physical Limitations on Device Use*

A final major finding of this study is that physical limitations often determined which ICTs an individual could use, often more so than their desire to use these devices.

One ICT which Nancy had been eager to learn was the cell phone, primarily for the purpose of texting with several of her grandchildren and children. However, since Nancy is on a limited income, the only phone she could afford was a government provided cell phone. These are cell phones and plans run by private companies (but underwritten by the federal government) which individuals who receive federal or state benefits (such as Food Stamps, disability, public housing) may qualify for. One such plan is Assurance. However, much to Nancy's frustration, the buttons on her Assurance phone were much too small:

*I had one of those little phones and that thing drove me crazy. It's so small that it makes it very difficult to try and use it properly because you're always hitting the wrong buttons. I found that if you have arthritis or you have anything wrong with your hands it's almost an impossibility to use a cell phone. So I wish someone would somewhere along the line think about the elderly and give them a bigger phone, something that they can use on a regular basis. It was too small. I sent it back to Assurance. (Nancy)*

Nancy's experience with the Assurance cell phone illustrates several important things. First, socializers, like all of the other types, are not necessarily always free to use the devices they would like to because of physical or mental barriers. In the case of Nancy, her arthritis left her unable to manipulate the buttons despite her wanting desperately to learn how to text:

*Texting is something that all of the kids are doing right now. My oldest great-grandchild is 13 and she's texting all the time too. I might be a little slower at pushing the buttons but I would be able to do it if I wasn't overdoing it and hitting two or three at a time. They have the big phones and the large phone numbers for people but I don't think anyone has thought about keeping the cell phones from going too tiny. There are people that are in their 20's with arthritis and I bet they're having the same problems we elderly are. (Nancy)*

Therefore, use of a device (or similarly non-use) of a device does not fully capture a user's type- as potential users may be unable to use the devices they wish to.

Secondly, this underscores how designers of devices often ignore the older and/or disabled population in their design of devices. The Assurance cell phone came up repeatedly in this study, as many of the low income participants owned such a phone due to their financial status. However, most of the individuals found these phones difficult to use. The figure below provides a picture of such a device- which is smaller than many cell phones available to the general public on the market. In fact, the entire phone is about as large as three hard candies placed end to end (visible in the picture) and the buttons are closer together and smaller than a typical TV remote (also visible in the picture). The buttons are so small that they cannot be manipulated with a pencil eraser, as the pencil eraser is larger than the buttons:



**Figure 4.19 The Assurance Phone**

These experiences indicate that even if a person wishes to use a device and has access to it, physical limitations still exist and impact use. Particularly disheartening is the fact that older adults with physical limitations who are low income are often provided devices that are inappropriately designed or sized for an older or physically impaired user.

### Summary of Findings

This chapter presented the findings from this dissertation, reviewed in the summary table below. These include the unique domestication processes for each user type, how the Lucky Few's choice to use ICTs is viewed by other birth cohorts, how gender roles impact user types, the impact of work on ICT use, the influence of social support in affecting ICT access among lower income older adults, and how physical limitations influence ICT use.

**Table 4.12 Summary of Findings**

<b>Findings</b>		<b>Description</b>
<b>User Types</b>	<b>Introduction to ICTs</b>	ICT introduction varies based upon types: enthusiasts are self-seeking or exposed through enthusiasts, practicalists through work; socializers through social networks; traditionalists through gifts (family and friends); guardians through gifts and self-purchase
	<b>Use of ICTs</b>	Use varies considerably based upon type due to differences in meanings assigned to ICTs by each type: enthusiasts stretch ICTs into every area of their lives; practicalists see ICTs as serving a specific purpose; socializers view ICTs as connections; traditionalists use and love their older forms of ICTs (rejecting newer ones); guardians only use ICTs (or use them in a way) that are not harmful.
	<b>Display of ICTs</b>	The placement of ICTs in the home differed based upon user types, with different types choosing different types of ICTs to be displayed (or choosing to not display ICTs at all)
	<b>Meaning of ICTs</b>	Each of the various user types attributes different meanings to ICTs

<b>Findings</b>	<b>Description</b>
<b>Societal Understanding and Choice to Use ICTs</b>	Lucky Few birth cohort members felt their needs and struggles were misunderstood by younger birth cohorts. Younger birth cohorts felt that it was a “choice” for older adults to use ICTs, however; the choice to not use an ICT often had dramatic ramifications on relationships between the older adults and younger cohorts
<b>Gender Role Differences</b>	Among this sample Guardian, Traditionalist, and Socializer user types were all women; Practicalists and Enthusiasts were mostly men
<b>Work Trajectory Findings</b>	Those working had greater access to newer forms of ICTs, technical training and help, and support compared to those who retired or stayed at home
	Women who held “pink collared” positions tended to be exposed to computerized ICTs earlier than white collared or blue collared men or women or women who stayed at home
<b>Income Versus Social Support</b>	The most important determining factor in older adults access to and their receiving technical support was social support; regardless of income level.
<b>Physical Limitations and Device Use</b>	Physical limitations can have an impact on an older adult device use; particularly limiting if the older adult does not have access to more accessible devices because of income

The final chapters of this dissertation focus on the practical implications of this research, lessons learned from the application of this method and working with members of the Lucky Few birth cohort, and potential future research based upon the findings and limitations of this current study.

## **Chapter 5 Discussion**

The largest contribution of this work was the discovery of different user types: the practicalist, the enthusiast, the socializer, the traditionalist, and the guardian. These user types suggest that individuals have different styles of domestication and assign different meanings to the ICTs they use and do not use in their everyday lives. Each user type has specific reasons why they choose to use the ICTs they use and reject other ICTs based upon the meaning these ICTs have in their daily lives.

This chapter is split into several large sections. The first section concentrates on how the findings of this study fit within other theories of ICT use. The second section explains the findings of the study in terms of existing literature from domestication studies and gerontechnology. The third section of this chapter concentrates on the contributions of this study to further domestication and gerontechnological research. The final section of this chapter explores the possible societal impacts of this research, focusing on the implications for design of ICTs and ICT policy.

### **Theory of User Types Fit Within the Existing Literature on ICT Use**

The User Type Theory that was discovered through this research reflects and compliments other existing theories that have explored ICT use or related phenomenon, while still contributing new understanding to how individuals are introduced to, use, display, and give meaning to those ICTs. Two existing theories that will be discussed in depth are Kaarst-Brown's (1995) IT Cultural Archetypes and Rogers (1962) Diffusion of Innovations.

*Kaarst-Brown's (1995) Theory of IT Cultural Archetypes*

Kaarst-Brown's (1995) theory of IT cultural archetypes was developed from an intensive ethnographic comparative case study of two different organizations in North America. Based upon over 80 interviews with employees at those two organizations, Kaarst-Brown discovered that within each organization there were several emergent cultural views of ICTs. Emerging from her work was five different cultural technology archetypes, with each archetype having a different overall view of ICTs, based upon the individual's assumptions about ICTs. These assumptions about the nature of ICTs informed different views of how ICTs should be used appropriately in an organization. These cultural archetypes have implications for how ICTs and IT departments/functions are viewed within an organization.

Kaarst-Brown's (1995) five different archetypes are shown in the table below, and a brief description is provided for each.

**Table 5.1 Description of Kaarst-Brown's (1995) Five IT Cultural Archetypes**

<b>IT Cultural Archetype</b>	<b>Description</b>	<b>Implications for Organizations</b>
<b>Revered IT Culture Archetype</b>	IT is viewed extremely positively, with IT professionals being well respected and revered	IT has high status; IT is well-funded and regarded; IT specialists are considered heroes
<b>Integrated IT Culture</b>	IT is viewed in terms of its cost benefit to clients; IT skills are based upon need	People (users and IT professionals) are seen as equally competent and IT innovation is driven by client needs
<b>Demystified IT Culture</b>	IT is viewed as something that anyone can do- not just IT professionals	IT projects occur throughout the organization (often without involving IT) and users see IT as something they can (and will) do without technical specialists
<b>Controlled IT Culture</b>	IT is something that should be controlled by the senior business leaders	IT is controlled through policies and buffers separating the IT department from others; IT departments are understaffed and/or under-budgeted
<b>Fearful IT Culture</b>	IT can "hurt people;" innovations are feared	IT innovations may be resisted and feared; a last resort

Much like this study, Kaarst-Brown (1995) did not originally seek to discover the cultural patterns and underlying assumptions about ICTs that she did, but these patterns emerged inductively from her in-depth interviews and observation at two organizations over a two-year period. There is a high degree of complementary similarity between Kaarst-Brown's theory and the one presented in this document, however; there are also some differences. Kaarst-Brown's study's five cultural patterns- the revered, integrated, demystified, controlled, and fearful IT cultural pattern, parallel the five user types found in this study (see the table below).

**Table 5.2 Comparison of Birkland's User Types to Kaarst-Brown's (1995) Five IT Cultural Archetypes**

<b>Birkland's (2013) User Types</b>	<b>Comparison to Kaarst-Brown's (1995) "IT Cultural Patterns" (Underlying Assumptions about ICT's)</b>
Enthusiasts	Revered IT Cultural Pattern
Practicalists	Integrated IT Cultural Pattern
Socializers	Demystified IT Cultural Pattern
Traditionalists	Controlled IT Cultural Pattern
Guardians	Fearful IT Cultural Pattern

For instance, enthusiasts who "love" and "cherish" their ICTs are comparable to the revered IT cultural pattern that Kaarst-Brown (1995) discovered, where ICTs are honored and respected, and turned to for solutions to a wide range of problems. In many of the enthusiasts' tales of their love for ICTs, they often spoke about how they influenced their work environment by bringing ICTs into the workplace, exploring them to their full potential, and encouraging others to use them. Much like in the revered IT cultural pattern, ICTs (and those who used them) were revered by the enthusiast.

Enthusiasts tended to enjoy working in what could be labeled as revered IT cultures-. For

example, Fred often spoke about what fun it was to work at his school when he was given free rein to use, invest in, and explore ICTs in his work to benefit the students.

Conversely, enthusiasts are highly critical of work environments where they feel that ICTs are not valued or used to their full potential- hence Alice's mild frustration with the home health care agencies she works for and their lack of technological use and involvement.

Practicalists who tend to see ICTs as "tools" for specific purposes correlate to the integrated IT cultural pattern, where the use of ICTs in organizations is seen as driven by a balance between needs of users and technical capabilities. Information technologies are evaluated on how they contribute to the organization's well being. A non-useful or non-productive device simply does not matter to the tool focused practicalist. Similarly, in an integrated IT culture, ICTs are judged based upon their value to solve problems.

Practicalists tended to enjoy working in integrated ICT cultures where the value and purpose of the device was clearly defined. For instance, Belinda enjoyed finding ICTs that fulfilled her student's needs to learn specific content (such as using Twitter to explore what would be said in Valley Forge). Boris, in his own business as a contractor, had similarly outlined the value and purpose of ICTs devices to his own work. Adoption is based on careful evaluation of cost benefit with consideration of non-technical solutions.

Socializers, who view ICTs as "connectors," have little interest in ICTs that are not social in nature, and want to use the things that the younger generations tend to use, most closely mirror the demystified IT cultural pattern of users who tend not to seek the skills of IT professionals within organizations. All of the primary participants in this

study commented on how young people (particularly children and teens) were highly knowledgeable and experts on ICTs. Similar to Kaarst-Brown's analogy of the wizards apprentice who envies and seeks to emulate the wizard's power, the socializer strives to achieve the same level of knowledge and skills as the younger generations with which they interact (particularly their children and grandchildren). This reflects how individuals in a demystified IT culture wish to use the devices for themselves much in the way that an IT professional would, bypassing the need for the IT professional to be involved. The socializer wants to use their ICT devices in the same way that the experts in their lives (children, grandchildren, other community members) use them, and to be as knowledgeable and self-sufficient in doing so. All three women socializers, Gwen, Mary, and Nancy, strived to use those ICTs which they knew younger generations were using, such as texting. In a display of how Gwen felt her knowledge of ICTs was comparable to younger generations (and therefore the cell phone and texting was demystified), Gwen commented on how she often made up texting acronyms and knew all the acronyms her grandchildren were using.

Traditionalists, who view old forms of ICTs with love and affection but have little use or desire to use more modern forms of ICTs, most closely reflect Kaarst-Brown's (1995) *Controlled IT Culture*. In the *Controlled IT Culture*, ICTs are viewed as things that should be carefully contained and restricted. Organizational leaders are viewed as the ones to drive how and when IT is used. Many traditionalists, who believe they should be able to control which technologies they use, choose to avoid using more modern ICTs. It is interesting to note that the study by Kaarst-Brown was examining IT cultures in organizations, older forms of ICTs (such as telephones) also fell under the definition of IT

devices (and the domain of IT professionals) by those in the organization. In contrast, because her study set in on the work environment, many older forms of ICTs that are often considered predominately leisure rather than business (such as television and radio), were specifically not included. While the traditionalist mirrors the controlled IT culture, Kaarst-Brown's controlled IT culture archetype could possibly be extended to the broader social environment to incorporate this split between work and social that traditionalists experience between more modern (often at work) and older forms of ICTs (often at home). (Unfortunately, none of the traditionalists in this study were still working, so it is difficult to draw conclusions about newer technologies that might be found in the work environment.) The traditionalist, such as Mindy Jean, values those older forms of ICTs such as the television and radio they are familiar with, but also *controls* the placement of newer forms of ICTs in her home- relinquishing her husband's computer to an office and her unused Netbook to a drawer.

Guardians, who view ICTs with suspicion due to people's ability to use the ICTs in ways that harm society, reflect the Fearful IT Culture Archetype. The fearful cultural archetype tends to view ICTs, particularly new innovations as possibly causing harm and in particular, "harm to people" (Kaarst-Brown & Robey, 1999, p. 121). This fear of "harming people" echoes the guardian's fear that if new ICTs are used inappropriately they erode and damage society. Interestingly enough, as seen in Chapter 4, many of the guardians expressed how they were fearful of the ICT innovations that occurred in their jobs, a reflection of the fear that Kaarst-Brown and Robey (1999) described. This fear, based upon the idea that ICTs can be used negatively (and in the cases of many of the guardians, ICTs were used negatively in their workplaces (Margaret) or their homes

(Natalie)), often was extremely salient for those participants. For Margaret, the computer was not only something she feared, but something that caused her so much anxiety and made her life so miserable that she disengaged from her job years before retirement and eventually retired early.

Ideally, one can think of these two theories as meshing together and complementing each other as opposed to competing. User types may be an underlying factor in creating IT cultural patterns in organizations based upon individual assumptions about ICTs. For instance, a group of ICT enthusiasts in an organization may lead to a revered IT cultural pattern being observed. As a result of the enthusiasts' love, affection towards, and willingness to play with ICTs (as well as their own reverence for others who are also enthusiasts), their assumptions may lead to ICTs having high status in an organization where IT professionals are revered and ICT skills honored: a revered IT cultural pattern. A contingent of guardians in an organization may lead to resistance of new innovations that are seen as destroying the culture of the organization.

Even more interesting is something that Kaarst-Brown (2005) has written about: how an organization's overall outlook on ICT innovation is shaped by the CEO's or founder's underlying assumptions about ICTs. Using this theory of user types integrated with Kaarst-Brown IT Cultural Archetypes, it would be possible to understand how an individual's own user type could potentially impact the culture of an organization, or how differences in user types across the organization could lead to cultural conflict.

With these two theories intermeshing so closely, a good question is how are these theories indeed different? These theories are different on several levels, which are outlined in the table below.

**Table 5.3 Comparison of the User Typology and IT Cultural Archetypes**

	<b>User Typology</b>	<b>IT Cultural Archetypes</b>
<b>Analytical Level</b>	Individual	Organizational; Groups
<b>Patterns Observed</b>	Individual Differences	Cultural Patterns
<b>Context</b>	Everyday Use Across several life contexts	Organizational IT strategy
<b>Method</b>	Interpretive Comparative Case Studies	Ethnographic Comparative Case Studies

First, Kaarst-Brown's (1995) theory of IT Cultural Archetypes is a group-level theory that examines culture in organizations; whereas the User Types theory is an individual level theory that examines how individuals domesticate ICTs. These user types are patterns of individual characteristics. The focus of the User Types theory is on how these individual characteristics influence domestication, rather than understanding group cultural patterns of attitudes towards ICTs. Secondly, the application of each of these theories is quite different: the IT Cultural Archetypes theory focuses on cultures within organizations, whereas the User Typology focuses on individuals in greater society (and specifically on older adults). Thirdly, the IT Cultural Archetypes theory is focused on exploring and explaining patterns in the relationship between IT strategy and business strategy within broader organizations, whereas the user types theory is focused on exploring and explaining patterns in older adults ICT domestication in their everyday lives. Many of these differences are due to the goals and methods of the two studies. Since Kaarst-Brown set out to explore culture through ethnographic comparative case studies she observed cultural patterns. In contrast, this study used an interpretive comparative case study format and observed patterns in individual differences/ domestication.

It is likely that these two theories are indeed interrelated. Assumptions about ICTs may be held in patterns that result in user types. User types may be the building blocks

upon which ICT cultures are built, with the culture of any organization resulting from the interaction of various types. The similarities between the IT Cultural Patterns and the User Types suggest the validity of the User Types presented in this document. These two separate studies, done in different countries in North America and separated by two decades, emphasize that there is a critical and interesting patterned phenomenon that these theories are explaining, and lends support towards the user types having scientific validity.

*Roger's (1962) Diffusion of Innovations*

During discussions with a colleague, the researcher was asked how the User Typology was different from other theories of ICT use, most notably the theory of diffusion of innovations (Rogers, 1962; Rogers & Shoemaker, 1971). Diffusion of innovations is a theory that proposes that ideas and technologies go through a process of adoption, and specifically that individuals can be separated into predictable groups based upon how quickly (or slowly) they adopt new forms of ICTs .

Diffusion of innovations is a much larger theory of how and why ideas and technologies (including ICTs) are adopted and integrated into society. However, the most relevant part of diffusion of innovations to this study is the idea that society can be separated into five different groups of consumers who will predictably adopt an innovation at a similar time, relative to when that innovation was released (Rogers, 1962; Rogers & Shoemaker, 1971). These five groups are detailed in the table below, and are discussed across three main areas: the time of adoption, relative age of adoption, and resources available.

### 5.3 Description of the Categories of Consumers in Diffusion of Innovations Theory

<b>Categories of Consumers</b>	<b>Description of Time of Adoption</b>	<b>Relative Age</b>	<b>Resources</b>
<b>Innovators</b>	Tend to adopt an innovation early, are surrounded by other innovators	Tend to be Young	Tend to have high financial and social resources
<b>Early Adopters</b>	Tend to adopt an innovation shortly following the innovators	Tend to be Younger	Tend to have high financial and social resources
<b>Early Majority</b>	Tend to be slower in adopting new innovations than early adopters and innovators	-	Tend to have above average social status
<b>Late Majority</b>	Tend to adopt an innovation later than the majority of individuals	-	Tend to have lower financial and social resources
<b>Laggards</b>	Resist and are the last group to adopt an innovation	Tend to be Older	Tend to have low financial and social resources

As can be seen in the table above, part of the theory of innovations suggests that younger individuals tend to adopt ICTs first, making up the majority of the individuals who fall into the innovators and early adopters categories, whereas older individuals are thought to be more likely to be laggards. In addition, the earlier adoption categories tend to be more likely to have higher financial and social resources than the later adoption categories (Rogers, 1962; Rogers & Shoemaker, 1971).

The similarity between the diffusion of innovations with the theory of user types presented in this work *ends* in the fact that both diffusion of innovations and the user typology have five categories each. In order to compare how the user typology is different from diffusion of innovations, each of the five user types is described in terms of the adoption time period, relative age, and financial and social resources in the table

below to illustrate the lack of similarities between the categories of adopters and the user typology.

**Table 5.4 Description of the User Types Adoption of New ICTs, Age, and Financial and Social Resources in the study**

	<b>Adoption Time Period</b>	<b>Relative Age</b>	<b>Financial and Social Resources</b>
<b>Enthusiasts</b>	Mostly adopt new forms of ICTs early; however, some ICTs are adopted later	Older Adults	Medium financial and social resources
<b>Practicalists</b>	Mixed adoption: some new forms early, other forms later; some not at all	Older Adults	Medium social resources; medium financial resources
<b>Socializer</b>	Social forms of ICTs are sought after; “non-social” forms of ICTs not used/ rejected	Older Adults	High social resources Low to Medium/High financial resources
<b>Traditionalists</b>	Newer forms of ICTs rejected; Newer versions of older forms can be readily adopted (LCDs versus CRT televisions)	Older Adults	Medium social resources; Low to Medium Financial Resources
<b>Guardians</b>	Tend to adopt ICTs either mid or late	Older Adults	Low to Medium social resources. Low to High Financial Resources

As can be seen in the table above, *several striking differences* between the categories proposed by diffusion of innovations and the user typology are readily apparent. Firstly, the five categories of user types were discovered in older adults, a finding that runs counter to the categorization of older users as being laggards in diffusion of innovations. Secondly, the amount of financial and social resources within each type varied considerably, with individuals in this sample from low income backgrounds seen within the socializer, traditionalist, and guardian types; while individuals with medium financial resources were seen within each group. Social

resources also tended to vary considerably, without any clear patterns seen that differentiate the types, with the exception of the socializer type that tended to have the highest social resources. One Guardian (Natalie) had very few social resources, particularly when it came to family; however, several of the other guardians had large friend and community networks (Margaret and Jackie, although Jackie's friends were distributed across two countries).

Thirdly, and most importantly, the rate of adoption is not what distinguishes these five user types from each other. For instance, an enthusiast may have adopted an LCD TV when it first came out because it was a toy and new and exciting, a practicalist may have adopted an LCD TV when it first came out because it allowed them to view their favorite shows in HD, and the traditionalist may have adopted an LCD TV when it first came out because they love their television and needed a new one. Therefore, what separates these three groups is not when they adopted a new ICT, but the meaning that ICT holds in the person's life and how they view that ICT. Seeing an ICT as a "toy" is what made Alice, Fred, and Harry enthusiasts. However, that did not mean that all three enthusiasts owned the latest in smartphones (only Alice and Fred owned a smartphone, Harry did not) due to differing resources. Similarly, among the practicalists the prevailing thought of ICTs as a "tool" did not lead this group to adopt cell phones at the same time: Belinda had a smartphone, Boris had a pay-as-you-go cell phone, and Cleveland had a simple plan phone. Whereas Belinda had gotten her first cell phone less than a decade ago, Boris had a car phone that needed to be carried in a bag in the early 1990s. For the socializers, cell phones tended to be adopted as soon as younger individuals in their

social networks obtained one. For some socializers using a cell phone was impossible (such as for Nancy), however, non-social ICTs are rarely used.

As can be seen from these examples, it is not the time of adoption that determines these groupings (nor does a single group have a specific time period after an innovation is introduced in which they will adopt a new innovation), but rather the underlying beliefs and meanings attributed to ICTs that determine an individual's user type.

### **Comparison of Findings with Domestication and Gerontechnological Literature**

Whereas the previous section of this chapter examined how the user types theory fit into similar theories, the following sections of this chapter address how the findings (both of user types and other findings) fit within the existing domestication and gerontechnological literature upon which this study was built. Domestication theory was used as a theoretical lens (Creswell, 2003) for this research, which allowed different aspects of use to be recognized and examined. The broadest implication for this research on the theory of domestication lies in the recognition of distinct domestication patterns, or user types. Gerontechnological literature was used to inform the study as far as life contexts and illustrative findings on older adults, and there are several important implications to this body of literature.

The table below indicates the findings from this study and how they relate to previous findings from the domestication and gerontechnological literature and the potential implications they have for these two areas.

**Table 5.5 Findings, Previously Related Findings from Domestication and Gerontechnology, and Implications for Related Research**

Category of Findings	Summary of Findings	Previous Related Findings		Implications for Related Research	
		Domestication Research	Gerontechnology Research	Domestication Research	Gerontechnology Research
<b>Overarching findings</b>	Five distinct user types.	Findings suggesting gender differences; perhaps supportive of user types (see gender differences)	Very little research examining ICT use in depth (beyond surveys)	User types may suggest patterns in domestication	User types may be helpful way to view ICT use and explain differing ICT adoption outcomes
<b>Introduction to ICTs</b>	ICT introduction varies based upon types: enthusiasts are self-seeking or exposed through enthusiasts, practicalists through work; socializers through social networks; traditionalists through gifts (family and friends); guardians through gifts and self-purchase	Individuals are introduced to ICTs mainly through family relationships and work environments	Very little research on how older adults learn about or come to own new ICTs	May suggest patterns in how individuals are introduced to ICTs; these patterns may be related to meanings of ICTs	May explain why older adults show such diversity in terms of their ownership of devices despite similar backgrounds
<b>Use of ICTs</b>	Use varies considerably based upon type due to differences in meanings assigned to ICTs by each type: enthusiasts stretch ICTs into every area of their lives; practicalists see ICTs as serving a specific purpose; socializers view ICTs as connections; traditionalists use and love their older forms of ICTs (rejecting newer ones); guardians only use ICTs (or use them in a way) that are not harmful.	Little is known about ICT domestication by older adults; self-reports that television and telephone use increases after retirement; computers can blur the lines between leisure and work	Most literature concentrates on assistive or health devices. Limited literature in the community and work contexts	Studying use across multiple contexts leads to greater understanding of domestication patterns	Sheds light on everyday ICT use; community and work contexts are important areas to study due to their influence on many older adults' lives

Category of Findings	Summary of Findings	Previous Related Findings		Implications for Related Research	
		Domestication Research	Gerontechnology Research	Domestication Research	Gerontechnology Research
<b>Display of ICTs</b>	The placement of ICTs in the home differed based upon user types, with different types choosing different types of ICTs to be displayed (or choosing to not display ICTs at all)	ICTs are placed in the home and often form “digital hearths” replacing the traditional fireplace	Older adults prefer non-stigmatizing ICTs; very little research on the look and placement of ICTs in the home or elsewhere	Display of ICTs is not always arranged in a digital hearth for some older adults; the traditional fireplace still has its “place”	An ICT’s obtrusiveness or ability to blend into the environment has differing implications depending upon user type
<b>Meaning of ICTs</b>	Each of the various user types attributes different meanings to ICTs	Studies have shown ICTs can represent means of control; monitoring, resistance, and a show of affluence	Little to no research on meaning of ICTs to older adults	ICT meanings can be patterned among a select birth cohort	ICT meaning influences if an older adult chooses to use an ICT, how they use it, and how they display it

Category of Findings	Summary of Findings	Previous Related Findings		Implications for Related Research	
		Domestication Research	Gerontechnology Research	Domestication Research	Gerontechnology Research
<b>Societal Understanding and Choice to Use ICTs</b>	Lucky Few birth cohort members felt their needs and struggles were misunderstood by younger birth cohorts. Younger birth cohorts felt that it was a “choice” for older adults to use ICTs, however; the choice to not use an ICT often had dramatic ramifications on relationships between the older adults and younger cohorts	ICT use can be a source of conflict in intergenerational families (mainly found in studies of young children and parents)	Little to no research on how non-older adults view older adults ICT use; some research on multi-generational use between young grandchildren and grandparents	Conflicts in ICT use can expand beyond the household	Need to consider how ICT use is impacted by expectations of others surrounding the older adult; need to understand how perceived lack of societal understanding impact’s older adult’s life satisfaction
<b>Gender Differences</b>	Among this sample Guardian, Traditionalist, and Socializer user types were all women; Practicalists and Enthusiasts were mostly men	Women prefer ICTs which provide control and socialization; Men prefer functionality; Women prefer ICTs that are seen as more personal	Women tend to rate their own ICT skills lower than men	Differences between women and men may be due to different patterns of domestication (user types)	Women may have different perspectives on ICT meanings than men; which affects introduction, display, and use

Category of Findings	Summary of Findings	Previous Related Findings		Implications for Related Research	
		Domestication Research	Gerontechnology Research	Domestication Research	Gerontechnology Research
<b>Work Trajectory Findings</b>	Those working had greater access to newer forms of ICTs, technical training and help, and support compared to those who retired or stayed at home	Work is an important introductory context for individuals	Very little research on work	Work is important in introducing ICTs, but also in sustaining use through support and access	Work is critical to access, support, and exposure to new forms of ICTs; older adults in retirement may be at risk for lower exposure, support, and access
	Women who held “pink collared” positions tended to be exposed to computerized ICTs earlier than white collared or blue collared men or women or women who stayed at home	Gender roles impact exposure to ICTs in the workforce, with women less likely to be exposed to ICTs such as computers	Women report lower exposure to computerized ICTs compared to men.	Pink collared women were more likely to be exposed to ICTs through work; may be a cohort effect	Use of a work trajectory approach (life course approach in general) is important to understanding ICT use in work
<b>Income Versus Social Support</b>	The most important determining factor in older adults access to and their receiving technical support was social support; regardless of income level.	Supportive environment within the family can encourage use.	Income is often correlated with ICT ownership	Social support includes community and friend support outside of the family	Social support is critical to understanding who is successful at using and accessing ICTs beyond ownership

Category of Findings	Summary of Findings	Previous Related Findings		Implications for Related Research	
		Domestication Research	Gerontechnology Research	Domestication Research	Gerontechnology Research
<b>Physical Limitations and Device Use</b>	Physical limitations can have an impact on an older adult device use; particularly limiting if the older adult does not have access to more accessible devices because of income	No research on domestication and physical limitations	Focus on assistive devices not on existing ICTs	Domestication of ICTs can be influenced by physical limitations of user	Need for more research on existing ICT use and physical limitations; Call for a more activist approach
<b>ICT Use/ Non-Use on Life Satisfaction</b>	Individuals are satisfied if they are able to use ICTs in a way that fits with their user type's meaning of ICTs	-	Greater ICT use is suggested to improve life satisfaction	Domestication patterns which are able to be fulfilled may result in greater life satisfaction	No simple dichotomy between use and non-use and life satisfaction

*User Types in Domestication and Gerontechnology Research*

Previous work in domestication has not discovered such distinct patterns as the user types found in this study. This may be due to the design of this study compared to previous domestication studies. Firstly, domestication research has typically focused on a single or a handful of ICTs and their in-depth use (Silverstone & Hirsch, 1992). It is questionable that this study would have discovered these user types by simply examining a single ICT, such as a cell phone, given the fact that 16 out of the 17 primary participants used cell phones. At the very least, it would likely be impossible to separate and discover all five categories, given the fact that several categories have a similar relationship with the cell phone on the surface. Practicalists, traditionalists, and guardians tend to not use their cell phones very much (often leaving them off for instance), whereas enthusiasts and socializers are very connected to their cell phones and cannot live without them. However, this view of use is limited to quantity of use and not to the meaning behind the device's use.

Secondly, the research on domestication has typically focused on an in-depth analysis of the family unit and their use (Silverstone & Hirsch, 1992). Within a family, although there can be mixed types within romantic relationships (for instance, the traditionalist Mindy Jean and the practicalist George; the socializer Mary and the practicalist Cleveland), there can also be two individuals of a similar type (the enthusiasts Alice and Fred). Therefore, it is possible that these previous studies examined families of similar user types (within each family unit).

Within the gerontechnological research, there is little research that has focused on understanding older adult's ICT use of common everyday ICTs (as opposed to health or

assistive ICTs). Most of the studies that do focus on a wide range of ICTs do so through survey research. From survey research, while we know that there is a great diversity in the use of certain ICTs among older adults in terms of device ownership (Adler, 1996; Eastman & Iyer, 2004; Gilly & Zeithaml, 1985; Iyer & Eastman, 2006), we know little about actual use and meanings. These user types may be useful to furthering studies of ICT use by older adults.

#### *Introduction of ICTs in Domestication and Gerontechnological Research*

Domestication research has previously explored the home as the main context of ICT domestication (Silverstone & Haddon, 1996; Silverstone & Hirsch, 1992). Not surprisingly, family members are considered to be important sources of introduction of ICTs into the home and between individuals in the family (Silverstone, 1999). Other research has examined work and its role in introduction (Buse, 2009; Habib & Cornford, 2002), although this is an area that remains underexplored in the domestication literature (Lie & Sørensen, 1996). This study has shown that not only are individuals introduced to ICTs in diverse contexts, including family and work, but also community and leisure.

Beyond the diversity of these contexts in introducing older adults to ICTs, a significant finding in this study was that individuals could be separated into user types based upon how they were introduced to ICTs. For instance, enthusiasts tend to self-purchasers of ICTs, but also are introduced to ICTs through close friendships and family relationships with other enthusiasts. Since ICTs are so central to the enthusiast's daily experience, they seek out friendships and other relationships based upon their love of ICTs with other enthusiasts. Practicalists tend to be most exposed to ICTs through their work and family lives (most notably through work), while socializers are exposed to ICTs

mainly through their large intergenerational networks of family, friends, and community members. Traditionalists mainly receive newer forms of ICTs as gifts from friends and family members; whereas guardians tend to be self-purchasers and receivers of ICT gifts from family (and occasionally friends).

Domestication literature has previously asserted that family relationships are the most important in introducing ICTs into individual's lives (Stewart, 2007). The vast majority of domestication studies have focused on the home environment through case studies of families who live together (see for example Stewart (2007) and Hirsh (1994)). Therefore, the family is often conceptualized in the literature as the people whom live with one another. This is particularly logical when understanding ICT use in families with young children or when studying young children themselves.

In the case of this study, the older adults took a much broader view of family, tending to define family as close relationships that were genetic, formally adopted, or romantic partnerships. The vast majority of individuals that older adults considered family did not live directly with them. These included grown children, grandchildren, cousins, nieces/nephews, sisters/brothers, and in some cases, mothers and fathers (if still living), and romantic partners. The differences between the definition of family in previous domestication research and this study must be explored through further research, as it is unclear how a wider definition of family (including those who are not living with each other) could influence the introduction and use of ICTs.<sup>13</sup>

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<sup>13</sup> This wider self-definition of family and home is keeping in spirit with Silverstone (1999), who suggests that the home expands beyond the physical confines of a dwelling to the sense of belongingness that an individual feels with certain people. Therefore the family (and by extension, a person's home) is defined by those individuals whom a person feels that they belong to and with. Conceptually, the definition by older adults as to what constitutes family makes sense. When individuals grow older, it is unlikely that they would stop considering their children as family members although they may have moved out of the older adults' home. It is unclear if in previous domestication studies the researchers allowed individuals to "self-

This study confirms previous domestication findings suggesting the importance of family in introducing individuals to ICTs. However, it also suggests that the family context is much more important to certain user types than others. For instance, family relationships are critically important to introducing traditionalists to new ICT devices (as this is the one major way that traditionalists are introduced to new forms of ICTs), but are also very important to socializers (who are also introduced to ICTs through friends and community members). Therefore, it is important for future domestication research to explore how these other contexts (work, community, and leisure) influence ICT introduction, as not all the types were primarily introduced through family relationships to new ICTs.

While work has been explored as a context of introduction in domestication studies, most of this research has focused on how working adults physically bring ICTs into the home environment because of exposure in their working lives (Buse, 2009). This study showed that work is particularly important to the practicalists to introduce them to new forms of ICTs. However, not all the types are influenced in their use so readily by work. In some cases, such as Alice, the participant drew ICTs into her work by introducing ICTs she was using in other aspects of her personal life (leisure, community, and family) into her work as a home health care nurse. This phenomenon has not been discussed in the domestication literature before. It is important to recognize that participants are not strictly exposed to ICTs through these contexts in a passive way, but they themselves are important active actors in bringing these ICTs into contexts. This

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define” who they considered their family members (like the researcher did in this study) or assumed that the family unit was those individuals whom lived together. It is therefore difficult to tell if the wider definition of family by the older adults in this study is due to such self-definition or differences between how younger and older individuals define their family.

active technological “stretching” of ICT devices across contexts is particularly true of enthusiasts. It is important to consider in future domestication studies that not only do individuals experience ICTs in various contexts, but they are active participants in spreading these ICTs to other contexts in their lives that are important to them.

Within the gerontechnological literature, there has been very little research on how older adults are introduced to new ICT forms. This is due in part to the fact that most gerontechnological literature focuses on the creation and testing of assistive devices (existing or new) and how they can be used to help older adults with cognitive or physical disabilities or issues (Birkland & Kaarst-Brown, 2010, 2011). In the case of assistive devices, most older adults are introduced to these ICT forms through healthcare relationships and contexts, leaving little mystery to how they were first introduced. From previous surveys, we do know that there are vast differences in ownership of ICTs between older adults, with some older adults owning many devices and some owning very few (Eastman & Iyer, 2004; Iyer & Eastman, 2006; Reisenwitz, et al., 2007). In some cases, this split between older adults in terms of ownership has been called the divide between those that “have” ICTs and those that “don’t want” ICTs (Russell, 1998). As has been shown in this study, the divide between the “have” and the “don’t want” is much more complicated, with older adults having diverse experiences in how they are first introduced to ICTs dependent on their user type. These user types may help to explain why this diversity in ownership is so prevalent among older adults.

#### *Use of ICTs in Domestication and Gerontechnology Research*

This study found that each of the user types differed in how they used ICTs. For the enthusiast, ICT use was seen across all life contexts (family, work, leisure, and

community), whereas the practicalist tends to see an ICT's use as context specific and only appropriate in one or two contexts. Socializers tend to only be interested in using those ICTs which they view as social and connecting them to others in their family, leisure, and community lives, whereas for the guardian, ICTs were used very carefully to avoid misuse. Traditionalists use more traditional, older forms of ICTs across all aspects of their lives, but tend to avoid newer forms of ICTs.

In the previous domestication research, such distinct user patterns have not been discovered. Only two studies previous to this work examined ICT use by older adults. Older adults tended to report that their use of ICTs differed between when they were working and after they had retired (Haddon, 2000). Among couples where older adults were still working, retired, or had one spouse working and one retired, computers often brought work into the home and created conflict (Buse, 2009).

Interestingly enough, differences in ICT use before and after retirement did not emerge from this study, despite having a mix of older adults who were retired and working. For instance, among the practicalists, Cleveland and Jack were officially retired with no intentions of rejoining the work force, while Dan was temporarily retired. Boris, Belinda, and George were working. All practicalists, despite these differences in their current working status, shared similar views about ICTs being for practical, defined, and context-specific purposes. The only differences that emerged from the study between the retired and the non-retired individuals is that for many retired individuals, they mourned the loss of easy access to ICTs and the support and training they received in the work environment (which will be discussed later in this chapter).

The conflict observed in Buse's (2009) study over the use of computers bringing work into the home was also not observed in this study. This was despite the fact that many of the participants in the study did use ICTs extensively at home for work purposes, including Boris (who worked out of his home), Fred, Alice, and Belinda. It is possible that the conflict observed in Buse's study was due not only to the potential to bring work into the home, but also in due to conflicting user types who had differences in opinions in how ICTs should be used. For instance, Fred and Alice often worked side by side (on separate laptops) on their projects without complaint. This was most likely due to the fact that both of these individuals, as enthusiasts, viewed ICTs similarly, as great toys. In fact, they saw their sharing of ICT devices and knowledge about them as bringing them closer together. In the case of Boris, who lived with his wife (interviewed as a secondary participant for this study), he viewed the computer predominately as a work device. As a practicalist, Boris tended to not allow his use of the computer to "spread" to other areas of his life, as he saw the computer as a work tool. Therefore, his use was limited only to work, and did not affect his leisure time with his wife.

One could see how conflict could play out between types that are extremely different in their viewpoints and how this could cause conflict: Margaret (a guardian) had her live-in partner (type unclear- but possibly a traditionalist) watch "his mindless" television in a spare bedroom with the door closed; Mindy Jean (a traditionalist) made her husband, George (a practicalist) keep his computerized ICTs out of sight. In the case of Mindy Jean and George, George often criticized Mindy Jean's reliance on traditional media forms (such as television and radio news) as "stupid," whereas Mindy Jean often

criticized George's reliance on the computer for his news as "dumb."<sup>14</sup> Therefore, user types may be an interesting lens through which to view conflict between individuals over ICT use, particularly for understanding why some couples or families may experience differing levels of conflict. It is possible that some user types are far more likely to "mesh" and create lower levels of conflict, while other user types if combined are more likely to create conflict. This type of conflict among user types may also be evident among younger adults, as evidenced by Kaarst-Brown's (1995) *IT Cultural Patterns*.

The differences in the user types, when exploring ICT use, is readily apparent in how these older adults view ICT use in each context. For instance, enthusiasts, practicalists, and traditionalists tend to all watch television in their leisure lives (with some guardians and socializers also being TV watchers). However, what separates these types is readily apparent if one examines how they use television in their everyday lives across family, leisure, community, and work. For the enthusiast, their love of ICTs makes them use television across all their life contexts; for the practicalists' television is only seen as a leisure and family device for entertainment; and for the traditionalists' television is one of their beloved activities which is integrated into every aspect of their life because they are comfortable with older forms of ICTs. Although all three types watch television, it is not until one examines the television's use across these contexts that the differences in ICT use between the types is readily apparent. Therefore, further

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<sup>14</sup> Although there was conflict between George and Mindy Jean over their respective ICT use, it was clear from their discussions that most of this was said in lighthearted jest, with some serious undertones. For instance, George was mildly disturbed that Mindy Jean liked to watch TV so much, and he really did think that much of what she chose to watch was mindless, such as soap operas. However, he did not believe that his wife was stupid for using these things, nor was it a point of contention between the two of them. Similarly, Mindy Jean would complain about how George relied on the computer, but it was clear her main problem was with the ICT itself, and not really with any fundamental issue with George or their relationship. A mismatch for their ICT use types was not a deal breaker for their marriage.

domestication studies may benefit from not only exploring a multitude of ICTs but a multitude of life contexts that make up an individual's (or a family's) everyday life.

The gerontechnological literature has rarely studied older adults' ICT use. Some contexts are vastly understudied, despite many researchers calling for the conduct of such studies (van Bronswijk, et al., 2002; van Bronswijk, et al., 2009) and evidence that leisure (Howe, 1987), community (Choi, Burr, Mutchler, & Caro, 2007), and work (Hedge, et al., 2006) are critical areas of older adults' everyday lives. The findings of this study suggest that older adults have distinct ICT user patterns based upon user type. The user typology may be useful in understanding how older adults are using various ICTs in differing life contexts, including who may benefit from ICTs being used in a context and who may be at risk of being disenfranchised by ICT use in a context. For example, enthusiasts are the most likely to benefit (and even enjoy) electronic voting; traditionalists are the most likely to be excluded from democratic participation when it comes to electronic voting. Therefore, these user types and the finding that user types influence ICT use could be a helpful way to explore use in further gerontechnological studies.

#### *Display of ICTs in Domestication and Gerontechnology Research*

This study found that different user types chose to display their ICTs differently. For the enthusiasts, much of their life focused on the ICTs which were scattered and proudly displayed throughout their homes. The practicalist tends to keep ICTs in specified places designed for specific ICT use. The socializer keeps their communication devices close, preferring portable devices which allowed them to go about their day and keep in touch with everyone. The traditionalist displays their older forms of ICTs

throughout their home, while newer forms are hidden. The guardian prefers to hide most forms of ICTs, and keep them out of their main living areas as much as possible.

Previous domestication studies have examined how ICTs have often replaced other features in our homes, and the display of such devices is attached to the prominence such devices have in owner's everyday lives. For instance, Flynn (2003) notes that the television has often taken the place of the traditional hearth in the home, with furniture surrounding the television as the focal point of the home, much like a digital hearth. The television was certainly the "digital hearth" in the homes of the enthusiasts and traditionalists, with much of their activity centered around the television. The television was also (to a certain extent) the digital hearth in whatever room the practicalist used for television watching. For the guardian and the socializer, televisions tended to not take prominence in their lives. For the guardian, in particular, the ideal place for the television (and most ICTs) was hidden in spaces that are not typically used and not easily seen upon entering the home. This reflects what Flynn noted as the diversity in how individuals chose to integrate ICTs into their homes.

Although the example above, and Flynn's (2003) work concentrates on television, these different viewpoints of the display of ICTs expressed by the various user types were consistent across ICTs. This suggests that the meaning of these ICTs was reflected in their display. For the enthusiast, their ICTs are an integral and important feature of their everyday life and therefore are displayed proudly in the center of every room, forming ICT hearths within every room in their home (the only exception being the bathroom). For the guardian, it is important to avoid placing ICTs in such a way to create a digital hearth in their home, and they pride themselves on having ICT-free areas where there are

other “non-technological hearths,” be they a traditional fireplace or a seating arrangement. For the traditionalist, they focus on having many digital hearths of older forms of ICTs throughout their home while they hide newer ICTs out of site. Further domestication studies which are interested in display of ICTs may find that the user typology is helpful in determining why there is diversity in the placement of ICTs throughout the home.

Gerontechnology has rarely examined the display of ICTs by older adults, except that we know that older adults will not use assistive ICTs that are stigmatizing (Sokoler & Svensson, 2007). Therefore, the findings in this study suggest that older adults (based upon their user types) may have a preference for a device that is attention getting and eye catching (such as the enthusiast) or have a preference for a device which is un-obtrusive and blends into the environment (such as the guardian). It is important to note that several participants reported uncomfortable feelings at not being able to arrange their ICTs in their preferred manner. Jackie had to live with her computer and other electronic devices in her bedroom as she was packing up her apartment to live in a travel trailer. Natalie also had her television and computer in her bedroom/kitchen, as her hoarding activities had made it impossible to find other places for her ICT devices in her home. Therefore, it is important for gerontechnological researchers to note that the display of these ICTs in their homes is not just a personal choice of little consequence, but can be critically important to the happiness of the older adult and their comfort in their own home.

Given the importance that participants gave in this study to being able to place ICTs in the arrangement they preferred, it will be important to understand more fully how an ICT’s design impacts placement in the home by various types of older adult users.

Since many of the devices that gerontechnologists research have health implications, understanding the importance of how design impacts potential placement (and in turn how this placement impacts use or non-use) will be critical to designing devices that will be used by older adults.

### *Meaning of ICTs in Domestication and Gerontechnology Research*

In this study it was determined that each user type views ICTs differently, assigning different meanings to the ICT devices in their everyday lives. For instance, for the enthusiast they are toys, to the practicalist they are tools, to the socializers they are connectors, to the traditionalist they are seen as desirable or undesirable depending upon the ICT's relative age, and for the guardian they are devices with potentially negative implications for society.

Domestication research has previously explored meaning of ICTs in depth, finding that different cultures, sub-cultures, and generations can assign different meanings to the same ICT. For instance, the Amish tend to see the telephone as a device which separates individuals (putting distance between them) instead of a device which connects individuals (making the distance between them less) like the majority of the U.S. population (Umble, 1994). Cell phones can be viewed as forms of defiance by Palestinian teenage girls, who use them to defy their parents' wishes for them to not date (Hijazi-Omari & Ribak, 2008). In the case of these cultural or generational comparisons, user types could be masked by larger and more salient phenomenon seen as differences between these cultures or generational groups. These differences in meanings of the same ICT device (such as the telephone or cell phone) indicate that the meaning is not

contained in the device itself, but rather is created by the individuals who are users or non-users of the device (Silverstone & Haddon, 1996).

The differences in meaning between the user types found in this study emerged despite producer's attempts to set an ICT devices' meaning in the public sphere (Hubak, 1996; Silverstone, 1994). For some types, their meanings are in line with what producers may desire their consumers to visualize and assign meaning to their devices. However, the meanings held by certain types are in fact contrary to the goals of producers of these ICT devices. For instance, to the enthusiast the cell phone is a "fun toy," to the practicalist it is a "useful tool," and to the socializer it is a "connector to others." While all three of these meanings can be seen as meanings that producers would like potential customers to think of when they visualize a cell phone, there are also individuals who hold more negative connotations towards the cell phone. For traditionalists, cell phones simply are not as "good" as landlines and for the guardians, cell phones are devices that can "isolate" individuals and allow them to wallow in negative traits. Therefore, this study emphasizes that the meaning of an ICT is not set by the producer of the ICT or by general society, but is set by the individual in their everyday interactions.

Within the gerontechnology literature there is next to no work on the meaning of ICTs to older adults. Given the fact that older adults display such wide ranging purchasing habits and ownership of ICT devices (Adler, 1996; Ahn, et al., 2008; Czaja, et al., 2006; Eastman & Iyer, 2004; Gatto & Tak, 2008; Gilly & Zeithaml, 1985), this lack of literature examining older adults' perspectives on ICTs is quite alarming. Since income, education, and many other demographic characteristics have failed to explain these differences (see for example Gilly and Zeithaml (1985) and Zeithaml and Gilly

(1987)), it is likely that the underlying meaning of these ICTs may be what is impacting these older adults.

### *Societal Understanding and Choice to Use ICTs*

Originally, this work set out to examine other birth cohorts' (in particular, younger birth cohorts') expectations of ICT use by the Lucky Few. While conceptually this is what was examined, what emerged from these questions about expectations was *less about what ICTs an older adult should be using, but more about the consequences of not using such ICTs*. For instance, very few secondary participants stated that older adults *should* be using any certain ICT, however; many of the secondary participants felt that an older adult who chose not to use certain ICTs was more likely to feel isolated and that this choice could impact their relationships.

Most literature in the study of domestication of ICTs has not examined inter-generational expectations on ICT use, and those that have examined inter-generational use have mainly focused on families who cohabit (parents and their children under the age of 18). Much of this prior research has focused on the conflict between parents (who often want to limit their children's ICT use) and children (who often want to push the ICT use rules of the household) (Habib & Cornford, 2002). Essentially, one can view this body of literature as children often wanting to be more technologically involved than their parents wish them to be. However, these studies have not examined the ICT use of the parents, centering more on the parents' regulation of the children's use in the relationship. Therefore, little is known about how children influence their parents' use in the same relationship. One study suggested that in male family relationships (father and

son), fathers often felt their authority was threatened by their male child's technological superiority when it came to computers (Ribak, 2001).

These previous domestication studies suggest that conflict often occurs in inter-generational relationships when it comes to ICT use. In this study, there were mild suggestions of conflict between younger birth cohorts and the Lucky Few; however, most of the conflict was not angry or negative conflict, but rather frustration and in some cases sadness. Many of the secondary participants from younger birth cohorts expressed sadness or mild frustration over how ICTs were used in relationships with older adults; often stating that it would be more convenient for them, and/or they could have a different (often deeper) relationship with the member of the Lucky Few birth cohort, if the Lucky Few birth cohort person would only text, answer their cell phone, or use email. In some cases, there was a feeling of extreme loss of a better relationship that could be if the other person only used an ICT. Julie's discussion of her attempts to get her mother to use a computer and how her mother's resistance to using a computer illustrates this.

While many of the secondary participants from younger birth cohorts presented ICT use as a "choice," it is clear that a member of the Lucky Few choosing not to use a certain ICT was viewed negatively. This in turn led many of the primary participants to comment on what they believed was a lack of societal understanding for their struggles and in some ways a lack of respect for their choices. Although most of the Lucky Few commented on these struggles and spoke about the societal misunderstanding and frustration they experienced, none of the Lucky Few said that they would change their habits or ICT use as long as they had a choice to continue with their current use or non-use. Therefore, these individuals *were not swayed* by their social networks or society's

pressure to use an ICT or use an ICT in a certain way. However; all of these individuals worried about a future in which they would not have the choice to use or not use an ICT (such as Margaret's concern). Combined with society's lack of sympathy, many of these individuals worried about how they would keep up or survive in a more technological-heavy world.

Within the gerontechnological literature, almost no research has expressed expectations of older adults ICT use and how these expectations impact older adults' everyday lives. Given the fact that these expectations and concerns arose so readily in this study, it is obvious that they impact older adults. The fears about an increasingly technological society that many older adults in this study expressed will be important to address in future gerontechnological studies.

#### *Gender Roles and ICT Use*

Previous domestication studies have suggested gender differences in views on ICTs, with several notable findings consistent with the user types found in this study, but also a few important differences. Livingstone (1994) found that women tended to prefer ICTs that gave them control over their lives and time (such as recording devices) and allowed them to socialize, whereas men preferred ICTs that they viewed as functional and allowed them to escape from social situations. The focus on functionality is similar to the view of the practicalists in this study, who were overwhelmingly male. It is possible that in Livingstone's study no female participants with similar focuses on functionality were observed, suggesting a gender role effect. The preference of women in Livingstone's study for ICTs that allow for sociality is reflective of the socializer user type (in this study, all socializers were women) and also the control aspect was reflected

in the guardian user type who valued ICTs which they felt gave greater freedom to their life but did not damage society (all guardians observed in this study were women). Therefore, it is quite possible that the gender roles impacts that Livingstone observed were actually user types, as user types themselves could be gendered or be predominated by either males or females (see the final chapter for a discussion on researching the possibility of gendered types).

Singh's (2001) study indicated that women tended to use ICTs they saw as more personal over less personal ICTs. This could also be reflective of user types. For example, the Guardian tends to view face-to-face communications as being the most personal; the Traditionalist views the traditional landline phone, television, and radio as being more personal; whereas the practicalist views each ICT as having a specific purpose (and therefore differing in their appropriateness for personal interaction). The existence of these user types could explain why Singh observed such a high amount of diversity in what women in her study found to be personal; as each of the five types differs on their judgment of what is seen as most personal due to the differing meanings that each of these five types give to similar ICTs.

Within the gerontechnological literature, most studies that have examined gender roles have found it to be an emerging variable. Gender differences are not typically something which researchers set out to study initially. Several studies have found that women were more hesitant and anxious to learn to use computers than men (Charness, et al., 1992), and that women tended to under report their computer skills compared to men (Marquié, et al., 2002). There are also numerous survey studies which have shown that women report lower rates of ownership of many ICTs, including cell phones and

computers, than men (Eastman & Iyer, 2004; Iyer & Eastman, 2006; Morrell, Mayhorn, & Bennett, 2000; Reisenwitz, et al., 2007).

These gerontechnological findings regarding gender may be indicative of the possibility of gendered types. Traditionalists, socializers, and guardians were all women. In the case of guardians and traditionalists, both types tended to be less exposed to newer forms of ICTs by choice, and therefore would be more likely to report lower skills in using a device. When compared to the practicalist, socializer, and enthusiast women, most guardians and traditionalists reported more anxiety when using to learn a new device. For the guardians, most of this was focused on their concern that by using the new device they could be “sucked into” using the device in an inappropriate way or that by using the device they could be contributing to the moral decay of our society. For instance, Margaret feared the introduction of computers to her workplace not so much because she was afraid she could not learn to use the computer, but because she recognized that the computer meant that her office would likely become more depersonalized.

In the case of the traditionalists, this anxiety tended to be prompted by a lack of skills. Although both traditionalists reported anxiety over the possibility of being forced to use a newer form of an ICT, they both used their advanced coping strategies to alleviate this anxiety: having a spouse or family member undertake the task. Therefore, most of the potential anxiety that Traditionalists reported was alleviated by others who undertook tasks using new forms of ICTs.

The previous gerontechnological research findings which suggest that women are more likely to report anxiety and lower computer skills when using ICTs may therefore

be reflective of these women studied being predominately traditionalist and guardian user types. Further work in domestication and gerontechnology must address whether user types are gendered.

### *Work Trajectory Findings*

Two significant findings regarding work trajectory were identified through this study. The first was that those individuals who were still working reported greater access to newer forms of ICTs, training, and social support than those who were retired. The second was that women who had traditionally “pink collared” jobs were exposed to computers much earlier than men or women in white collar professions.

In the domestication literature, most of the research on work has focused on how work brings ICTs into the home and affects family life (Buse, 2009), but very little on how retirement or the lack of work (for instance, unemployment) impacts this phenomenon. There are several explanations for these discrepancies. First, because domestication has been so focused on the home and family use (particularly studying families with young children), retirees have not been a large part of their studies. Among the few studies that examined retirees’ usage (Buse, 2009; Haddon, 2000), retirees have not been compared to those who are still working. Secondly, these studies of retirees focused on how use changed following retirement, without exploring how the entire domestication process changed in retirement. Only through exploring the entire domestication process, including the introduction, use, display, and meanings of ICTs did these differences between retirees and those still working emerge in this study.

Additionally, the little literature on work and domestication found that men were more likely to bring computers into the home than women from their work (Habib &

Cornford, 2002), which runs contradictory to this study's finding that pink collared women were exposed to computers sooner than white collared men. One possible explanation for these gender differences is the nature of pink and white collared work. When thinking of pink collared positions compared to white collared positions, individuals in pink collared positions may be less likely to be able to afford the newest forms of ICTs for self purchase than white collared workers. Considering that many of these previous domestication studies took place in the late 1980s and early 1990s, the high cost of computers may have been prohibitive to pink collared workers at the time. Secondly, pink collared workers would be far less likely to be sent home with a work-provided ICT than white collared workers, as white collared workers are often required or expected to do work at home. Finally, it is unclear the types of work held by many of the women in these studies and if it was traditional pink collared jobs and if this may have influenced the women's exposure.

Gerontechnological studies have largely ignored the work setting beyond exploring ICT training of older adults (see for example Larwood, et al. (2001) and Larwood et al. (1997)). When considering those who need to be trained to use ICTs in their daily work is indeed necessary, it is also important to consider those who are leaving the working environment (due to retirement or for other reasons), and the impact this has on their access, ability to receive training, and coworker support in using new forms or versions of ICTs. This study found that older adults who are retired often find that they lack the access, technical training, and coworker support they had while working. These retirees (particularly retirees with lower levels of social support, as addressed later in this chapter) may be at greater risk of being disenfranchised than older adults who are still

working. The differences observed between occupation type (white or pink collar) also call for gerontechnological studies to take a wider perspective on issues such as work, and in particular to take a life course perspective. The women and men in this study each had vastly different work trajectories throughout life which shaped their ICT use (particularly when it came to early exposure and learning basic skills) far more than their current work status. Both domestication and gerontechnological studies of ICT use by older adults could benefit from taking more of a life course perspective, including considering how the older adult's work trajectories shaped and continue to shape ICT domestication and access.

#### *Income versus Social Support*

Very little research in either domestication or gerontechnology has examined the role of social support in older adults' ICT use. Limited research within domestication has shown that a supportive family environment within the home is critical and helpful for those learning a new ICT and non-supportive environments tend to be detrimental (Aune, 1996). However, very little research has looked at supportive individuals outside of the context of immediate family members. This is particularly surprising in gerontechnology, given how often the family context is emphasized as being important to older adults (see for example Angel (1999) and Geron, Andrews, & Kuhn (2005)).

In the case of this study, it was found that social support was much more important to older adults' success and access in using an ICT than income. Many of the higher income older adults who lacked a good support network struggled with new devices and with technical issues. For the most impoverished older adults in this study (most notably Gwen, Jackie, and June), the key to being successful in their ICT use was

their social networks. For Gwen and June, their large family and friend networks (and in the case of Gwen, community network as well) provided not only the ICTs themselves (saving them from purchasing them on their limited incomes) but also technical help and training. In the case of Jackie, her use of commercially available support programs helped to fill the fact that her social network was widely dispersed and unable to help her with many of her technical issues. In other cases, even a high income (such as Natalie's) did not sufficiently overcome the problems she faced because she lacked a strong social support network that could provide her with technical support and help.

Future research needs to delve much more deeply into understanding the connections and influence of social support and income. Oftentimes low income older adults are presented as the individuals who are most "at risk" for technological exclusion (Millward, 2003). However, the influence of social support on these individual's access has not been addressed. Identifying those adults who are both low income (and unable to procure devices, help, and services on their own) and have small or no social networks (and unable to procure devices, help, and services through others) may more accurately predict those older adults who are at greatest risk of the digital divide than current surveys of ICT ownership.

#### *Physical Limitations on Device Use*

The researcher could find no research on individuals with disabilities or impairments and how they domesticated their ICT devices, suggesting an interesting area of future study. Most of the literature in gerontechnology focuses on adapting or creating ICT devices to make them usable for older adults with impairments or disabilities (Bouwhuis, 2006; van Bronswijk, et al., 2002; van Bronswijk, et al., 2009). For instance,

there are a plethora of studies on assistive smart wheel chairs and walkers (Fioretti, Leo, & Longhi, 2000; Jia, Hu, Lu, & Yuan, 2007), monitoring systems (Ahamed, Haque, Stamm, & Khan, 2007; Alwan, et al., 2006; Arcelus, Jones, Goubran, & Knoefel, 2007), and adapting devices for those with low vision or hearing difficulties (Harrison, 2004; Hernández-Encuentra, Pousada, & Gómez-Zúñiga, 2009; Poll & Waterham, 1995). However, very little of that literature examines older adults' struggles and challenges with existing devices. Although these studies of adaptations are worthy, very little research and effort within the gerontechnology research community has focused on how to make existing devices more accessible, and in particular, how to make government provided devices more accessible.

One of the most critical findings of this study was the government provided cell phones given to many of the low income older adults in this study were extremely small. Since this is a government-provided service meant to help low income individuals to stay connected to vital services and with society in general, it does not make logical sense that individuals with impairments (such as sight or dexterity impairments) would be provided with a phone that was so difficult to see or manipulate because of its size. It is well known in the gerontechnological research community (as well as the general geriatric and gerontology communities) that devices must have larger buttons with larger numbers for older adults with even average dexterity and vision (Hernández-Encuentra, et al., 2009). Both vision and dexterity decline later in life, with even adults in their thirties requiring more light or larger letters/numbers to read effectively (Kosnik, Winslow, Kline, Rasinski, & Sekuler, 1998). For those with disabilities such as severe arthritis and low vision, smaller buttons on devices are even more problematic.

For researchers in both domestication and gerontechnology, understanding how older adults interact or conversely do not interact with devices that are difficult to use is critical to understanding the challenges these individuals face. This is particularly true when considering government-provided ICTs for low income individuals, who may have little choice but to either use those devices provided by the government or not have access to such a device (such as in Nancy's case). One of gerontechnology's often stated goals is to support older adults in living as independently as possible and to have high quality lives (van Bronswijk, et al., 2002). Being able to use basic communication devices (if the individual so chooses) like the cell phone is crucial in establishing an inclusive society. By providing ICTs that are accessible and exerting pressure on such government programs to provide accessible devices, researchers can promote ICT sovereignty in older adults by enabling them to be able to choose which ICTs they would like to use, regardless of any impairment or disability. Future research and activity on the part of gerontechnologists must not only be on developing these accessible devices, but ensuring that those who desire and need them are able to access them.

#### *Life Satisfaction and ICT Use*

One of the original questions of this research was how ICT use impacted life satisfaction. It is often supposed in the gerontechnological literature that increased use of ICTs leads to greater life satisfaction (van Bronswijk, et al., 2002), while most domestication literature does not deal with the impact of ICTs on life satisfaction. What this study encountered, however, is that it was not that ICTs created or allowed greater life satisfaction. Rather an individual having sovereignty (choices) in using those ICTs

they wished and not being forced to use those ICTs that they did not wish to use resulted in greater life satisfaction.

Those who used the fewest modern ICTs in this study (the traditionalists) and those who used ICTs in the most controlled ways (the guardians) were all as much satisfied with their lifestyle as those who were prolific ICT users (the enthusiasts and the socializers, and often many practicalists). However, where life satisfaction seemed to decrease is when a user could not match his or her ideal domestication pattern to what was actually happening in their daily lives. For instance, both Jackie and Natalie were quite upset that their living arrangements meant that they lived intimately with their ICTs close to where they slept. For both of these guardians, they felt that having more space in which to place their ICTs would have been a much better living situation. Placing their ICTs elsewhere could have made them much happier and content. In the case of Jackie, she was limited by her financial situation as she was boxing up and selling off her and her former husband's items as she was no longer able to afford her apartment and would instead live in a pop-up trailer. In the case of Natalie, her hoarding activities had made most of her house inaccessible and she was limited to her kitchen/den area to live in. For both of these women, being able to place their ICTs in another separate room (much like Margaret's den) would have been ideal.

In the case of Nancy, she was quite happy with her current ICT use but wanted to learn to text in order to stay in touch with several young people she knew. In her case, her financial limitations meant that the only phone she qualified for was a government provided cell phone. The model she had been sent had been excruciatingly small (see chapter 4) and combined with her arthritis and visual difficulties, she could not use it. For

Nancy, not being able to learn to text was quite frustrating and she bemoaned the fact that these devices were not made for older people or younger people with disabilities. Nancy was not able to use the cell phone in the way that her type (as a socializer) idealized, much like Jackie and Natalie were not able to display their computers and other ICTs in the way that their type (guardian) idealized.

For all of these women, these were points of mild frustration. However, each of the women seemed very satisfied with her overall daily life. Other than Natalie, all of the participants in the study were quite happy not only in their daily routines but in their everyday life.<sup>15</sup> It is quite possible that a far deviation from these individuals' idealized domestication patterns would result in lessened life satisfaction. For instance, a traditionalist who is forced to use a computer daily and intimately for their personal or work life or an enthusiast who can no longer afford or have access to their devices most likely would report a decrease in life satisfaction because they are no longer able to act with ICTs in the way that they idealize as best.

The key to life satisfaction regarding ICT use is not that there is any ideal "amount" of ICT use for an older adult, but that the older adult prefers (like all people) to be able to live their life with the sovereignty to choose what they will use, how they will use it, and where it will be placed in their home. In making this choice, an older adult is influenced by their user type, with each user type having an idealized domestication pattern due to the meanings each of these user types gives to ICTs. Allowing older adults

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<sup>15</sup> Over the course of the study I was at times concerned about Natalie's mental health. At times, she could be quite sad and lonely. I believe that she was suffering from mild depression that contributed to her hoarding activities. This was extremely understandable given her non-existent relationship with her child and grandchild as well as other life events that she experienced. However, Natalie also had many bright spots in her life, including visiting her horse Milkshake (pseudonym) daily, completing crafting projects, and visiting with the few friends she had on a regular basis. Her home, while very cluttered, was not dirty nor was there garbage present. She was always clean and appropriately dressed for our appointments and she was at most times extremely pleasant and helpful.

the freedom to be able to use ICTs they wish (and conversely not use the ICTs they do not wish to) would appear to impact life satisfaction. However, this is something which must be much more deeply explored in future studies. In addition, researchers should explore ways that they can enable individuals who are unable to live and interact with ICTs in the ways their type desires can be accommodated. For instance, an enthusiast's idealized ICT environment in an institutionalized care setting would be quite different from a traditionalist. If life satisfaction is related to sovereignty in choosing to use ICTs according to a user type's idealized vision, then enabling these diverse patterns of use and non-use will be critical in helping older adults to live enriching lives.

The following sections of this chapter focus on the methodological insights for future research and the societal implications from the findings of this study.

### **Methodological Insights from this Study to Future Domestication and Gerontechnological Research**

This study proposes several major methodological contributions to the areas of gerontechnological and domestication research. Whereas the previous sections of this chapter concentrated on the implications of the findings in terms of the existing literature on older adults and ICT use from both areas, this section of the chapter focuses more broadly on how the major contributions as far as method, findings, and technique impact researchers who are working in these two areas. (These areas of contributions were briefly outlined in Chapter 2). The implications identified are seen as those that would have the most impact on the decisions that researchers would make in designing a potential study. The table below briefly outlines each of these implications with the contributions themselves.

**Table 5.6 Study Contributions and Future Domestication and Gerontechnological Study Implications**

<b>Study Contributions</b>	<b>Domestication Study Implications</b>	<b>Gerontechnological Study Implications</b>
<b>User Types</b>	Domestication is a useful lens to understand the use of ICTs in older adults; Differences in domestication processes can be due to user types	Proves diversity in desire and goals for ICT use among older adults; Suggests that user types to explore ICT use and acceptance by older adults may be a fruitful way to understand adoption of gerontechnological ICTs
<b>Expansion of literature into the Work, Leisure, and Community Life Contexts</b>	Domestication theory can be applied not only to home context but also to ICT use in all life contexts; All life contexts can impact domestication; however, for some certain life contexts are more important than others; User types might not emerge unless studying multiple life contexts	Work trajectory and occupation/position type are important factors to consider in older adult ICT exposure; Considering all life contexts provides the researcher with a more accurate view of actual ICT use Domestication is a useful theory for exploring older adult ICT use (particularly when exploring multiple contexts)
<b>Multiple ICT perspective</b>	Study of multiple ICTs sheds light on patterns of domestication (user types)	ICT use is interwoven into older adults' lives; difficult to understand patterns of ICT use and adoption (user types) by studying a single ICT
<b>Single Birth Cohort Study</b>	Expands domestication literature on older adults to be conscious of possible birth-cohort effects	Demonstrates the power of a birth-cohort perspective on studying older adults and isolating possible intervening variables (such as changes in work and educational environments)
<b>Case Study Methodology</b>	Case study methodology can be applied not only outside of the household but across social networks of family, friends, and coworkers	Case study methodology is useful in understanding older adult's ICT use
<b>Life Course Perspective on ICT use</b>	Meaning is a lifelong process of exploring the value of ICTs and a person's relationship with them; calls for more life course studies in domestication	"Snapshot" studies of use do not fully capture the meaning or use of ICTs to the older adult; meaning is shaped throughout life; Need for more life course studies

*Impacts of the User Typology on Future Domestication Studies*

This study has demonstrated that the domestication process is a valid and useful tool to explore how ICTs are used in everyday life, demonstrating differences between

individuals, and allowing user types to emerge from this study. As a theoretical lens (Creswell, 2003), domestication theory is a powerful tool for understanding use by older adults and should be more thoroughly used by gerontechnological researchers.

Domestication theory may be able to shed additional light on areas in the literature (such as the adoption of tele-health or assistive ICTs) which have been stalled in understanding ICT use due to only applying a few theoretical perspectives (mainly TAM and TAM variants) (Birkland & Kaarst-Brown, 2011). Since domestication focuses not only on the initial adoption/ introduction of an ICT, but how these devices are integrated (or resisted) into an individual's life, this theoretical lens provides a more throughout understanding of how ICTs are used by older adults.

Within the domestication literature, there have been only a few studies of older adults and ICT use. These studies have mainly been limited to examining computer, television, and telephone use by older adults of a diverse age (and therefore birth cohort) range (Buse, 2009; Haddon, 2000). These studies have examined the use patterns of older adults as a single group. However, as shown in this study, the domestication process is actually quite different among even a single birth cohort of older adults. For instance, how older adults in the study were introduced to new forms of ICTs; by relationships, through gifts, or through contexts or tasks; varied between the five user types. Differences were also seen in the use, display, and meaning of these ICTs to the various types. Differences observed in previous domestication studies may have been due to user types, and the user typology should be considered in future domestication studies as an explanation for these differences.

*Impacts of the User Typology on Future Gerontechnological Studies*

Often the gerontechnology literature has suggested that older adults are either uninterested or highly interested in using new forms of ICTs (Brabazon, 2005; Millward, 2003). In addition, much of the conceptual literature suggests that older adults are either highly skilled or lack any ICT skills (ICT). This research study suggests that there is extreme diversity not only in what ICTs older adults are using, but also in the perspective and meanings that older adults assign to ICTs that they use in their daily lives. These user types differ in how integrated those ICT's use is across their various life contexts, what they are likely to purchase (and who they allow to influence their purchase- such as family and friends), and what meaning those ICTs have to their daily lives.

Understanding these user types is critical to adopting a more nuanced view of older adults' ICT use and pushing the literature beyond the stereotypes of the "senior computer wizard" or the "senior who doesn't want computers" (Millward, 2003). Although this study did showcase individuals who fell on both sides of the spectrum being highly interested/ uninterested and highly skilled/ unskilled, there were also individuals who fell into the middle of both the interest and skill spectrum.

The user types found in this study suggest that older adults fall into different categories of user types, each of which has a different level of interest and motivations to use ICTs than the other categories. For instance, although both enthusiasts and socializers tend to be texters (or wish to be texters, as in the case of Nancy) they differ in their motivations to text. For the enthusiast, they tend to text because they wish to play with their electronic devices, seeing them as a toy on which they can explore all of the features. For the socializer, they tend to text because the people in their large inter-

generational networks text. In order to stay in contact with their large networks, the socializer feels that they must adopt those ICTs which are heavily used by those younger generations, such as texting. This is an example of how different motivations behind using a device (and the meanings attached to the device) can result in similar use of an ICT device.

These findings are critical to many different aspects of gerontechnology. Since this diversity in user types exists, it suggests that many issues that gerontechnologists are deeply involved in researching may benefit from a taking a user-types perspective, rather than treating older adults as a single group with similar motivations. For instance, one of the most popular areas of research within gerontechnology is the research of technological health innovations, both in the form of telemedicine and assistive technologies. However, acceptance and use of these devices is often examined from the perspective as if older adults are a single population whose wants, desires, and needs are similar. For instance, the adoption and use of a telemedicine device may be different for various user types- for example, the traditionalist may prefer older forms of seeking out healthcare, while the enthusiast may be the most likely to try using the new system, with the other types basing their decision on how they believe the new device falls into their lives and the overall meaning they apply to the ICT. Is the new device something that will connect them to others (in the case of the socializer), something that is a fun toy (in the case of the enthusiast), something that is a tool for a specific purpose (for the practicalist), a new and not necessarily better ICT compared to the old ways (for the traditionalist), or a potentially negative device that removes human contact and destroys relationships (for the guardian)? The perspective of user types could potentially shed light

on research that has been limited to mainly using perspectives such as TAM to examine adoption and use, which has only shown limited explanatory power as to why some older adults adopt/do not adopt ICTs (Birkland & Kaarst-Brown, 2011).

*Impacts of the Expansion into New Life Contexts on Future Domestication Studies*

This study suggests that domestication theory can and should be extended beyond the home context into other life contexts. Domestication theory has often concentrated on the home, with the belief that the home is the critical unit of consumption within our society for ICTs and other technological devices (Mansell & Silverstone, 1996). Most commonly, this has led to studies of family ICT domestication (Silverstone & Hirsch, 1992). While this study did emphasize the importance of the home for introducing and being places where ICTs are used, displayed, and develop meaning; this study also demonstrated the importance of exploring ICT use outside of the home context- in the areas of work, community, and leisure.

For many of the individuals in this study, their main path of introduction to ICTs was from work. For instance, while both Boris and Dan were introduced to ICTs through work; their introduction differed dramatically because Boris was a blue collared worker and Dan was a white collared worker. Therefore Boris was introduced to many ICTs (mainly computers and computerized technologies) much earlier than Dan. This emphasizes the importance of considering domestication outside of the context of the home, as many individuals are not introduced to ICTs through their home life (or in some cases, like Natalie, people are actively discouraged from using ICTs at home and then become introduced to them through work as a matter of necessity). Other contexts, such as community, are also important for domestication studies to consider exploring. For

socializers, such as Nancy, Gwen, and Mary, community is an important context in which they use ICTs, and it is also a context that their involvement in gives a large amount of meaning to their lives. Therefore, their use of ICTs in these areas of their lives stands out as extremely important to them and they apply richer meaning to those ICTs that are useful in this context.

Without understanding these different life contexts, it is unlikely that the user typology described in this study would have emerged. This is due to the fact that many of the most salient differences between the types was apparent because of differences in how older adults used and viewed ICT use in these different life contexts and the differing importance they gave to each of these contexts. For instance, a critical difference between a practicalist and a socializer is that the practicalist may see uses for specific ICTs in their community life, but the socializer's life tends to revolve around her family and community. The socializer uses ICTs to benefit her interactions with others in this most prized context. Exploring only the socializers and practicalists home and family use (particularly using the definition of family as those who cohabitate with the individual) these differences would not have likely been as clear. Therefore, future domestication studies must consider exploring multiple contexts in order to observe domestication patterns. Researchers must also consider that individual's ICT use may be different across these various contexts because individuals' may value these contexts differently, resulting in patterns of users like those observed in this study.

#### *Impacts of the Expansion into New Life Contexts on Future Gerontechnological Studies*

Previous gerontechnological studies have rarely examined older adults' ICT use across various life contexts, despite many authors calling for researchers to do so (van

Bronswijk, et al., 2002; van Bronswijk, et al., 2009). This study demonstrates how understanding older adults' interactions with ICTs in various aspects of their lives sheds light on what they choose to use (or not use), how they use it, and how this impacts their daily lives. As mentioned previously, it is only through exploring these various life contexts that the user typology was discovered. Older adults use ICTs for various purposes in their lives beyond the more commonly studied family domains (see for example, Vetere et al. (2009)).

In particular, there is greater need within the gerontechnological research community to understand the influence of work and ICT use within the work context for older adults. As more older adults delay retirement and continue working (Hedge, et al., 2006), there will be greater need to understand this increasingly important life context. In particular, there is a strong need for gerontechnological studies to take a life course perspective, particularly when examining an individual's work trajectory. Although many of the individuals in this study were retired, their various work trajectories strongly influenced when and how they were exposed to ICTs during their working lives and therefore influenced their skills and confidence later in life. There are often concerns in the gerontechnological community about identifying those individuals who are most at risk for being excluded in our ever increasingly technological society. Examining older adults' exposure to ICTs in work may provide some indicators as to who may be at risk.

This study suggests the power of the domestication process framework for exploring older adult ICT use/ non-use by older adults across these various life contexts. Domestication theory has not been largely applied within the area of gerontechnology. Applying such a domestication framework could help gerontechnology researchers to

further understand why and how older adults are using a plethora of ICTs in their daily lives. Although this study explored a wide range of ICTs (from the telephone to smartphones and computers), the domestication process could also highlight how older adults come to use and apply meaning to single ICTs- from home health telemedicine aids to gaming for dementia, two highly researched areas within gerontechnology.

*Impacts of Taking a Multiple ICT perspective on Future Domestication Studies*

This was one of the first domestication studies that attempted to explore a plethora of ICTs being used by individuals.<sup>16</sup> Most previous domestication studies have explored single or several ICTs (see for example Aune (1996), Ling et al. (1999), and Haddon (2000)). This study found that the integration of these devices was critical, particularly towards understanding the user types in this study. Take for instance the cell phone and landline: for the enthusiast, they tend to only use their cell phone, if they have a landline it is for other household members to use; for the socializer their cell phone is critical to connect them to younger generations; and for the traditionalist the cell phone is only an emergency device whereas the landline is a critical and prized connection to others. Studying just the cell phone in isolation would not have shown these critical differences between types because the study would not capture the decisions and choices individuals make between these ICT devices. Therefore, this study supports the notion that studying many ICTs in the same study sheds light on how individuals integrate their everyday use of multiple devices. Since newer forms of ICTs are not seen as necessarily

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<sup>16</sup> It is important to note that many of these studies are journal publications which may have studied multiple ICTs or even a large number of ICTs. However, for the purpose of publication, the author may have chosen to only present results from one or several ICTs rather than all of those studied in a much larger study. However, in my attempts to find publications which would suggest a multiple ICT study, the most ICTs studied in a single study appear to be limited to at most 2-3 ICTs. Examining each author's publication history has not suggested this splitting of single studies into multiple journal publications, but it is possible.

replacing older forms of ICTs by domestication researchers (Livingstone, 2008), studying multiple ICTs can shed light on how these devices are used in combination.

*Impacts of Taking a Multiple ICT perspective on Future Gerontechnological Studies*

ICT use is strongly interwoven into older adults' everyday lives with older adults often using a single device in conjunction with others across multiple life contexts. Previously, most gerontechnological studies have examined ICT use in isolation in a limited context. However, the study of a single ICT (such as the computer or the cell phone) does not indicate how that ICT is used by the older adult in conjunction with other devices. Often much of gerontechnology focuses on encouraging older adults to adopt new devices, without much concern for how the device could and will interact with other devices they already own and use. For instance, many older adults in the study were completely satisfied with the devices they already owned and used (this was particularly true for traditionalists) and would see a new device as an extra and unnecessary one. When it comes to understanding how a new device will fit into an older adult's life, the device and its influences on other device use must be considered. This is particularly true when considering assistive and functional devices (often studied in gerontechnology). If an assistive device complements or facilitates the use of other prized ICTs, it may be more likely to be adopted than a device which conflicts or interferes with the use of other ICTs. Therefore, understanding how an older adult relates to and uses their various ICT devices in unison may shed light on how to make new devices more acceptable to older adults or who may be a more likely candidate for a new device.

*Impacts of Taking a Birth-Cohort Perspective on Future Domestication Studies*

This study suggests that for a single birth cohort, there are significant differences in how ICTs are domesticated according to user type. This suggests that there may be differences in domestication within other birth-cohorts as well. While the overarching process of domestication has been proven and supported by this study, the findings of this study suggest that nuances within the domestication process are important to study in order to understand how ICTs are used. Therefore, in the future studies of domestication, it may be important to understand if these user types and their differences in domestication are seen across different birth cohorts and also across different cultures.

Previous research within domestication has tended to be narrowly age focused, given that much of the literature has focused on families with young children (Silverstone & Hirsch, 1992). However, a more critical approach to birth cohorts may shed light on differences in domestication between these birth cohorts which may have been due to their formative life experiences. For instance, individuals born into a birth cohort where the computer has always existed have a drastically different experience with ICT use than those who were born into a birth cohort where the computer was introduced when most of the cohort was already retired. It is possible that these similar formative experiences- which are developed over a lifetime- could result in different meanings and domestication patterns in individual cohorts. Future domestication studies should consider which birth cohorts they are studying and how these birth cohorts may have been affected by their shared experiences.

*Impacts of Taking a Birth Cohort Perspective on Future Gerontechnology Studies*

Gerontechnological studies have often focused on age ranges to determine participants. Often this is done for convenience reasons and not based upon a strategic scientific strategy (Birkland & Kaarst-Brown, 2010). Since older adults are shaped by a long life history but also by their historical experiences (such as the introduction of new ICTs) older adults from different birth cohorts have vastly different formative experiences when it comes to ICTs.

This study indicates that birth cohort studies can easily be done, but also that birth cohort studies help to control for other intervening variables, such as educational system changes, changes in societal norms when it comes to work and child care, and ICT introduction. For instance, it was very easy to compare two older adults in this study in terms of educational experiences, because all of the older adults graduated high school within roughly the same 10 year time span. During that time, major changes in the curriculum did not take place and there is some amount of confidence in comparing two high school graduates that they were exposed to similar content in school and that their degrees were relatively comparable. When it came to the women in the study, many left work for a time period to raise children while others did not, reflecting the common work trajectories experienced by women during this time period. In particular, this birth cohort's experiences with work and education (as well as with a host of other phenomenon), like all birth cohorts, is unique. Coming to adulthood shortly after a major world war, this birth cohort saw major advances in health, education, work, and women and racial civil rights (Carlson, 2008).

Comparing the Lucky Few to other birth cohorts that are closest in age, one could not expect their experiences to be similar. The Good Warrior birth cohort had lesser amounts of education (being less likely to finish high school) and less female labor force participation later in life compared to the Lucky Few. The following Boomer birth cohort was more likely to go to college and had greater female labor force participation than the Lucky Few (Carlson, 2008). Given how important the work context and work trajectory was found to be in this study, one can easily see how these life differences could result in very different experiences with ICTs throughout their lives and shape their ICT domestication in elderhood. Combining these different birth cohorts into the same study can distort study results because of these drastically different experiences. In the future, more gerontechnologists should focus on birth cohort studies or account for the birth cohorts they are studying to minimize these potential effects.

#### *Impacts of Using the Case Study Methodology on Future Domestication Studies*

Most domestication studies use a case study methodology when exploring ICT domestication. However, most of these cases tend to be centered on a single home environment, without considering the larger context surrounding the family being studied (see for example Habib and Cornford (2002)). This study has demonstrated that taking a larger case perspective and including individuals outside of the immediate home environment can lead to greater insight on everyday ICT use. Since ICTs are increasingly interconnected, their use is not just within the home environment but stretches outside the home environment. Not only do ICTs bring the world into the home (through things such as the media) but also the home produces content through the ICTs that is brought out into the world (Silverstone, 1994; Silverstone & Hirsch, 1992). Therefore, taking a wider

perspective on whom to include in case studies may shed light on everyday use in the home.

*Impacts of Using the Case Study Methodology on Future Gerontechnological Studies*

Within gerontechnology there have been very few case studies. The case study format offers some unique advantages which could be useful to future gerontechnology studies. First, the case study methodology is particularly effective in determining nuanced reality or emergent phenomenon that is difficult for the researcher to ascertain at the outset of the study (Flyvberg, 2006). Secondly, case studies are also helpful in generating theory (Yin, 2009). Since gerontechnological research tends to lack a strong theoretical base, case studies may be helpful in generating much needed theory in this area. In addition, because of the case study methodology's power in detecting variables and influences on a phenomenon, the case study methodology may be able to shed light on how and why individuals are using ICTs in their daily lives. The comparative series of case studies used in this study were relatively simple in design and easy to implement, but yet were able to shed deep understanding and generate theory as to how these older adults were domesticating ICTs within their daily lives. Much of the current literature on adoption of ICTs (particularly in the case of assistive and healthcare devices) is stalled on understanding why these devices are adopted or not-adopted. By using more case study methodologies, researchers may find that they are able to generate more theoretical propositions and discover emergent phenomenon.

*Impacts of Using a Life Course Perspective on Future Domestication Studies*

Much of the research in domestication (similarly to gerontechnology) focuses on current meanings and use of ICTs in the everyday lives of people, families, and

professional groups (Silverstone & Hirsch, 1992). However, meaning (and in fact use) is a process that develops over time. As can be seen from this study, many of the individuals were strongly influenced in the meaning they assigned to ICTs by life events which often occurred decades before. For instance, many of the enthusiasts were influenced by experiences with ICTs and technologies in childhood that occurred 50 years before this study took place. Guardians were often shaped by negative experiences with ICTs in middle adulthood, which were sometimes 20 to 30 years before the study. When these individuals were asked to tell their most salient memory regarding ICT use, these are the memories and stories they told and these individuals felt that they had the most impact on their views. Considering how important these earlier life events were, this suggests that domestication studies could benefit from taking a life course perspective. Rather than exploring the current meanings of ICTs and discussing only current use, the researcher would encourage future studies to examine how the individual and family has been shaped by their previous use and experiences throughout their lifetimes. The richness of the life course perspective can add depth to future domestication studies by understanding how individuals came to give ICTs meaning over their lifetimes.

#### *Impacts of Using a Life Course Perspective on Future Gerontechnological Studies*

There are several researchers who come from gerontological backgrounds who have long called for researchers to take a life course perspective when studying older adults (Elder & Giele, 2009; Giele & Elder, 1998). Most of the research within gerontechnology focuses on ICT use at a single point in time, often through survey research. Such “snap shot” studies do provide good data on what is currently being used by older adults, but lack the larger context of how that use has changed and the meanings

behind their current use. In addition, the focus on what is “currently happening” often neglects important life course influences on ICT use. Most notable from this study is the influence of work trajectory on ICT exposure, with women in pink collared positions often being exposed to ICTs before white collared workers.

If this study had chosen to ignore the work trajectories of these individuals, the increased confidence these women had in using ICTs compared to their white collared counterparts would have been unexplained. As a result of findings like these, taking a life course perspective where individuals are seen not only in their current state, but their lives are examined in depth to understand how they arrived where they currently are in life, can lend greater explanatory power to future gerontechnological studies.

The final section of this chapter examines the practical implications of this study to the design and development of ICTs and ICT policy.

### **Implications for Practice: Design & Development of ICTs and ICT Policy**

This final section of this chapter focuses on how the findings of this study affect practice specifically in the areas of design and development of ICTs and ICT policy implications. Each of these areas is detailed in the table below and the following two subsections concentrate on each of these implication areas in turn.

**Table 5.7 Implications of this Study for Practice: Design and Development of ICTs and ICT Policy**

<b>Study Findings and Contributions</b>	<b>Design, Development, and Marketing of ICTs Implications</b>	<b>ICT Policy Implications</b>
User types	Older adults are not a single population with similar tastes, desires and needs; Users desires and needs in ICT devices depending upon user type: suggesting diverse marketing strategies and developments; Many users are introduced to ICTs as gifts from their family and/or friends (suggesting marketing to family/friends) while others are self-purchasers (depending upon type)	User type may determine acceptability of ICT Policy; Certain user types may be more at risk if ICT policies require use; ICT policy should be tailored to recognize different user types; Some user types are adept at using others (such as traditionalists) to access important information- incorporate such information gathering strategies into policies on ICT use
Consideration of Work, Leisure, and Community Domains	Needs to consider the manufacture, design, and marketing of devices for older adults beyond a focus on “family” interaction	The appropriateness and acceptability for ICT use in any context (such as electronic voting) is different depending upon user type- some users may be disenfranchised by or resistant to requiring ICT use in certain life contexts
Work Status and Occupation type/ position	-	Retired individuals may be at higher risk for loosing critical access and up-to-date knowledge; often retirement occurs at the same time many older adults apply for Medicare and other benefits online
Societal Understanding	Provide support individuals who are trained to speak to older adults who may feel overwhelmed or “out of the loop” to earn loyal customers; Provide alternative non-ICT services for a low cost (reassure individuals that they will remain in place)	Provide alternative means for accessing information or use required systems (or support individuals who can intermediate the process)
Importance of Social Support	Organizations can consider training and support programs that are accessible and available to older adult users	Policy should consider ways to support individuals who have little social support in the community in using ICTs
Construction of ICTs/ Physical Limitations	There is demand for accessible devices that allow older adults to fulfill their needs and desires for their type.	Government programs should ensure that devices that are provided to older adults who are low income are accessible

### *Impacts on Design, Development, and Marketing of ICTs*

The user types have a potential impact on the design and marketing of ICTs for the older adult population. Often, when ICTs are developed for the older adult population, it is assumed that these older adults are a single population with similar desires and needs for ICTs. This research has demonstrated that there are five distinct

user types within the Lucky Few birth cohort, which have different desires, needs, and meanings of ICTs. When designing an ICT, the ICT's appeal will be different to these user types. For instance, an ICT which allows a member of the Lucky Few birth cohort to connect to others will be attractive to socializers, particularly if those ICTs actually strengthen the relationship between the socializer and their intergenerational contacts. Practicalists will be more likely interested in ICTs that are seen as having a delineated purpose and are tools. The power of the user types is that it allows designers to target their designs for specific portions of the older adult population. The design of these devices is not targeting older adults specifically, but rather different user types who happen to be older adults.

A second related contribution of this study is that it sheds light on how one might market ICT devices to older adults. Since not all older adults find ICT devices equally appealing, nor seek out to use devices for the same purpose, it is unlikely that a single marketing strategy of such devices appeals to all older adults equally. For various older adults, the cell phone is their only phone, while for others it is a vital connection to large social networks, and for others it is purely an emergency device for their own use. Therefore, the marketing strategy for a cell phone must recognize that older adults have this diversity of needs and wants in devices, and therefore target the marketing of devices with these features to ensure they are adopted by a large portion of the older adult population. For instance, a cell phone designed for texting is most important to socializer. By marketing such texting-targeted cell phones to the socializer, these ICTs are more likely to be purchased by the older adult than devices that do not have these features emphasized. Therefore, not only must devices be designed for these user types, but also

marketed in a way that incorporates the user type's desires in the devices. For many of the user types in the study, ICTs are often gifts from family members or friends. While traditionally there has been little marketing of ICTs to older adults (Hubak, 1996), there has been even less marketing of ICTs to family members and friends of older adults. Therefore, combining not only marketing targeted towards these user types but also marketing targeted towards those who buy for those user types may be useful.

Of those few ICT devices that are marketed towards older adults specifically (such as the Jitterbug cell phone), often the focus is on what the device allows the older adult to accomplish with family and friends. However, as shown in this research, older adults are involved in many life contexts beyond friends and leisure, including work and community. Several of the older adults in this study were still working, and the majority of these older adults used ICTs in their everyday work. Some of those who were working had self-purchased many of the devices they used at work, including computers, printers, cell phones, and GPS devices. Those that design, develop, and market devices should not forget the ever growing portion of older adults who are continuing to work.

One of the findings from this study was the older adults often feel overwhelmed by a plethora of new ICT devices and services and feel little support from society in learning to navigate these struggles. However, many of the older adults commented that they were loyal customers to organizations that offered detailed and understanding technical support. Particularly important was technical support personnel who could explain things slowly and in a basic way and who did not treat the older adult as if they were "stupid" (Margaret). Older adults also preferred having access to services that were "low tech" alternatives, even if that meant paying a bit more. For instance, many of the

older adults in the study preferred to have paper bank statements and to pay bills by check (rather than online). These individuals often worried, however, that these services would be removed. Organizations should ensure that these programs not only stay in place to keep these customers and reassure these customers that the “old” way of doing things will remain in place.

There is also the potential for organizations to provide ICT training to older adults. One of the specific programs mentioned by an older adult as being extremely helpful to her was the Apple Training One-to-One program. For Jackie, this program provided the support she needed to not only learn how to use her computer, but also to learn to trouble shoot problems and clear viruses from her machine. Since Jackie lacked a local supportive social or family network that could help her to learn these things, this formal program filled a much needed void in her technology life. Older adults who had small or similarly far removed networks (such as Natalie) who did not have the support of such programs often floundered and struggled. This suggests that for older adults who do not have friends, family, or neighbors who are willing or able to help the older adult to learn about their devices and help them through problems commercial programs may be a solution. Jackie felt that her experience with the One-on-One program had made her a lifelong (and vocal) Apple “fan.” Organizations that produce ICT devices should consider such programs and market them towards older adults. These programs should be flexible considering the vast differences in skill levels of the older adults and also able to be tailored to the specifics that the older adult wishes to learn.

Finally, there needs to be consideration for older adults with disabilities or functional declines when it comes to the design and development of ICTs. While this

focus on adaptability has been a main focus for gerontechnological scholars and engineers, the results from this study make it clear that far too many devices are still difficult for those with impairments of any age to use. In particular, those who manufacture devices and services for governmental aid programs should consider that some of their devices may be used by older adults who have functional impairments.

Most importantly, this study calls for designers, marketers, and researchers to move away from the notion that older adults are a single population with similar and specific desires and needs for which to create and market devices .

### *Impacts on ICT Policy*

In the United States, a number of policy decisions have been made to cut costs by moving information that is vital to older adults online. One such policy decision was the move to put information about Medicare online (and online only) several years ago (U.S. Department of Health and Human Services, 2003; Wright & Hill, 2009). This study suggests that because of the individual's user type, some individuals may find the information being placed online as advantageous and welcome it (enthusiasts and practicalists), while others may find accessing this information nearly impossible (traditionalists) or begrudgingly access it through an ICT form they do not prefer (guardians). The existence of these user types suggests that such policy interventions will be met with a diversity of responses. If these user types are found across several birth cohorts, particularly the boomers and generation X, it is unlikely a function of time (with new birth cohorts moving into the older adult spectrum) will solve differences in response to such policy decisions. In other words, if these user types are found across multiple birth cohorts, it's unlikely that the "aging out" of the current population of older

adults will result in a new set of older adults who are uniformly more accepting of using the most modern forms of ICT devices.<sup>17</sup>

Oftentimes in the literature, the acceptability of ICT policy is supposed to be due to income and education, with those with lower income and/or education thought to be the least accepting of new innovations and policy which attempts to use such ICTs (Hayes-Bautista, Hsu, Perez, & Gamboa, 2002). This was not discovered to be true in this study. Several of the individuals who were low income (Gwen and Jackie) had both access to computers and the internet (although their internet connection was through the library). Both of these women also had relatively good internet and computer skills, suggesting that those who resist the attempts made by the government to force older adults to use ICTs for vital tasks are not just unable to use ICTs because of access difficulties due to low income. While Mindy Jean (high school education) was not a computer user, Jackie (who did have some college coursework) was. Among men, there was no difference between having a high school or college education. Such findings suggest that ICT policy should consider these user types as being more useful to determine who will be affected by such a policy, rather than assuming that low income and/or lower educated individuals will be those who are automatically impacted by such a policy.

For traditionalists, increasing ICT policy tended to not impact them, despite the fact that they themselves often were not regular computer, internet, or cell phone users.

This was because they tended to use others very effectively to gather necessary

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<sup>17</sup> It is often suggested in popular culture that once the older adult population ages out (dies) that all resistance to ICTs will pass. ICT resistance, however; is not necessarily just a movement by older individuals. If these user types are found in various birth cohorts (see the next chapter for a fuller discussion of what research needs to be completed to determine this) then it is unlikely that time will solve this issue.

information or services from ICTs. For those who create information policy, one must consider that some older adults will have others access the vital information or service for them. Therefore, it would be helpful to have such services tailored to a potential family member or friend, rather than assuming that the older adult themselves are the ones directly accessing the information or services. Consequently, there is a concern that if these individuals lose their “ICT person” who normally undertakes these tasks, these individuals are at risk of not being able to access digitalized services and information. This study has also demonstrated that older adults may be at risk of losing access to ICT devices, support, and services during retirement. Since the age at which many older adults retire also corresponds to collecting social security and Medicare, many older adults are losing access to ICTs during the same critical period in which they need to find information about these programs online.

One solution to this is to offer free help to older adults who cannot access these services themselves (particularly if non-ICT alternatives are not available). When Medicare went online-only, many companies that typically interact with older adults (most notably pharmacies) offered free computer services where an older adult could come in and work with a representative (who essentially used the computer) to pick their Medicare plan (Wright & Hill, 2009). Besides for-profit institutions roles, there is also the possibility for non-profits such as libraries, schools, and other venues to offer free assistance programs on occasion for older adults who need access to these online services but no longer have the support they need to do so.

Several individuals in the study did want to use ICTs but encountered difficulties in finding support from friends or family members in using and learning about ICTs. Free

community classes might be one potential avenue for supporting older adults in developing technical knowledge and providing technical help. Trial programs have included using high school and college students to tutor individuals (Irizarry, et al., 1997; Shoemaker, 2003). While it seems that other avenues can be provided for low income older adults with small social circles for providing technical help and assistance (such as community classes), these older adults may be at a disadvantage when it comes to actually purchasing, replacing, or accessing ICTs. Therefore it is critical that many of the organizations that provide access to these ICTs (most notably libraries in this study) are supported and continue to provide ICT access.

Finally, it is critically important that policy makers consider the physical and cognitive needs of older adults when it comes to policy efforts such as government-provided ICTs (such as cell phones). Since the government works with private companies to provide such phones and services, governmental policy should encourage these cell phone providers to have accessible cell phones available for older adults with physical limitations. Since older adults are one of the major recipients of this form of government aid, it is unclear why the phones provided would be so small and difficult to use if an individual had eyesight or dexterity issues. If the government's goal is to allow these individuals to remain connected to society (including family, friends, but also healthcare and other resources), it makes sense to have devices which are easy to use. It should not just be up to the companies that work with the government to provide such devices, but the government itself should demand that accessible devices are available.

The final chapter of this dissertation focuses on the choices made by the researcher, the limitations of this study that stem from those choices, and the opportunities for future research.

## Chapter 6 Choices, Limitations, Future Work, & Reflections

This chapter begins by discussing the choices, limitations, and areas of future work that stem from this study. The second half of this chapter reflects on the study itself and the methodology chosen, and provides some tips for researchers who are interested in conducting a similar study.

### Design Choices, Limitations, and Future Work

With any research design, a researcher makes choices which have implications and ramifications for the findings of the study. The table below outlines each of the choices made in this study, the limitations these choices brought to the study, and the remaining questions that much be answered in future work as a result of these limitations. The following sections address each of these choices in depth.

**Table 6.1 Choices, Limitations, and Resulting Questions for Future Work**

<b>Choice</b>	<b>Limitations</b>	<b>Remaining (and Resulting) Questions for Future Work</b>
<b>Theory generation study (as opposed to theoretical testing)</b>	No statistics on frequency or gendering of types; Not a representative sample	Validation of the user types theory What is the frequency of these user types among the Lucky Few? (potential for developing a survey) Are these user types regional or cultural? Do user types lead individuals to choose certain careers based upon ICT use in that career?
<b>Retrospective study of ICT Use (as opposed to prospective study)</b>	No data on casual factors or change over time in user types	Are user types static and stable over time? Can individuals change type? What causes someone to become a certain type? Are there trigger points for user types? When do they occur? When is someone's user type solidified? Is the Guardian type only the result of negative ICT experiences in mid-life, or can earlier or later experiences activate the Guardian type? Can user types be influenced or changed due to early experiences? Can early education and exposure to ICTs influence user type?

Choice	Limitations	Remaining (and Resulting) Questions for Future Work
<b>Single Birth Cohort Study Rather than a Comparative Birth Cohort Study</b>	Only can make limited generalizations to the Lucky Few Birth Cohort	<p>Do these user types exist across multiple birth cohorts?</p> <p>How do user types differ in frequency across multiple birth cohorts?</p> <p>Are specific user types “different” in their perspectives and meanings based upon birth cohorts?</p> <p>How do time and historical events (such as the introduction of new forms of ICTs) impact user types in different birth cohorts due to cohort flow?</p>
<b>Case Sampling Criteria of Gender and Work Status (versus other potential case sampling criteria)</b>	Limited in exploring how other possible selection criteria (race, educational level, functional ability etc.) impact use	<p>Are there effects due to race/ ethnicity in user type frequency?</p> <p>Does educational level impact user types?</p> <p>What impact does functional ability have on user type?</p> <p>Is there a relationship between an individual’s user type and when they choose to retire?</p> <p>Is there a relationship between an individual’s user type and career path?</p>
<b>Limited Number of Small Case Studies</b>	Limited number of primary participants; limited couple and household interviews	<p>How do different user types interact in a household environment and impact what is purchased, how it is used, and how it is displayed?</p> <p>How is display impacted by different user types in the same household?</p> <p>Is the meaning for one user type impacted by being in a close relationship with a different user type?</p>
<b>Inclusion of Secondary Participants</b>	Limited the resources available to examine more older adult cases; limited birth cohort diversity; limited number of secondary participants	<p>Are there differences between birth cohorts on views of choice and ICT use by older adults?</p> <p>Are there differences in views about older adult ICT use based upon the relationship type between primary and secondary participants?</p> <p>Are certain user types more accepted or less accepted by other birth cohorts for older adults?</p> <p>How does social support and income interact for older adults in influencing ICT use? What types of social support relationships are most important (e.g. family, friends, community members)? Does social support have to be nearby to be effective? Are there commercial or community systems that can be put in place to support isolated older adults?</p>
<b>Imbalance of Female and Male Participants</b>	Unclear if some effects (such as gendered user types) are due to gender impacts or fewer male participants	<p>Are the three types which were only found in females (Socializer, Traditionalists, and Guardians) gender specific?</p> <p>Are there types, if not gender specific, that are comprised of more women or men (predominately female, predominately male types)?</p> <p>How do gender roles interact with an older adult’s experience to create a user type, if types are gender specific?</p> <p>For younger birth-cohorts are user types gendered? Is</p>

Choice	Limitations	Remaining (and Resulting) Questions for Future Work
		gendering of user types a cohort effect?
<b>Lack of Racial and Ethnic Diversity</b>	Unclear if race or ethnicity impact user types	Do ethnic or racial backgrounds impact user types? Are certain user types more common in certain ethnic or racial communities? Are these user types culturally specific?

### *Theory Generation versus Theory Testing*

This study was a qualitative case study design that focused on theory generation through intensive deep case studies of multiple participants and 8-12+ hours of interview audio per case (as well as photographs and observations per case). Originally, the researcher chose to focus on theory generation for two reasons: first, the area of gerontechnology is lacking in theoretical development (and therefore a suitable testable theory was not available) and the lack of research in the area of older adults and ICTs meant that a much more exploratory (as opposed to confirmatory) study was required. This was determined to be a good choice as the interpretive case study design was able to identify the user types. This interesting new work may be helpful to gerontechnology and domestication researchers in framing their future studies and understanding differences in everyday ICT use. Future work must test this theory to see if and in what circumstances it is valid.

Since this study focused on theory generation, however, very little can be said about the frequency, number, or gendering of the types discovered. Since in order to generate this theory a small intensive set of cases were chosen, this means that this study cannot speak to how widespread these types are in the general population, if there is a true gender role effect on the different types, or if these types differ across geographic areas or across cultural boundaries. These are some of the limitations to the study's

generalizability, which must be further tested. Further work must be done on these types in order to determine the frequency of these types, as well as to further explore and test correlations and possible causal impacts on the types, such as gender roles, childhood experiences, etc. Ideally, the next step in this research process would be to create, test, and implement a survey based upon these user types which could shed light on some of these important questions.

### *Retrospective Case Study versus a Prospective Case Study*

When studying phenomena that occur over a lifetime (such as ICT use and meanings), it is important to take a life course perspective that captures more than a single snapshot in time. The best designed studies track individuals over their lifetimes, often from childhood. In these prospective studies, issues such as memory are not critical, as use and meanings are being recorded as the individual experiences them. In retrospective studies, however; participants are more prone to misremember instances and be shaped by the totality of their experiences (Scott & Alwin, 1998). As a retrospective study, this dissertation is limited as the participants may misremember dates or how they felt at a certain point in their lives in their interaction with ICTs. In some cases, this was proven to be true- most people could only name rough time spans in which they started using an ICT (often half decade periods) and sometimes could not remember motivations for using an ICT, particularly if it was in early adulthood (which for some older adults was nearly 50 years ago). For the vast majority of participants, more specific dates and feelings could be recalled in a second interview after the participant had thought about the incident during the interval between interviews. However, even with improved recall of dates and feelings, such feelings about ICTs are

being translated through their following experiences with and their currently developed meanings towards ICTs.

Within the life course literature, such retrospective studies are common because of the difficulty in designing and implementing prospective studies (Scott & Alwin, 1998). (For the sake of completion of this dissertation in a timely manner, tracking individuals from childhood to older adulthood was not possible.) Many authors have argued that when studying older adults' current state, views, and meanings, those memories which are the most salient are the most important to having shaped the older adult. Therefore, there is value in retrospective studies because those memories which remain salient over time are the ones which are most meaningful (Denzin, 2001).

One of the largest limitations in such a retrospective study, however, is that the researcher is not only dependent upon the participant's recollection of events and meanings, but also that the researcher cannot track events and changes in meanings over time. This means that this study cannot answer questions such as the stability of user types over time (can user types change over time, and if so, how?), when types become solidified if they are stable at some point in a person's life, and if there are triggers for user types (and when these triggers must occur to activate a user's type). Ideally, to answer these questions a researcher would conduct a prospective study which followed a group of individuals from childhood to elderhood to understand how life events impacted their user type over time, if that type was stable, and if any event triggered a change in user types.

There are often concerns as to how the United States will meet an increasing demand for IT professionals with a decreasing number of students seeking training in

such fields (Guzman, et al., 2008). Since enthusiasts are the most likely to point to childhood experiences as influential in shaping their lives and more likely to join IT professional careers, it will be important to understand if there is a link between these early experiences and user type, and therefore if user type can be influenced by early positive ICT experiences. Ideally, such studies would be experimental or quasi-experimental in nature and could test strategies to encourage the development of enthusiasts (if a link between childhood experiences and user types is validated in further studies).

#### *Single Birth-Cohort versus Multiple Birth Cohorts Study*

One of the greatest strengths of this study was that it was a birth cohort study rather than an age-based study. As written previously, birth cohorts share similar historical events (including technological advancements), which gave this study some control over the innovations that these individuals could have possibly been introduced to and when they were introduced to them in their life (childhood, teen, young adult, mid-life, late working career, etc.). This choice removed some of the confusion that exists in previous studies as it allowed the researcher to “track” how various ICT innovations impacted individuals in the same birth cohort similarly or differently; however, it also introduced some drawbacks to the study.

One of the most critical things to explore in future research is if the User Types findings hold true across other birth cohorts of older adults, as well as other findings, such as the findings surrounding gender roles, income and social support, and work trajectory and ICT exposure. For instance, are all five user types found in each of the birth cohorts that make up the older adult population (including the World War II

Generation and the Boomers)? Questions about the frequency and prevalence of these User Types must also be explored, as mentioned previously.

As initial evidence of the value of future research on this area, interviews from the secondary participants (who were of various birth cohorts) suggest that these user types may be seen in the various birth cohorts that were included as secondary participants in the study. For instance, potential enthusiasts were discovered in all of the different birth cohorts involved in the study. Potential traditionalists, practicalists, and socializers were also seen in the Boomers and Generation Xers who participated in the study.

However, since the secondary interviews with these individuals were both short (ranging in time from a half an hour to a hour and a half) and did not seek to explore the secondary participant's own use (but rather their use of ICTs in their relationship with the primary participant), it is difficult to say with certainty that these users types are found in all of the birth cohorts. Previous research suggests, however, that these user types may be found in other birth cohorts as well. The findings of this study echo Kaarst-Brown's (1995) findings. Her archetypes were found spanning individuals who ranged in age from their 20s through their 60s, suggesting that those archetypes were found across several different birth cohorts. Since the findings of this study correlate with the findings of Kaarst-Brown, it is likely that these types may be found in various birth cohorts just as Kaarst-Brown's archetypes were found across various birth cohorts. However, despite these suggestions from the secondary participant interviews and previous research, empirical studies should be undertaken to examine if these user types are seen across all birth cohorts.

If these types are observed in other birth cohorts, it will be important to understand if and how each type is affected by the birth cohort of the individual. For instance, the traditionalist is most comfortable with the ICTs of their youth and young working careers. For the Lucky Few, that tends to be the telephone, radio, and television; and they tend to be less comfortable with newer ICTs which were introduced when they were older. If traditionalists are found in younger birth cohorts, it is likely the acceptable ICTs change due to different ICTs being available in their youth. For instance, are there potentially traditionalists among Generation X-ers? This birth cohort may be perfectly comfortable with the computers and internet introduced in their youth and early working lives, but reject newer ICTs, such as social networking or any ICT that is introduced in mid-life or later. Future research, including longitudinal studies, should examine to see if this aspect of “cohort flow,” or the interaction of an individual’s birth cohort with the timing of historical events (Elder, 1985; Elder & Giele, 2009) results in different types of ICTs being acceptable to successive birth cohorts.

Research on these user types should also examine the frequency of these user types within each birth cohort (as well as across birth cohorts, if applicable). One of the limitations of this study was that it gives no indication of the frequency of these user types within the birth cohort studied or other birth cohorts. For instance, it is possible that a certain percentage of each user type is found in every birth cohort or that historical events that impact birth cohorts differently might result in different frequencies of user types.

### *Case Sampling Frame and Impacts*

The case selection criteria for this study focused on the cases meeting a sampling framework. This means that no attempts at obtaining a random or representative sample were taken. Instead, cases were selected on two criteria: work status and gender, which meant that other possibly important variables were ignored in case selection. Selecting for the two variables of work and gender were considered critical based upon previous studies (see chapter 3). However, although selecting for more variables would have possibly made this study a more substantial and stronger one, it would have made case selection near impossible given the time frame and constraints of this study. Seeking the various permutations of work, gender, socio-economic class, education level, and race alone would have resulted in an unwieldy number of cases.

While these cases were not selected based upon these variables, there was a limited amount of diversity across all of these variables. For instance, the sample included both men and women with educational degrees ranging from high school (or high school equivalency) to holding doctorates; participants who were very low income (including several Section 8 qualifying participants) and relatively high income; and although the primary participants were mostly white, two were African American/ Black women. While representativeness was not achieved, nor were these criteria selected for, the researcher was mindful when recruiting and interviewing participants of these potential casual variables. However, despite this diversity, this study is limited in that it cannot make sweeping statements for any of these groups and any findings that this study suggests in regards to these groups must be further explored. Ideally, such studies would

explore these phenomena using stratified or random sampling to understand these relationships in the general population.

In particular, several of the emergent findings, such as the impact of social support for low income individuals in obtaining ICTs and learning how to use them are critically important to explore in further studies. Further studies should concentrate solely on exploring this phenomenon to determine if this finding holds true across low income older adults. Other directions for research include creating and testing more accessible ICT devices for older adults with impairments. Other studies could explore how ICT policy could be changed to allow for accommodation for older adults with impairments who rely on governmental programs for ICT access (such as those programs which provide cell phones to low income individuals).

#### *Limited Number of Small Case Studies*

In order to allow for the depth of interviews necessary in this dissertation study and the time commitment such interviews would take, this study was limited to 17 cases of older adults and secondary participants. The choice to have limited case studies and multiple interviews allowed this study to examine the meanings of ICTs in depth (which will be discussed later in this chapter). However, the choice of a limited number of case studies meant that possibly interesting findings could not be explored because only a limited amount of data was collected.

One such possibly interesting finding was the relationships between participants and user type, particularly when it came to cohabitating/married/romantically partnered participants. Unfortunately, only a limited number of spouses or significant others were captured in the study, and this cannot shed adequate light on how two different user types

interact in a household and negotiate ICT introduction, use, and display. This area of research is critically important, particularly for those user types who are at risk for not being able to access critical information or services if their spouse/ partner is no longer able to do so. For instance, Mindy Jean (a traditionalist) depended heavily upon her spouse, George (a practicalist), to access things that were online or to use complicated newer ICTs. If something happened to George, he worried that she would not be able to handle certain digital aspects of their lives, such as online bill paying and banking.

Beyond the concerns of those who choose not to use more modern forms of ICTs, there are interesting questions of how individuals in mixed user type relationships navigate the purchase, display, and use of ICTs. Do differing user types cause conflict issues in these families? Are there certain mixed type relationships which are more or less conflict ridden when it comes to ICT choices? Do ICT meanings change for a particular individual based upon their close contact with a different user type? These questions are not only interesting to explore in romantic relationships, but other types of relationships as well.

Ideally, future studies would look more closely at the family units who live together (in this study, mainly spouses and romantic partners) to understand these interactions between different or similar types. Such studies could draw on domestication studies that have examined household use and explored ideas such as conflict and negotiation over ICT domestication.

#### *Inclusion of Secondary Participants*

The inclusion of secondary participants will be addressed more in depth in the remaining section of this paper. Originally, secondary participants were included in the

case study to add depth to understanding ICT use by the older adult in their relationships and to understand ICT expectations of differing birth cohorts. Unfortunately, secondary participants were often difficult to recruit for the study and had high rates of drop out after having committed to participate. This limited the birth cohort diversity of those secondary participants who remained in the study, while drawing resources away from studying more cases of older adult ICT use.

Several questions remain from the study because of low numbers of secondary participants. Since there was limited birth cohort diversity among the secondary participants, it is unclear if expectations for older adult ICT use differ among birth cohorts. For instance, younger birth cohorts could expect older adults to use more or less ICTs than slightly older birth cohorts. In addition, it's unclear if these expectations do differ or if there are some birth cohorts that are more accepting of the diversity in older adult ICT use than others. Since there were fewer secondary participants and therefore limited numbers of participants of each type of relationship between the primary and secondary participant, it is unclear if there are differences in expectations of ICT use by older adults based upon the type of relationship (parent/child, spouse, coworker, friend, etc.). Both of these categories of questions are important to answer as they shed light on how accepting overall society will be of an aging population with diverse ICT use patterns. Such future studies should concentrate on both birth cohort and relationship diversity to answer these questions.

A second large category of questions centers on social support and ICT use. Several of the secondary participants were "ICT helpers" and technical help people for the primary participants in the study. (It's important to note that both Fred and Harry

were the technical support individuals for their families.) Future studies need to explore these social support relationships in depth to understand what makes some of them effective and supportive, and what makes others less so. This includes answering questions about the distance between the support individuals and the primary participant, the types of relationships that make support more viable (are family relationships more critical than community ones?), and if there are community or organizational support systems that could be put in place to help older adults who lack an adequate social network. This area that explores social support represents many important studies that could be undertaken, including more qualitative studies of the relationships, but also case studies and experimental studies of potential programs that fill the social support gap felt by many participants.

#### *Gender Imbalance*

As a result of the sampling frame used in this study, the primary participants were predominately female. Originally this was due to incorporating several women who had chosen to stay at home following marriage or birth of their children. It was difficult to find matching men who had also stayed at home. The original sampling frame called for 9 females and 6 males. Late in the study, two retired African American/ Black women wished to join the study and were recruited. This led to a greater imbalance of women to men, with 10 female participants and 7 male participants. With fewer male cases than female cases, it is difficult to determine if some of the potential gender role effects seen in the study, such as the gendering of types (with Socializers, Traditionalists, and Guardians all being female) are due to gender roles or are due to the limited number of primary male participants and small sample size.

It is possible that with more male cases, all five of the user types could have been observed among both men and women. There were no guardian, socializer, or traditionalist men observed in this study, and this may have been due to only 7 male cases (compared to 10 female cases). If more men had been included in this study, it is possible that male examples of these types would have been discovered. Therefore, no strong statements about the impact of gender roles on types can be made.

Despite this, there is some early support for male traditionalists or other types existing due to the researcher's field experiences. Margaret's live-in romantic partner was strongly opposed to participating in the study, despite Margaret's own attempts to have him participate either as a secondary or primary participant. His reasons for opposition, according to her, were that "he doesn't want to be involved in any of this technology stuff." Margaret was originally recruited into the study through her neighbor, Charles, who served as a secondary participant. Charles relayed the story of how Margaret's partner discussed that study during his interview, 'Margaret's partner just said "No. I don't want any part in that. Margaret can do it, but I won't."' So Margaret and I let the subject of your study drop rather than pushing him to participate.' According to both Margaret and Charles, Margaret's partner was a heavy TV watcher but had no interest in learning to use a computer, the internet, or a complicated cell phone. This suggests that Margaret's romantic partner may be a traditionalist (hence the preference for older forms of ICTs). Since he was not a participant in the study, there is no empirical evidence that he is necessarily one type or the other, however strongly the interviews with those around him may suggest he is the traditionalist type. It does, however, encourage future exploration of all five user types among a larger sample of male participants.

This gendering of the types (with women being represented across all five of the user types and men only represented in three user types) is one of the largest gaps in this study that needs further research. With a much larger study, it is possible that men could have been found across all five of the types. It is also possible that socializers, traditionalists, and guardians could be somewhat gendered, in the sense that they are predominately female types. This is quite possible, as society tends to reward women for being more “social” and “connected” with family, community, and friends (and could encourage women more so than men to become socializers, for instance) and encourages women to be involved in the upbringing of children (and could encourage women more so than men to become guardians). This also could reflect a birth cohort effect of gender roles. Gender roles were far more strongly socially enforced for the Lucky Few when they were young compared to more recent birth cohorts (Carlson, 2008). This could suggest that even if these user types are strongly gendered for the Lucky Few, they may be less gendered for young birth cohorts who were not subjected to such strong gender norms and therefore have more males in each of these user types.<sup>18</sup> Future research should focus not only on if the user types are gendered, but why they are gendered.

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<sup>18</sup> There is evidence that gender norms may be more strongly enforced and embedded for the Lucky Few than previous and following birth cohorts. The eldest of the Lucky Few women came of age right as the baby boom took off, and many of these young women were swept up into high marriage rates and high birth rates. Essentially, these women came of marrying age just as men of the WWII generation returned from the war, and like the women in the WWII generation, were highly likely to marry in the waves of high marriage rates that occurred after WWII. However, these women were younger than their WWII generation counterparts at age of marriage and first childbirth, were less likely to have worked substantially before marriage if they were middle class (unlike their WWII middle class counterparts who worked in the war effort), and were younger when the waves of focused female domesticity as a cultural value hit in the late 1940s and early 1950s. Therefore, these women were strongly impacted by these cultural changes very young in adulthood (Carlson, 2008). The impact of the baby boom and the focus on marriage for these women was reflected in the sample- out of ten female participants, seven were married before age 20. The remaining three were all married before the age of 25. This is reflective of the lower age of first marriage seen in women of the Lucky Few birth cohort than for the previous or following birth cohorts. It has been speculated that these experiences in early adulthood made it more likely that gender norms were enforced for Lucky Few women.

Focusing on the reasons why these patterns emerge is important to understanding the underlying structural forces at play (Trauth & Howcroft, 2006).

Previous research that has examined gender roles and ICT perspectives has suggested that women tend to be more critical of the social impacts of ICTs on their families and children than men (Habib & Cornford, 2002), which may suggest that the guardian perspective could be held predominately or even solely by women. However, this is an area that needs much further exploration. For future research, important questions about gender roles and user type remain and must be addressed in new studies. These include examining if user types are gender specific, if certain types are predominately one gender or another, and if such gendering of the user types is cohort specific. In addition, it will be important to understand if some of the user types are gendered, how a person's experience and gender interact to make a person hold a gendered type, while other people of the same gender do not become a gendered type. Two immediate ideas for research studies come to mind to answer these questions: one is a study of men from the same birth cohort that seeks to understand if traditionalist and guardian men exist and also a wider interview study with many more participants of various birth cohorts, with a particular focus on recruiting male participants.

A study of all male participants would allow a researcher to actively seek only men. Men were more difficult to recruit for the study. Overall, male older adults do tend to be more difficult to recruit than female older adults (Reich, 1978). Therefore, by concentrating efforts only on males, it will be possible to explore if all these user types exist in the male Lucky Few birth cohort. A wider study of multiple birth cohorts which focused on recruiting men and women could also be used to understand if such user types

are gendered only in certain birth cohorts. Ideally, such initial studies would take a case study approach to determine if these user types exist in men, but then begin exploring these user types in a more quantitative way so that the frequencies of men and women of each type across birth cohorts could be explored.

Given the fact that there is evidence that some male participants who do not use certain ICTs or may have negative feelings towards ICTs may not want to participate in such a study (given the example of Margaret's romantic partner who was resistant to participating) there must be particular attention paid to ensuring that any future studies are not intimidating or off-putting towards male participants with these viewpoints. It may be of benefit if future studies examine ways to present the research such that individuals who do not use such devices do not feel intimidated from participating- perhaps by embedding this study in a larger study of some sort that examines communication or media use and happens to explore ICTs.

### **Reflections on Methodological Choices and Recommendations for Future Work**

The final segment of this chapter reflects on the methodological choices made by the researcher in designing this study, the impacts they had on the study, and the researcher's recommendations for future work which may want to replicate this study or build upon its basic structure. These include lessons learned that may be valuable to future researchers, but also reflections on the surprises, challenges, and benefits of the study described in this dissertation. The table below presents several of the methodological choices that the researcher made in designing this study, the impact and implications that choice had on the research itself, and recommendations by the researcher for future research that wishes to take a similar approach.

**Table 6.2 Methodological Choices, Field Experiences, Impacts, and Recommendations**

<b>Methodological Choices &amp; Field Experiences</b>	<b>Impacts</b>	<b>Recommendations</b>
Qualitative Interpretive Comparative Case Studies Format	Allowed emergent findings (such as user types) to be found	Case study methodology should be applied more in gerontechnology Useful method for understanding under-researched phenomenon
Multi-Interview Method	Allowed the researcher to explore sensitive topics, generate rich stories, and validate findings	Sensitive issues often require an established relationship and multiple sessions to develop Findings should be brought to participants and validated before the study is complete; A transcriptionist can help to lighten the load of analysis between interviews; Some transcription by the researcher can add depth to analysis and understanding; May result in lower participation rates, incentives and a snowball recruiting method can help
Dialogic Method	Allowed researcher to analyze findings within and between the interviews, seek validation for the theory from participants, generate rich stories	Within interview dialogic analysis can create trust and rapport between the researcher and participant; Rich stories are only generated through discussion and follow-up by the researcher (active listening and analysis); Time should be included in the study to discuss and validate findings
Involvement with Primary Participants	Allowed for closeness between researcher and primary participant; Boundaries are necessary; Lonely participants may be attracted to the study and may need special attention	Extra time should be planned for visiting and other tasks- this is particularly true for isolated participants; Friendships can and will develop, which require researcher reflection; The researcher must set clear boundaries for the study and enforce these with participants
Inclusion of Secondary Participants	Difficulty scheduling secondary participants; Higher dropout rate than primary participants; Lack of depth in data	Do not include secondary participants unless their inclusion in the study is central to the research question; Consider and accommodate for secondary participants not being as “dedicated” to the study as primary participants Examine ways to establish rapport with secondary participants/ consider the quality of secondary participant data ahead of time
Surprises and difficult situations often arise in fieldwork	Good surprises and negative ones happen; Individuals may become ill/ have family issues over the course of the study;	Expect the unexpected; Individuals may leave the study for a time period or leave permanently because of life circumstances- this must be accounted for; Researcher safety (both psychological and physical) could mean missed fieldwork opportunities; Account for the researcher becoming “attached” to research participants- traditional close out of the study never really occurs

### *Qualitative Interpretive Case Studies Format*

The choice of a qualitative intensive case studies format has several implications for this research. The power and advantage of such a design is that it allowed emergent findings to be discovered, or as Flyvberg (2006) states, allowed for discovering nuanced reality that otherwise could be uncovered using different methodologies. Both the types and several of the additional findings would not be easy to uncover in a non-interpretive and non-dialogic study. The case study format is far underused in the gerontechnological research (Birkland & Kaarst-Brown, 2010), and it is possible that using a qualitative comparative case studies design to understand older adult ICT use would shed light on areas which have been previously under researched.

### *Multi-Interview Method to Generate Rich Stories*

The multiple interviews that were undertaken with each participant were vital to generating rich and deep stories filled with meaning. The in-depth interviews which spanned several sessions allowed the researcher to explore deeply the meanings and experiences of the older adults in the study. Many of the most critical stories (especially those that were sensitive in nature) did not surface during the initial interview. The most interesting stories that the researcher and the people in the study attributed to influencing their type were told over the series of three primary participant interviews, with the entire story and the emotions involved only being revealed in the final interview after the researcher had established rapport with each of the participants. This was particularly true for individuals who shared negative stories, such as the guardians. For instance, Margaret's story of how the computers influenced her work life

and Natalie's story of how videogames and TV isolated her from her family only emerged in the final interviews with each of them.

The multi-method interview structure also allowed the researcher to examine and delve deeper into questions and areas of previous interviews which she discovered in analysis following the interviews. Often the researcher and the participant had a "give and take" approach throughout the interview process- where the researcher would bring up an event or story discussed in a previous interview and this would often result in a re-telling of the story with more detail and depth (particularly when it came to emotions or logistics) or generated further rich stories. This structure also allowed the researcher to discuss their findings and receive input from the participants during the end of the final interview, not only on the analysis of their own experience and user type, but it also allowed the researcher to discuss her overall findings and emerging theory with participants.

This multiple interview approach took much more time, energy, and investment on both the part of the researcher and the participant. From a practical standpoint, a transcriptionist can help to lighten the transcription load allowing more time for analysis between interviews. However, the researcher found that there was a balance between transcribing some of the transcripts herself (to allow a greater intimacy with the data) and using a professional transcriptionist to allow more time for analysis between the interviews.

The multi-interview structure also took more time on the part of participants. Although most of the people approached were more than willing to participate, it is likely that the time investment (2-3 hours per interview over the course of 3 interviews) did

“scare away” potential participants. The referral/ snowballing method of the interview recruitment and the incentives helped to alleviate these concerns and most of the participants were generous with their time. The referral strategy served two purposes in this regard: potential participants were recruited by someone who knew the researcher well and could vouch for her. Some of the potential participants knew another participant in the study who could vouch for the time commitments and experience. It was very rare that a possible “lead” on a primary participant led to the participant not being in the study, possibly due to the potential lead being well versed and able to ask questions about the study to the referrer. Incentives were also beneficial in recruiting and maintaining participants in the study. Since participants received one gift card per interview, it was more likely that they would return for the next interview knowing that there was a gift card offered if they participated.

#### *Choice of Dialogic Method*

The use of the dialogic method was also helpful to developing rapport and helping the researcher to truly understand the underlying emotions and meanings that participants gave to ICTs. First, many participants commented on the style of the interviews, with Mary stating “Oh, this is just like therapy! You are so soothing to talk to and you really listen.” Many of the other participants commented on how understanding and reflective the researcher was during the interview process. The dialogic method itself is a form of “active listening” (Denzin, 2001) in the sense that the interviewer must listen intently and reinterpret meaning to the participant and this likely helped to develop rapport with the participants. Secondly, by reinterpreting the meaning back to the participant, this not only

allowed them to feel listened to, but also allowed me to verify meanings and interpretations with the participant.

In several cases (particularly when developing the theory) I would use a portion of the last interview to share the theory and check for the participant's validation of where I believed the participant fit into the theory as far as user type. This was particularly valuable when editing the final version of the theory and confirming specific terms and meanings that were incorporated into the theory.

Without using the case study multiple interview dialogic design, this study would not have not been able to generate the rich stories necessary to build (and then confirm) the theory of user types.

#### *Involvement with Primary Participants*

One of the things that I did not predict was how involved I would get in several of the research participant's lives. Several of the primary participants are still in close contact. These contacts, including the occasional note or phone call let me know how former participants are doing. This required me to reflect on how these relationships might impact the findings.

Several of the primary participants also grew quite attached and resulted in my investing extra time into the relationship with the participant. One of the participants who became quite attached was Natalie, who was quite lonely and had a tendency to monopolize my time. At the end of each interview, Natalie would get quite sad and state something like "I thought we could have lunch together" or "I thought we could go shopping together." I tried to spend some time chatting with Natalie after each interview to ease the transition of leaving, but could not commit to spending the day with her

because of work and research constraints. When I had finished my allotted time to spend visiting, Natalie would become quite upset, and even to the point of rudeness (criticizing the research, stating that she did not know why anyone would participate, and even picking on my interview skills or personal traits, etc.).

Natalie also occasionally (perhaps 10 times over the course of the study) called me to come to her house for technical help or to try to set up dinner, lunch, or shopping excursions. While several of the participants loved to chat, (some were lonelier than others, while some participants just liked to talk), none were quite as extreme as Natalie.

There is potential for the researcher who works with older adults to run into participants like Natalie, who are quite lonely and need extra social support. This should be strongly considered by any researcher looking to invest time into a study like this. As a result of the multiple interview format, these interviews were seen by both the participant and myself as forging a relationship, rather than just participating in a one-time interview. For some of the participants, like Natalie, this relationship was more important than for other participants. For the researcher this has several practical implications: the researcher must be firm at saying no to requests that fall inappropriately outside of the scope of the researcher/ participant relationship and the researcher needs to schedule extra time to compensate for chatting and socializing with the participant. Being able “to visit” is a benefit of the research to those who participate and are more lonely or isolated. Therefore, while it is important to set limits (for instance, I can visit for a half an hour to an hour) it is also important to schedule time to allow for such visiting to take place (and allowing for that hour between appointments).

### *Inclusion of Secondary Participants*

Much of the findings from this study come from the interviews with the primary participants. However, many interviews were conducted with secondary participants who were family members, friends, neighbors, and colleagues of the primary participants. The interviews with the secondary participants did lend important data that helped to understand how different birth cohorts (particularly younger birth cohorts) viewed the Lucky Few's use and did provide a certain amount of triangulation on the Lucky Few primary participant's use. However, the secondary participants represented the most difficult part of the data collection portion of the study.

For many of the cases, secondary participants could not be recruited. For all of the cases potential secondary participants were contacted and attempts made to recruit these participants were made; however, many of the potential secondary participants refused to take part in the study, or more commonly, did not return phone calls or failed to "show" for scheduled interviews.

I would call and email (if appropriate) the potential secondary participants five times over the period of several weeks, calling both evenings and days; weekdays and weekends. Many potential secondary participants did not return or answer these calls. Primary participants were also encouraged and told to contact their potential secondary participants, which most did. Among the secondary participants who were scheduled for phone interviews, I often found that these interviews needed to be rescheduled, despite reminder phone calls (interviews were rescheduled a maximum of three times).

Interruptions occasionally occurred which cut the phone interviews short or required that the interview be divided into sections over multiple phone calls, with each

additional phone call necessary resulting in a greater likelihood that the interview would not be completed. Several potential secondary participants agreed to participate in an interview, an interview was scheduled, and the secondary participant was a “no show” for the interview, and I was not able to get in touch with the potential secondary participant again, despite numerous phone calls. For several potential secondary participants, they were scheduled three times for interviews, but failed to “show” (answer the phone) for each one.

Several secondary participants also refused to return their signed incentive forms (despite numerous reminders) for the study. In the case of secondary participants who were interviewed on the phone, gift card incentives were sent in the mail with a self-addressed stamped envelope back to the researcher), which resulted in paying this expense out of pocket (as signed incentive forms were required by funding).

Overall, this caused much work to include the secondary participants in the study compared to the time spent recruiting, interviewing, and scheduling the primary participants in the study. If I was conducting this study again, I would consider not including the secondary participants in the study. Although some interesting findings were found because the secondary participants were included, these findings did not outweigh the expense, time, and effort that the secondary interviews required. The secondary interviews tended to have weaker data (as opposed to the rich data from the primary participants) as well, due to their length and the lack of rapport that had been established between the secondary participant and myself. Several secondary participants were extremely guarded in their interviews as they feared that sensitive statements that they made would be repeated back to the primary researcher or that the researcher could

possibly create issues for the primary participant.<sup>19</sup> All of this meant that the researcher felt that the secondary interviews resulted in little data for the amount of effort it took to include the secondary participants.

I would recommend that future researchers consider these negatives to including secondary participants in such a study. If the inclusion of secondary participants is considered necessary or central to answering the research questions, ways to increase rapport and dedication of the secondary participants should be considered. Additionally, given the fact that secondary participant data tends to be less rich than primary participant data, this should be considered when constructing research questions that rely on secondary participant information.

### **Field Work Experiences: Gifts, Pyramid Schemes, and Drunken Neighbors**

Fieldwork requires that the researcher be flexible and prepared for surprises. It often requires flexibility on the part of the researcher to capture data (Van Maanen, 2011). Field work often comes with specific challenges. Over the course of the study, several interesting events happened in the field. The first of these experiences was quite delightful, which was that I received several beautiful gifts from participants, including

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<sup>19</sup> Both of Natalie's secondary participants were guarded, evasive, and overly suspicious of the researcher's intent during their interviews. One of the secondary participant's described Natalie's home as messy, but I did not view her home until the third interview (we met at a café for Natalie's first two interviews because she was uncomfortable letting me into her home). I believe that these secondary participants may have been fearful that the researcher would "turn in" Natalie for being a hoarder to a social worker or possibly some other agency. Natalie's home was indeed a mess (and she did seem to fit the definition of a hoarder of stuff), with her stating that once her husband and son left, she "filled their rooms with stuff- and then proceeded to stuff the rest of her house." Due to boxes and furniture on the stairs, it appeared that Natalie was unable to enter her living room or her upstairs in her home.

The researcher reflected on Natalie's situation for a long time following the third interview and came to the conclusion that Natalie seemed: 1. Relatively well adjusted without risk of harming herself or others; 2. She had two exits from her home that were easily accessible in case of fire despite the clutter; 3. Her home was amazingly clean for the amount of materials contained within it including a very clean food preparation area and bathroom; 4. She appeared to clean, showered, and dressed in clean clothes for each interview. Therefore, although the contents of Natalie's home bothered the researcher and made the researcher feel quite sorry for Natalie, the researcher felt that Natalie was not a threat to herself and her home was not a threat to her safety.

handmade cards, scented candles, a water bottle, and a handmade stained glass decoration of a bluebird. It often seemed that participants felt that they needed to repay me for the gift card incentives they had received with a small gift, which they often presented at the last interview with fanfare.

Less pleasant surprises often occurred as well. The most notable of these came when interviewing a secondary participant, whom I had hoped would serve as a referral to more male participants due to his connections in his community and knowing several Lucky Few males. Paul (friend of Boris and coworker) was interviewed in his home. The first warnings that something was amiss happened when Paul asked during the interview, “I have my own business by the way, which I’d like to talk to you about, when you get done.” I immediately became suspicious because it sounded like a business pitch. At the end of the interview, the participant tried to convince me to join a pyramid scheme disguised as a power company with a high pressure sales pitch. I politely took his materials, made an excuse as to who handled bills in my family, and quickly left. Boris later told me that Paul wanted me to call him, but Boris felt his friend was just trying to convince me to sign up for the “pyramid scheme.” I chose not to further contact Paul (despite his request through Boris), following Boris’ advice.

Since data collection for this study took place over about a two month time period for each participant, many of the participants had significant life experiences that happened during the study. For instance, Harry’s wife was dealing with cancer, Dan lost a son, and Jackie was in the process of moving into a travel trailer. Being flexible and understanding in collecting data was key to ensuring that these participants could continue the study. In addition, such life events could have resulted in participants

leaving the study, which any researcher needs to account for. Unlike single interview studies, life events are more likely to occur over the several month time span that occurred in this study, and therefore more likely to impact data collection. When seeking cases, particularly if the researcher does not have much flexibility in the data collection time frame, the researcher should account for some possible participant loss.

In a fieldwork study, there are other considerations to be made. The vast majority of the interviews in this study occurred in person (all primary participants were interviewed in person) at the participant's home. Using the referral strategy tended to ensure my safety as it was unlikely that a contact would refer me to a participant who might be dangerous.<sup>20</sup> For researchers who choose to replicate this study, this emphasizes another benefit of using a referral strategy, particularly if the study is to take place in non-public spaces, such as the participants' homes.

The final reflection on this study is that true "close out" with participants never really occurs because of the high levels of interaction between the participants and researcher during data collection. Most of the participants are still in contact. Such

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<sup>20</sup> Oftentimes, however, participants themselves became concerned for my safety. During the first interview with Gwen, a drunken neighbor interrupted the interview. Gwen lived in section 8 housing and this as she explained, "attracts all sorts of bad people." A woman, obviously intoxicated and possibly under the influence of illegal drugs, began pounding on Gwen's door, looking for a place to stay because her boyfriend had kicked her out. Several of the apartment complex children were with the intoxicated woman, which concerned Gwen. Gwen convinced the woman she had to leave the building, and to go to a local business that would help her. We watched the woman leave the complex from Gwen's apartment window. She later told me that she would not call the police, as the children who were with the woman (friends of the woman's son) likely did not have a parent at home. As she told me, "If a white cop sees these little black kids without a parent to watch them he'll put them in foster care faster than you can say it. At least if they stay here I can watch them and give them snacks to make sure they get something to eat every day. Black children in foster care don't tend to do well." As a result of that incident, Gwen insisted in walking me out to my car to ensure that I was safe when leaving the building. I found this experience to be interesting, as I was very comfortable at Gwen's apartment complex and considered it to be quite similar to a previous complex I had lived in nearly a decade before. Although I felt quite safe there, since it seemed to reassure Gwen to walk me to my car, I allowed her to do so and made sure she reentered the building before I left the parking lot. I decided to trust her judgment of her neighborhood to be better than my own.

contact could prove beneficial in the future in helping to re-examine participants' ICT use as they age. Many of these relationships have developed into friendships. Researchers who decide to undertake such a study must be prepared that close out in the study never really occurs (although they may earn a few new friends in the process).

This final chapter has reviewed some of the choices, limitations, future research, and reflections on the research process. Overall, the study was successful beyond what I could imagine. I hope that this study will inspire more researchers to begin exploring older adult ICT use and this theory of User Types. For those researchers already working in the area, I encourage you to consider older adult experiences with ICTs *beyond* ability and functional levels. This broader perspective is critical to understanding the impacts such ICTs have in older adults' everyday lives.

### *Appendix A. Glossary*

**Birth Cohort:** A group of individuals born in a single time period that experience historical events at similar age. (Carlson, 2009)

#### **Birth Cohorts/ Generations Recognized in the United States**

<b>Birth Cohort Name</b> (Carlson, 2009)	<b>Years of Birth</b>
The Good Warriors (World War II Generation)	1909-1928
Lucky Few	1929-1945
Baby Boomers (Boomers)	1946-1964
Generation X	1965-1982
Generation Y (Millennials/New Boomers)	1983-2001

**Case Study:** Case studies are a methodology that allows researchers to understand rich contextual impacts on a phenomenon (Flyvberg, 2006). Case studies can use a variety of methods to obtain information about this rich context, such as interviews, observation, and focus groups (Yin, 2009).

**Case Comparisons:** The goal of comparisons is to understand the similarities and the differences in the cases. Three different types of case comparisons will be completed in this case:

<b>Within Case Comparisons</b>	<b>Between Case Comparisons</b>	<b>Across Case Comparisons</b>
Comparisons within single cases across different life contexts and across primary and secondary participants  These results will then be compared to other cases	Comparisons between cases outcomes due to theoretical case sampling constructs (gender and work)	Comparisons across cases, comparing cases that differed in outcomes as far as usage, display, meaning of ICTs, and life satisfaction (exploring possible independent variables that may have caused these outcomes, although these variables were not used as sampling constructs)

**Community Context:** Involvement in activities that are not purely leisure, work, or family orientated. This includes governmental/ citizen activities (such as voting) and other activities such as religious worship or belonging to a neighborhood association.

**Domestication:** A theory that proposes that ICT use is complex, and that contextual and social factors influence use. Domestication proposes that adoption of an ICT is a process, which involves the introduction of an ICT, how the ICT is used (including routines of use), the display of the ICT, and the meaning of the ICT to the individual and their family and friends (Silverstone, 1994, 1999, 2007; Silverstone & Haddon, 1996; Silverstone & Hirsch, 1994).

**Family Context:** Individuals who are related to one another.

**Gerontechnology:** An area of study that explores aging issues and technologies (including ICTs). In this study, the phrase “gerontechnology literature” refers to all studies that examine aging and ICTs, regardless if the researcher(s)’ entire research agenda centers on aging and ICTs.

**ICTs:** Information and Communication Technologies. ICTs are technological artifacts which are used in order to enable communication or information sharing between individuals or between individuals and organizations.

**ICT Form:** Different types of Information and Communication Technologies. For instance, television is a different “form” of an ICT than the telephone or radio.

**ICT version:** Within an ICT form there are different versions, or updates to an ICT. For instance, LCD televisions represent a later and newer version of the television than CRT televisions.

**Leisure:** Activities or hobbies that are done to pass time or for fun.

**Life Contexts:** Areas of the older adult’s lives that may influence ICT usage. The most explored of these contexts has been the family, followed by leisure and work. Another important life context is community. Relationships and tasks within each of these contexts are considered to be important influencers on the domestication of ICTs.

**Literal Replication:** Case study methodology in which cases are selected based upon theoretical case sampling constructs so that it is expected that the results will be similar (Yin, 2009).

**Lucky Few:** Birth-cohort born from 1929-1945 (Carlson, 2008, 2009).

**Meaning:** Meaning refers to the significance, consequences, and purpose of events, experiences, and activities for individuals (Denzin, 2001).

**Older Adult:** An older adult is typically thought of as a person who is age 65 or older. For this study, the specific population of older adults considered were members of the Lucky Few birth-cohort that lived in the northeastern United States for at least 7 months of the year.

**Primary Participant:** Older adults who meet the selection criteria of age, work, and gender.

**Secondary Participant:** A member of the older adult’s personal network, it could be a friend, coworker, family member, neighbor, etc. For each older adult, 2-3 secondary participants will be interviewed, each for approximately an hour. These

interviews seek to understand differences in expectations between older adults and their network.

**Theoretical Replication:** Case study methodology in which cases are selected based upon differing theoretical case sampling constructs so that it is expected that the results will be different, determining the impacts of theoretical constructs on the case outcomes (Yin, 2009).

**Work:** Eight or more hours of paid activity on a weekly basis.

**Work Status:** If a person is working (including full or part-time), retired, or has chosen to stay at home currently.

**Work Trajectory:** The accumulation of a person's work choices and positions over their lifetime to the present day.

**Appendix B. Data Collection Methods**

Table B.1 Description of Semi-Structured Interview Method: Purpose of inclusion in the study, data generated by each method, and the pros and cons of each method

Method		Purpose & Rational	Data	Type of Data	Pros	Cons	
Semi-Structured Interviews with Older Adults	<i>Initial Interview</i>	Review Study	General Understanding of Older Adults' Life Contexts	Rich Interview Data in the older adults' own words.	Can understand meaning of ICTs to older adults	Relies on Participant's Memory	
		Obtain Informed Consent	List of ICTs Used				
			List of ICTs Not Used				
			Technologies Considered, but not used (or abandoned)				
		Introduce myself and participant	Definitions of ICTs, Examples of ICTs and non-ICTs		Dialogic interpretation of meanings	Data collection is retrospective	
			First Exposure to ICTs				
		Understand ICTs used, not used, abandoned, and reasons why	Contexts of First Exposure; Tasks that Influenced First Exposure; Relationships that Influenced First Exposure		Can understand older adults' perceptions of ICTs in various life contexts		Only understands the older adults' perceptions of the challenge and advantages/disadvantages of use
			Task and Relationship impacts on Use and Non-Use				
		Understand impacts on ICT use (tasks and relationships)	Advantages and Disadvantages of Use/Non-Use				
			Meanings of ICT usage/ non-usage				
Understand first exposure of older adults to ICTs	Change in ICT Meanings Over Time						
	Reasons for ICT use						
	Challenges in ICT use						
Understand meanings of ICTs to older Adults	Stories about unsuccessful use	Can understand older adult's view point of the challenges and disadvantages/	Obtain only older adults' perceptions of what ICTS are capable of or information that				
	Resources needed for successful use						
Understand advantages/	Resources No Longer Available, but Determined Necessary						

		disadvantages, and challenges of ICT use/ non-use	Basic Demographic Information: Education (Formal and Informal), Work History Life History and Biography		advantages of ICT usage; dialogic interpretation	exists (which may be different from what ICTs are capable of)
<b>Method</b>		<b>Purpose &amp; Rational</b>	<b>Potential Data</b>	<b>Type of Data</b>	<b>Pros</b>	<b>Cons</b>
<b>Semi-Structured Interviews with Older Adults</b>	<i>Second Interview</i>	Understand older adult's life contexts of family, leisure, community, and work.	How ICTs are Used by Older Adults in Family, Friendship and Community Contexts	Rich Interview Data in the older adults' own words	Allowed me to re-examine issues that emerge after initial interview analysis	Relied on Participant Memory
			Important Family, Work, Community, and Leisure Contexts			
			Differences and similarities between ICT usage in various life contexts			
		Understand older adult's use of ICTs in life contexts of family, leisure, community, and work	Conflict, Compromise, and Negotiation in Relationships over ICT usage/ non-usage		Allowed older adults to reflect on usage and may improve accuracy	
			Stories of ICT Use			
			Meanings of ICTs in these contexts			
		Understand difference in older adult's use of ICTs in different life contexts.	Documents Used in ICT use & their meaning		More accommodating for older adults who have cognitive or physical issues that would make multiple interviews impossible or uncomfortable	
			Tasks and Relationships that Influence Use			
			Consequences of Use/Non-Use			
		Develop rapport with older adult, which may be helpful for obtaining secondary participants	Advantages and Disadvantages of Use/Non-Use in these Contexts		Procedure may have led to increased ICT usage (contamination due to my presence)	
			Differences and similarities between ICT usage in various life contexts			
			Resources that are Important			
		Determine potential secondary participants	Technologies Considered, but not used (or abandoned)		Limited to older adult perceptions of their technological capability	
			Conflict in Relationships over ICT usage/ non-usage			
Examine display of ICTs, discuss the meaning of this display to older adults	Impacts of usage/ non-usage on volunteering and work					
	Meanings of ICT usage/ non-usage					
	Display of ICTs					
	Meaning of documents used in Use of ICTs					
			Reasoning for Display of ICTs			

		Allow further discussion of issues that emerge from preliminary analysis	Conflicts, Compromise, and Negotiation over Display (placement and use) Likes and Dislikes of Display Explore emerging meanings from previous interview		Facilitated development of rapport with older adults	
<b>Method</b>	<b>Purpose &amp; Rational</b>	<b>Potential Data</b>	<b>Type of Data</b>	<b>Pros</b>	<b>Cons</b>	
<b>Semi-Structured Interviews with Older Adults</b>	<i>Third Interview</i>	Explore issues that emerge from the interview with secondary participant including sources of ICT expectation conflict	Older adult's own expectations of their use	Rich Interview Data in the older adults' own words.	Was able to more fully explore technologies that were considered or used	Relied on Participant Memory
			Older adults' generational expectations of others in a similar birth-cohort (the Lucky Few)			
			Stories of Conflict, Compromise, and Negotiation in ICT usage			
			Older adults' expectations of others in dissimilar birth-cohorts (Baby Boomers, Generation X, and Generation Y)			
		Explore Older Adults Expectations for their own usage	Older adults' perceptions of others' expectations for their usage		Was able to understand if expectations are shared or different	I needed to be careful not to negatively impact the relationship between the older adult and the secondary participant
			Impacts of ICT Expectations on the Older Adult's Life			
		Explore ICTs discovered through interviews with secondary participants	Effects of relationship on their use and exposure			
			Advantages/ Disadvantages/ Challenges of Use			
		Create closure with the participant	Emerging issues from previous interviews.			
			How ICT impacts life satisfaction			
<b>Semi-Structured Interviews with Older Adults'</b>	Understand older adults exposure to technologies through relationships	Understand relationship(s) between the older adult and the network individual	Rich Interview Data	Was able to see how others perceive older adults ICT usage	I needed to be careful not to negatively impact the relationship between the older adult and the secondary participant	
		ICTs used in their relationship with the older adult				
		ICTs considered but not used or abandoned				
		Technological Exposure (through the relationship to the older adult).		Was able to determine		

		Expectations concerning the older adult usage/ non-usage in this role		secondary participants' expectations	Only could obtain secondary participants' perceptions of the older adult and their usage
		Stories of Use			
	Understand what ICTs have been used, tried, or considered	Advantages/ Disadvantages of use or non-use of ICTs		Served as a second data point for ICT usage by the older adult	
		Conflicts, Compromise, and Negotiation over ICT usage or non-usage			
		If applicable, understand this individual's thoughts about the older adult's display of relevant ICTs			
	Understand others' expectations for older adults usage	Generational Differences between Expectations			
Impact of ICT usage on life satisfaction					

Table B.2 Description of Documents and Photographic Evidence: Purpose of inclusion in the study, potential data generated by each method, and the potential pros and cons of each method

Method	Purpose & Rational	Potential Data	Type of Data	Pros	Cons
Documents	To provide factual evidence about what is available and possible and sort out impressions versus reality	Differences between perceptions and reality	Physical evidence	Helped to understand Fact versus Impressions about what is available/ possible	Does not indicate Older Adults' Perceptions
		ICT limits			
		Common misunderstandings		Indicated Gaps in ICT knowledge	Materials that are available may change over time
Photographs	To provide visualization of ICTs used and aid in analysis	Photographs of Index Cards Indicating ICTs Used	Visual Evidence	Helped in analyzing interview about display	Did not indicate the older adult's perspective
		Photographs of Index Cards Indicating ICTs Tried but Abandoned			
		Photographs of Index Cards Indicating ICTs Wanted to Try		Helped in visualization for the older adults	Devoid of Meaning to Participant
		Photographs of Index Cards Indicating ICTs Used in Each Life Context			Could not capture context (History or Biography)
	To provide visualization of display of ICTs to aid in analysis	Photographs of the Display of ICTs	Visual Evidence	Helped in analyzing text	Devoid of Meaning to Participant
		Photographs of "Cheat Sheets" or other aids			Does not indicate the older adult's perspective
				Cannot capture context (History or Biography)	

*Appendix C. IADL Questionnaire*

INSTRUMENTAL ACTIVITIES OF DAILY LIVING SCALE (IADL) (Lawton & Brody, 1969)

<p>A. <u>Ability to use telephone</u></p> <ol style="list-style-type: none"> <li>1. Operates telephone on own initiative; looks up and dials numbers, etc. 1</li> <li>2. Dials a few well-known numbers. 1</li> <li>3. Answers telephone but does not dial. 0</li> <li>4. Does not use telephone at all. 0</li> </ol>		<p>B. <u>Laundry</u></p> <ol style="list-style-type: none"> <li>1. Does personal laundry completely 1</li> <li>2. Launders small items; rinses stockings, etc. 0</li> <li>3. All laundry must be done by others. 0</li> </ol>	
<p>C. <u>Shopping</u></p> <ol style="list-style-type: none"> <li>1. Takes care of all shopping needs independently. 1</li> <li>2. Shops independently for small purchases. 0</li> <li>3. Needs to be accompanied on any shopping trip. 0</li> <li>4. Completely unable to shop. 0</li> </ol>		<p>D. <u>Mode of Transportation</u></p> <ol style="list-style-type: none"> <li>1. Travels independently on public transportation or drives own car. 1</li> <li>2. Arranges own travel via taxi, but does not otherwise use public transportation 1</li> <li>3. Travels on public transportation when accompanied by another 1</li> <li>4. Travel limited to taxi or automobile with assistance of another. 0</li> <li>5. Does not travel at all. 0</li> </ol>	
<p>E. <u>Food Preparation</u></p> <ol style="list-style-type: none"> <li>1. Plans, prepares, and serves adequate means independently 1</li> <li>2. Prepares adequate meals if supplied with ingredients. 0</li> <li>3. Heats, serves, and prepares meals or prepares meals but does not maintain adequate diet. 0</li> <li>4. Needs to have meals prepared and served. 0</li> </ol>		<p>F. <u>Responsibility for own Medications</u></p> <ol style="list-style-type: none"> <li>1. Is responsible for taking medication in correct dosages at correct time. 1</li> <li>2. Takes responsibility if medication is prepared in advance in separate dosage. 0</li> <li>3. Is not capable of dispensing own medication. 0</li> </ol>	
<p>G. <u>Housekeeping</u></p> <ol style="list-style-type: none"> <li>1. Maintains house alone or with occasional assistance (e.g. "heavy work domestic help") 1</li> <li>2. Performs light daily tasks such as dishwashing, bed making 1</li> <li>3. Performs light daily tasks but cannot maintain acceptable level of cleanliness 1</li> <li>4. Needs help with all home maintenance tasks. 1</li> <li>5. Does not participate in any housekeeping tasks. 0</li> </ol>		<p>H. <u>Ability to Handle Finances</u></p> <ol style="list-style-type: none"> <li>1. Manages financial matters independently (budgets, writes checks, pays rent, bills goes directly to bank). 1</li> <li>2. Manages day to day purchases, but needs help with banking, major purchases, etc. 1</li> <li>3. Incapable of handling money 0</li> </ol>	

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