

DEVELOPING THE HEALTHCARE TECHNOLOGY ACCEPTANCE MODEL (H-TAM)  
FOR OLDER ADULTS

BY

MAURITA TIFQUWANA HARRIS

THESIS

Submitted in partial fulfillment of the requirements  
for the degree of Master of Science in Community Health  
in the Graduate College of the  
University of Illinois at Urbana-Champaign, 2019

Urbana, Illinois

Master's Committee:

Professor Wendy A. Rogers, Advisor  
Assistant Professor Shannon Mejia  
Associate Professor Andiara Schwingel

## ABSTRACT

As life spans increase, many older adults are managing one or more chronic diseases at a time. Healthcare Technologies (HCTs) are a possible solution to support this population as they self-manage through monitoring and maintenance. For HCTs to help older adults, they must first be willing to use the technology. The purpose of the research was to understand what factors emerged when older adults considered using new HCTs, how well current models of technology acceptance represented these factors, and to understand how these factors differ between HCTs. Twenty-three participants with hypertension between the ages of 65-84 completed a semi-structured interview to gain insight into factors that emerged that may influence their intentions to use HCTs. During the interview, participants were presented with a scenario and one of three HCTs (blood pressure monitor, electronic pillbox, and multifunctional healthcare robot) to consider. A coding scheme categorized responses in MAXQDA to assess the frequency with which different factors were mentioned. Six factors in the context of HCTs that older adults considered that are not in previous models of technology acceptance: familiarity, perceived need, perceived benefit, advice acceptance, privacy, and trust. Based on the qualitative data, a conceptual model of the Healthcare-Technology Acceptance Model (H-TAM) for older adults was created to describe these factors as they relate to the factors from the literature. These findings provide insights about older adults and their intentions to accept or not accept HCTs that can inform dissemination of new technologies.

*To my grandmother Nelvia (Rita) Campbell and my late great-grandmother Hursie Spencer.*

## **ACKNOWLEDGMENTS**

This research was supported in part by a research supplement grant from the National Institute of Health (National Institute on Aging) Grant P01 AG17211 under the auspices of the Center for Research and Education on Aging and Technology Enhancement (CREATE).

I would like to thank Dr. Wendy Rogers for her guidance, patience, and support. I would also like to thank Olivia Kupiec, Danniell Rhee, and Claire Textor for your assistance on this project. Lastly, I would also like to thank the members of the Human Factors and Aging laboratory, family, and friends for your support and guidance.

## Table of Contents

CHAPTER 1: INTRODUCTION .....	1
CHAPTER 2: LITERATURE REVIEW .....	3
<b>2.1 Behavioral Intentions</b> .....	6
<b>2.2 Perceived Usefulness</b> .....	8
<b>2.3 Perceived Ease of Use</b> .....	9
<b>2.4 Social Influence</b> .....	11
<b>2.5 Facilitating Conditions</b> .....	11
<b>2.6 The Inclusion of Older Adults</b> .....	12
<b>2.7 Advice Acceptance</b> .....	12
<b>2.8 Facilitators, Barriers, and Transitions</b> .....	13
CHAPTER 3: OVERVIEW OF STUDY .....	14
CHAPTER 4: METHODOLOGY .....	18
<b>4.1 Participants</b> .....	18
<b>4.2 Measures</b> .....	20
<b>4.3 Procedure</b> .....	27
CHAPTER 5: ANALYSIS .....	29
<b>5.1 Quantitative</b> .....	29
<b>5.2 Qualitative</b> .....	29
CHAPTER 6: RESULTS.....	32
<b>6.1 Characteristics of Participants</b> .....	32
<b>6.2 Factors Mentioned Related to Intentions to use HCTs</b> .....	34
<b>6.3 Differences Between Technology</b> .....	39
<b>6.4 Healthcare Technology Acceptance Model</b> .....	45
CHAPTER 7: DISCUSSION .....	49
<b>7.1 Summary of Results</b> .....	49
<b>7.2 Limitations and Future Directions</b> .....	53
CHAPTER 8: CONCLUSIONS .....	54
REFERENCES.....	55
APPENDIX A–UNIFIED THEORY OF ACCEPTANCE AND USE OF TECHNOLOGY 2.....	59
APPENDIX B – SENIOR TECHNOLOGY ACCEPTANCE MODEL .....	60
APPENDIX C - IRB PACKET.....	61

APPENDIX D - CODING SCHEME..... 119

## CHAPTER 1: INTRODUCTION

It is projected that older adults in the United States, 65 years and older, will equate to 83.7 million by 2050, compared to 43.1 million in 2012 (Ortman, Velkoff, & Hogan, 2014). These longer life spans mean that more people are living with age-related health conditions, such as chronic diseases for more extended periods of time.

Chronic diseases defined by the World Health Organization website (WHO; 2017) are “...not passed from person to person. They are of long duration and generally slow progression. The four main types are cardiovascular diseases (e.g., heart attacks and stroke), cancers, chronic respiratory diseases (such as chronic obstructed pulmonary disease and asthma) and diabetes.” Chronic diseases are the leading causes of death and disability in the US, leading to 7 of 10 deaths in 2014 (CDC, 2016). Older adults are at a higher risk of developing a chronic disease and accumulating multiple chronic diseases at once resulting in risk of dying prematurely, being hospitalized, and poor day-to-day functioning if not managed (CDC, 2016).

Hypertension, also known as high blood pressure or the silent killer, is one of the top chronic conditions that an older adult can experience. Hypertension is “a common disease in which blood flows through blood vessels, or arteries, at higher than normal pressures.” (National Heart, Lung, and Blood Institute, n.d.). Participants with the baseline age of 55 and 65 in the Framingham Heart Study between 1976-1998, had a residual lifetime risk of 90% for developing hypertension at some point during the rest of their lives (Vasan et al., 2002). The residual lifetime risk can be illustrated as a long-term risk for developing hypertension. One way to help prevent or reduce high blood pressure is by adopting a healthier lifestyle (e.g., eating a healthy diet and physical activity) through self-management of one’s health. Healthcare technologies (HCTs) are another solution that can help older adults self-manage their hypertension by

supporting them in monitoring and maintaining their health as the possibility of developing multiple chronic diseases increase.

HCTs allow individuals to manage aspects of their health, such as medication management, medical appointments, health records, exercise, and nutrition. For example, individuals who cannot see a doctor as recommended may use a telehealth system to see their doctor. HCTs provides many benefits for the individual (e.g., increase the quality of life) and society by increasing access to health information and healthcare providers. With the increase of technology usage among adults that are 50+ (Kakulla, 2019), it is essential to understand the intentions, or the willingness, to accept technology to ensure acceptance so that the technologies can enhance their health. By understanding the factors, and the components that define them, that influence older adults' intentions to use HCTs, there will be a better understanding on how to ensure acceptance of the technology in older adults' daily routine.



## CHAPTER 2: LITERATURE REVIEW

Consider the case of Ms. Spencer, a 70-year-old woman, who has type 2 diabetes. She was recently diagnosed with hypertension by her doctor, who recommended that she manage her health better by using a HCT that can support her lifestyle changes. What are the factors that influence her intentions to use the HCT? There are various models of technology acceptance that illustrates the plethora of factors that influence behavioral intentions and acceptance. Table 1 illustrates some of the factors in current technology acceptance models. As is evident from the table, there are a lot of potential influences on intention decisions. Less clear, however, is which factors are most relevant to older adults making decisions about HCTs.

Table 1

### *Influential Factors Related Technology Acceptance*

Factors	Definition	The model that includes the factor
Attitude (towards use/behavior)	<p>“an individual’s positive or negative feelings (evaluative affect) about performing the target behavior” (Fishbein and Ajzen, 1975, p. 215)</p> <p>“An individual’s positive or negative feelings or appraisal about using gerontechnology” (Chen &amp; Chan 2014; p. 639)</p>	TRA, TPB, STAM
Effort Expectancy	<p>“the degree of ease associated with the use of the system.” (Venkatesh et al., 2003, p. 450)</p> <p>(See PEOU)</p>	UTAUT

Table 1 (Cont.)

Performance Expectancy	“the degree to which an individual believes that using the system will help him or her to attain gains in job performance.” (Venkatesh et al., 2003, p. 447) (See PU)	UTAUT
Social Influence	“the degree to which an individual perceives that important others believe he or she should use the system.” (Venkatesh et al., 2003, p. 451) (See SN)	UTAUT
Subjective (Social) Norm	“the person’s perception that most people who are important to him think he should or should not perform the behavior in question.” (Fishbein and Ajzen 1975, p. 302)	TRA, TPB, TAM
Perceived Usefulness	“the degree to which a person believes that using a particular system would enhance his or her job performance.” (Davis 1989, p. 320)	TAM, STAM
Perceived Ease of Use	“the degree to which a person believes that using a particular system would be free of effort” (Davis 1989, p. 320)	TAM, STAM
Facilitating Conditions	“the degree to which an individual believes that an organizational and technical infrastructure exists to support use of the system.” (Venkatesh et al., p. 453) (See PBC)	UTAUT, STAM

Table 1 (Cont.)

Perceived Behavioral Control	<p>“the perceived ease or difficulty of performing the behavior” (Ajzen, 1991, p. 188)</p> <p>“Conditions associated with the perception of objective factors in the environment that support usage of gerontechnology” (Chen &amp; Chan 2014; p. 639)</p>	TPB, STAM
Usage Behaviour/Behavior Use	Self-reported use of technology over 12 months prior to the interview (Chen & Chan 2014)	STAM
Gerontechnology self-efficacy	A sense of being able to use gerontechnology successfully (Chen & Chan 2014; p. 639)	STAM
Gerontechnology anxiety	An individual’s apprehension when he or she is faced with the possibility of using gerontechnology (Chen & Chan 2014; p. 639)	STAM
Hedonic Motivation	“the fun or pleasure derived from using a technology.” (Venkatesh et al., 2012, p. 161)	UTAUT2
Price Value	“consumers’ cognitive tradeoff between the perceived benefits of the applications and the monetary cost for using them.” (Venkatesh et al., 2012, p. 161 – derived from Dodds et al. 1991)	UTAUT2
Experience	The passage of time from the initial use of a technology by an individual (Venkatesh et al., 2012, p. 161)	UTAUT2
Habit	Prior behavior and automatic behavior (Venkatesh et al., 2012, p.161)	UTAUT2

## 2.1 Behavioral Intentions

By knowing the factors that influence, or motivate, one's intentions, designers and researchers can address those factors to promote acceptance of the technology and later adoption. Behavioral intentions can be defined as "indications of how hard people are willing to try, of how much of an effort they are planning to exert, in order to perform the behavior (Ajzen, 1991; p. 181)." If one's behavioral intentions are high, then they are more likely to engage in that behavior later.

In the technology acceptance literature, intentions have been well-established as a predictor of actual acceptance and usage of technology (Venkatesh, Morris, Davis, & Davis, 2003), predicting actual usage once the technology is implemented into their lives (Szajna, 1995). Two relevant models that address what considerations lead to acceptance are The Unified Theory of Acceptance and Use of Technology 2 (UTAUT2; Venkatesh, Thong, & Xu, 2012) and the Senior Technology Acceptance Model (STAM; Chen & Chan, 2014).

The Unified Theory of Acceptance and Use of Technology 2 (UTAUT2; Venkatesh, Thong, & Xu, 2012; See Appendix A) is an extension of UTAUT (Venkatesh et al., 2003) focusing more on a consumer use context rather than an organizational context. Originally, UTAUT was created by reviewing eight different theories and models of user acceptance and combining the factors that are similar to create more comprehensive factors. It was comprised of three determinants of intentions to use a technology (performance expectancy, effort expectancy, and social influence), two direct determinants of usage (intentions and facilitating conditions), and four moderators (age, gender, experience, and voluntariness). UTAUT2 extends UTAUT by incorporating hedonic motivation, price value, habit, and removing voluntariness to fit this context. Two

limitations of UTAUT2 are that it focused on mobile data and that the participant pool with a mean age of 31, which is not representative of an older adult population.

The Senior Technology Acceptance Model (STAM; Chen & Chan, 2014) is an extension of previous technology acceptance theories and models with a focus on older adults' acceptance of technologies in all domains (i.e., computer, digital camera, and sports equipment). This model added age-related health and ability factors (e.g., self-reported health conditions, functional abilities, cognitive abilities, and attitudes to aging and life satisfaction) of older adults. Compared to previous models, STAM found that the direct effects of attitudinal factors (e.g., perceived usefulness and perceived ease of use) were not significant in predicting usage of gerontechnology, but personal characteristics (e.g., age, education, gerontechnology self-efficacy, gerontechnology anxiety, and health deficiencies) and environmental facilitating supports (accessibility, assistance, and guidance) had more of a predicted value. This finding that usefulness and ease of use were not predictive could be due to focusing on usage behavior and not acceptance. Although STAM looked at the older adult population, its focus was on technology in various categories and not specifically HCTs. The authors also noted that the results might not be representative of different cultures because the study was conducted in Hong Kong.

These two models of technology acceptance provide valuable insights, but they are general models that may not capture the unique considerations of older adults and HCTs. Two other limitations from these models are the lack of qualitative methods and not focusing on intentions to use the technology. First, both models were developed using quantitative methods leaving a gap in what the target group's thoughts were regarding the various factors in those models. By using qualitative methods, factors from the literature can be examined and there is a possibility

that other factors that have not been reported in the literature might emerge as well. The second limitation is that these models do not focus on intentions, but more so on the acceptability and the usage of the technology. By focusing on what factors lead to intentions to use the technology, researchers can later predict what factors lead to acceptance and actual usage of a technology (Venkatesh et al., 2003). To address these limitations, we propose an extension of UTAUT2 and STAM in the context of HCTs and older adults.

From these two models, the following factors have been commonly reported as factors that influence intentions to use technology; perceived usefulness, perceived ease of use, social influence, facilitating conditions, and user/contextual characteristics. Specific and unique to HCTs, is advice acceptance, a possible new component of social influence that is somewhat separate from the technology acceptance literature.

## **2.2 Perceived Usefulness**

Perceived Usefulness (PU) is defined as, “the degree to which a person believes that using the particular technology would improve his/her quality of life” (Venkatesh et al. 2003, p. 447). This factor has been shown to be a strong predictor of intentions (Chen & Chan, 2014; Phang, Li, Sutanto, & Kankanhalli, 2005; Szajna, 1995) and adoption/usage of technology (Czaja, Beach, Charness, & Schulz, 2013; Szajna, 1995; Karahanna & Straub, 1999). It has also been reported to be a strong determinant of user acceptance and adoption/usage over a short term & user intentions and usage behavior over a long time (Venkatesh, Morris, & Smith, 2000). UTAUT compiled relative advantage, extrinsic motivation, job fit, and outcome expectations from other models and theories to define PU. Two factors that I hypothesize that could help define PU based on previous research are perceived need (also known as perceived vulnerability) and perceived benefit.

Perceived need can be defined as feeling as if you personally need technological assistance. In other words, the individual believes or does not believe that they currently “need” the technology. Previous research has reported that older adults commonly will not accept a technology that they do not believe they need as a theme (Czaja, Beach, Charness, & Schulz, 2013; Lorenzen-Huber, Boutain, Camp, Shankar, & Connelly, 2011). Older adults will state that they know someone that can benefit from the technology, but they personally will not benefit from it because they do not need it. If the technology does not address their current needs, they are less likely to accept the technology leading to adoption (Thielke et al., 2012).

The older adult must also know the concrete benefits of using the technology creating the factor perceived benefit (Jimison et al., 2008). If older adults perceive the benefits to be high, reducing the technology concerns, this can increase the chance of accepting a specific technology (Peek et al., 2014). Mitzner and colleagues (2010) suggest that informing the older adults of the benefits of the technology will increase the chance of adoption of technology (Lee & Coughlin, 2014; Mahmood, Yamamoto, Lee, & Steggell., 2008).

### **2.3 Perceived Ease of Use**

Perceived Ease of Use (PEOU) is defined as “the degree of ease associated with the use of the system” (Venkatesh et al., 2003, p.450). Venkatesh and colleagues (2003) compiled perceived ease of use, ease of use, and complexity to create this more comprehensive factor. What remains to be undefined in the process that leads to PEOU is the complexity of the technology. A factor that I hypothesize is trust, safety, trust, and privacy all of which are related to familiarity.

Perceptions of safety, trust, and privacy of the technology can influence how complex they perceive the technology to be. Lack of trust of the system, specifically in the information that was provided was a barrier to accepting a technology (Jimison et al., 2008). Privacy is also considered a barrier to accepting technology (Lorenzen-Huber et al., 2011). Older adults mainly opposed to detailed information captured by monitoring systems, also known as granular data collection. Data transparency and the recipients of the data were also a concern of older adults. Knowing what data will be collected, stored, transmitted, or shared and with whom (Lorenzen-Huber et al., 2011). Without the ability to control the device, especially depending on the activity, there is a decreased chance that the older adult will accept the technology. For example, if the healthcare device is monitoring, the older adult should have the ability to turn it off when there is a visitor (Charness & Boot, 2009). Without understanding if they can trust the technology with their privacy or that it is safe can deter older adults from accepting the technology.

The more familiar the technology is perceived to be, the easier it will be to use. Familiarity of the technology, past experiences with related products, can influence one's intentions to use a technology (Mahmood et al., 2008). If there is a lack of experience with the technology (Jimison et al., 2008), this can create a barrier leading to not intending to accept the technology. "The main finding that appeared to drive increased use of the systems was to introduce the new technology gradually. By starting with familiar tools and having a gradual introduction of technology, you can ensure successful use by older participants." (Jimison et al., 2008; p. 39). It has also been reported that the information that one gathers from experience over a period of time has the potential for changing future intentions (Ajzen, 1987). Lee and Coughlin (2015) conducted a review of 59 articles and found that familiarity is an important factor to consider for



older adults due to age being negatively correlated with exposure to technology and technology anxiety is inversely correlated with experience. The familiarity of the technology will make an impact on how the individual perceives the safety, trust, and privacy of the technology. Although UTAUT2 and STAM place familiarity, called “experience,” as part of personal characteristics (Chen & Chan, 2014; Venkatesh, Thong, & Xu, 2012), other research is stating that familiarity influences PEOU.

## **2.4 Social Influence**

Social Influence is “the degree to which an individual perceives that important others believe he or she should use the new system” (p. 451, Venkatesh et al., 2003). UTAUT initially combined subjective norm, social factors, and image to create a more comprehensive factor of social influence. Focusing on the perception of the relationship that an individual has or the perception of themselves.

## **2.5 Facilitating Conditions**

Facilitating Conditions (FC) in STAM is defined by Chen and Chan (2014; p. 639) as “conditions associated with the perception of objective factors in the environment that support usage of gerontology.” Other factors that were said to have a link to FC by UTAUT (Venkatesh et al., 2003) were perceived behavioral control, facilitating conditions, and compatibility. STAM (Chen & Chan, 2014) included basic knowledge, available help, financial resources, accessibility, and social influences.

## **2.6 The Inclusion of Older Adults**

It is essential to focus on older adults instead of generalizing them with the population due to the relationship between aging and older adults' needs, capabilities and limitations. Older adults have wide variability in their abilities, and one cannot assume that there is a "typical" older adult to design a model after. Therefore, user and contextual characteristics are seen and used as moderating variables in the technology acceptance literature. For example, age has been reported as negatively associated with PEOU (Chen & Chan, 2014). Other factors that have been stated as moderating factors are sex (Chen & Chan, 2014; Venkatesh, Thong, & Xu, 2012), education (Chen & Chan, 2014), ability (e.g., functional and cognitive) (Charness & Boot, 2008; Chen & Chan, 2014; Jimison et al., 2008), fluid and crystallized intelligence (Czaja et al., 2006), cultural background (Broadbent, Stafford, & MacDonald, 2009; Renaud & Van Biljon, 2008), self-reported health abilities (Chen & Chan, 2014), self-efficacy (Chen & Chan, 2014; Mitzner et al., 2016; Venkatesh & Davis, 1996), and anxiety (Charness & Boot, 2008; Chen & Chan, 2014; Jimison et al., 2008).

## **2.7 Advice Acceptance**

An important component that is related to, but also unique from, social influence is advice acceptance, the individual accepting the advice given to them. HCTs may be unique because they are often recommended by healthcare providers.

Swol and Sniezek (2005) aimed to understand what factors affected the acceptance of an expert's advice. They found that when the judge (participant) information matched the advisor's advice, that the judge themselves had higher confidence. Also, that low-expertise participants had higher trust. Trust was also higher among the dyad when they knew one another. Among

these factors, the advisor's confidence was the only significant predictor of advice acceptance. They also found that there was a higher chance for the judge to accept the advice given from the advisor when the advisor had high confidence in their advice resulting in accuracy of the information. Another study examined patients' satisfaction with information that they received, patients' views about compliance with medical advice, and the relationship between satisfaction and compliance (Kincey, Bradshaw, & Ley, 1975). Participants were most likely to completely follow the doctors' advice (medicine to take, tablets to take, food/diet, smoking, exercise/rest, and other) if they rated the advice as "very easy" to follow. It was also reported that complete compliance was associated with complete satisfaction. By understanding advice acceptance in this context, we will better understand social influence as it influences intentions to use technology.

As is clear from this review, there are many factors associated with acceptance of technology, this specific user group, and in the context of healthcare. There is currently not a technology acceptance model that unifies these factors nor aim to understand what older adults are considering when a new HCT is presented to them.

## **2.8 Facilitators, Barriers, and Transitions**

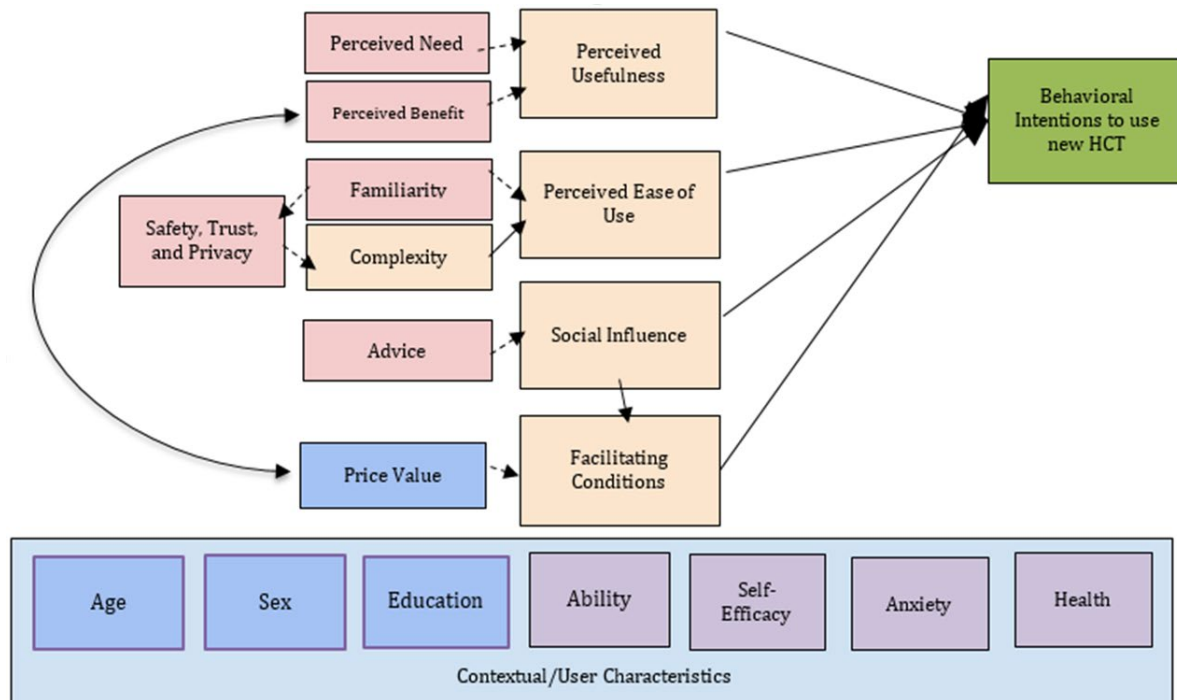
Previously mentioned factors can be divided into three categories to help understand their complexity regarding intentions to use HCTs: facilitators, barriers, and transitions. For example, perceived usefulness may be described as useful, not useful, and not sure/maybe. Facilitators are the positive aspects that can lead to intentions to use a technology. Barriers are the negative aspects that can hinder intentions to use a technology. Lastly, transitions are factors that can transition into a facilitator or barrier depending on what is influencing the individual.

### CHAPTER 3: OVERVIEW OF STUDY

The models and theories of technology acceptance fail to provide in-depth information about what older adults consider when setting their intentions to use HCTs. Although many factors can lead to intentions to use the technology, there is also a lack of information looking specifically at HCTs and older adults. Many of the technologies that been tested for learning about technology acceptance are information technology (Davis 1989; Moore & Benbasat, 1991; Szajna, 1996; Venkatesh, Morris, Davis, & Davis, 2003;), e-government technology (Carter & Bélanger, 2005; Phang et al., 2005), and assistive technology (Peek et al., 2014). Due to the wide variety of technology and the diverse needs of different age groups, it is important to study which factors directly influence older adults when they are choosing to adopt HCTs and how this may change due to the complexity of the technology.

With the factors emerging in the literature regarding older adults, the primary factors reported to influence intentions may be missing key components to their definitions. Example factors that are not included are but are in the literature are perceived need, perceived benefit, and familiarity. Therefore, the purpose of the proposed research is to understand what older adults' initial considerations are when it comes to their intentions to use a new HCT. Also, underlying factors will be investigated to understand if they are directly related to intentions to use the HCT. By understanding how older adults determine the role that the HCT will play in their life can help us later understand the acceptance of the technology. According to STAM (Renaud & Van Biljon, 2008, p. 2), this would be referred to as the objectification stage which is the "process of determining roles product will play." The following research questions will be addressed:

1. What factors emerge when older adults consider using a new HCT?
2. Do the factors differ between HCTs?
3. How well do current models of technology acceptance (e.g., UTAUT2 and STAM) represent the factors that older adults identified in the context of HCT?



*Figure 1.* The proposed Healthcare Technology Acceptance Model (H-TAM) and the relationship among influential factors. Purple represents STAM, blue represents UTAUT2, orange represents revised factors, and red is new. Solid lines represent relationships reported by the literature, and dotted lines represent hypothesized relationships.

The technology acceptance literature and the inclusion of older adults as the target population has resulted in moderating factors that illustrate the differences between individuals and how the influential factors leading to acceptance may change. However, the focus in these studies do not take into consideration older adults with a specific chronic disease but instead

older adults in general. By focusing on older adults with hypertension, one of the top chronic condition that an older adult can have, one can understand the decision processes better regarding what is considered when face to accept a new HCT. Thus, factors were identified as important to this target group and applicable to HCT. A semi-structured interview was then conducted to ask the participants questions related to the factors that were hypothesized to be important in the context of HCT. Lastly, a coding scheme was created to ensure that all factors that older adults may consider were included.

I aim to identify whether older adults' considerations vary as a function of the novelty or complexity of the technology, by understanding how/if factors differ across HCT. During the interview, the participants were introduced to three scenarios and their respective HCT that could support self-managing hypertension. These three HCTs varied on complexity (setup) and functionality (tasks that it can complete). These technologies are the blood pressure monitor, an electronic pillbox, and a multifunctional healthcare robot.

Lastly, I aim to determine if current technology acceptance models (e.g., UTAUT2 and STAM) comprehensively represent the identified factors for intentions to use HCT among older adults, by providing an updated model of factors that influence these intentions. Figure 1 illustrates my proposed model of HCT acceptance among an older adult population. The factors that I hypothesize to lead to intentions to use HCT are perceived usefulness, perceived ease of use, social influence, and facilitating conditions. Perceived need is a factor that helps define PU, like perceived benefit. The familiarity of the technology is a factor that defines PEOU and influences the individual's perceptions of safety, trust, and privacy making the technology more or less complex. In SI, advice acceptance is a factor that has not been considered but implied

through social relationships. Therefore, I believe advice acceptance is a factor that creates SI.

Figure 1 illustrates the relationships among the factors that I will assess.

## CHAPTER 4: METHODOLOGY

The Illinois Institutional Review Board (IRB) approved all research procedures and study measures (IRB #17526).

### 4.1 Participants

For this study, a sample of 24 older adults (65-84) was recruited from central Illinois and the greater Atlanta area. The inclusion criteria for this study were: Fluent in English, live independently, self-reported diagnosis of hypertension (high blood pressure), and have a score of 21 or higher on the Modified Telephone Interview for Cognitive Status (TICS-M; de Jager, Budge, & Clarke, 2003) to assess cognitive function. A score below 21/39 on TICS-M is equivalent to a score below 25 on the Mini Mental Status Exam (MMSE), which suggests mild dementia (p. 322; Jager et al., 2003). A total of nineteen older adults were recruited from the Illinois Health and Engagement Lifespan Project (I-HELP) participant registry for in-person interviews and five older adults were recruited from the Rehabilitation Engineering Research Center on Technologies to Support Aging-in-Place for people with long-term disabilities (RERC TechSAge) participant registry for telephone interviews. Prospective participants on both registries consist of people that expressed interest in being contacted to participate in research studies. One participant was removed due to lack of a complete audio file. Table 2 provides more information on the demographics of the 23 participants.



Table 2.

*Participants' Demographics and Health Descriptive Information*

<b>Factor</b>	<b>Measure</b>	<b>Participants</b>
Gender	Female	70% (16)
	Male	30.4% (7)
Ethnicity	Black/African American	4% (1)
	White/Caucasian	96% (22)
Education	Less than high school graduate	4% (1)
	High school graduate/GED	22% (5)
	Some or in-progress college/Associates degree	13% (3)
	Bachelor's degree (BA/BS)	22% (5)
	Master's degree	26% (6)
	Doctoral degree	13% (3)
Yearly Household Income	Less than \$25,000	26% (6)
	\$25,000-\$49,999	30% (7)
	\$50,000-\$74,999	17% (4)
	\$75,000 or more	17% (4)
	Do not wish to answer	9% (2)
General Health <sup>a</sup>	<i>"In general, would you say your health is..."</i>	M= 3.44 SD= 0.75
Health Compared to Others <sup>a</sup>	<i>"Compared to other people your own age, would you say your health is..."</i>	M= 3.61 SD=0.72

a. 1=Poor, 2=Fair, 3=Good, 4= Very Good, 5= Excellent

In total, 23 older adults, aged 65+ (M=75, SD=4.18, age range 67-84) were interviewed. Majority of this sample identified as female (n=16) and White/Caucasian (n=22). Education and yearly household income among this sample varied greatly. In general, participants rated their subjective health as good for themselves and compared to others their age.

## 4.2 Measures

**Demographics and health questionnaire.** The Demographics and Health Questionnaire (Czaja et al., 2006) was administered to collect information about the participants' general demographic information (e.g., age, sex, ethnicity, living arrangement), occupational status, and general subjective health.

**Multi-dimensional health locus of control form c.** Participants completed the Multi-Dimensional Health Locus of Control Form C (MHLC-C), an 18-item self-administered questionnaire, to assess health/medical condition beliefs about their control over their own illness or disease (Wallston, Stein, & Smith, 1994). Form C is divided into four dimensions: Internal, Chance, Doctors, and Other People. *Internal* measures the belief that one's health condition is due to their own behavior (6 items), *Chance* measures the belief that the health condition is a matter of fate or luck (6 items), *Doctors* measure the amount of control that the individual believes that their doctor has over their health condition (3 items), and *Other People* measures the amount of control that the individual believes that "powerful others" (e.g., family and friends) contribute to their health condition (3 items). Participants were asked to circle a number that represents their extent of belief of that item on a six-point Likert scale, where 1=strongly disagree, and 6=strongly agree.

**Technology experience profile.** The Technology Experience Profile is a descriptive measure that was developed by Barg-Walkow, Mitzner, and Rogers (2014) to assess familiarity and experience with six different technologies in each of six different domains that are representative of everyday technology interactions (36 items). The domains are communication technology, computer technology, everyday technology, health technology, recreational

technology, and transportation technology. Participants were asked to indicate how much they used the technologies on a five-point Likert scale, where 1=Not sure what it is and 5=Used frequently, within the last 12 months.

**Technology readiness index 2.0.** The Technology Readiness Index 2.0 (TRI 2.0; Parasuraman & Colby, 2014) is a questionnaire that measures one's readiness to embrace new technology. There are two versions of this questionnaire, a 16 item, and a 10 item, and we used the 10-item questionnaire due to technology readiness not being the focus of this project. The 10-item measurement gives an overall score of one's technology readiness. Those beliefs that the 10-items are broken into are optimism, innovativeness, discomfort, and insecurity. TRI 2.0 is scored on a five-point Likert scale where 1=Strongly Disagree and 5=Strongly Agree.

**Healthcare technology acceptance interview.** A semi-structured interview was developed specifically for this study to assess participants' opinions and beliefs regarding factors related to acceptance of HCTs. The beginning of the interview informed the participants of the goals of the interview and the importance of answering with their honest opinion with no answer being wrong. Once the interview began, participants were asked to state what the last HCT that they used and what for to understand their relationship with HCT.

The interviewer then read a scenario for the participant to imagine followed by introducing one of three HCTs separately that was recommended by their healthcare provider: a blood pressure monitor, electronic pillbox, and a multifunctional robot. Each scenario and the description of the HCT that was presented was developed by the researcher to include different aspects of self-managing hypertension based on the novelty and/or complexity (set up) of the technology. The blood pressure monitor was chosen due to the technology being a common

method of monitoring one's blood pressure and will allow the user to monitor their blood pressure anywhere. Next, older adults can take up to five or more prescription drugs to help manage their health (Aitken & Valkova, 2013; Gu, Dillion, & Burt, 2010), resulting in keeping track of taking hypertension medication. Due to this, the electronic pillbox was chosen to illustrate keeping track of taking multiple medications at a time and reminding the user to take their medication at a pre-set time. Lastly, hypertension can also lead to having a stroke (CDC, 2019). Therefore, the multifunctional healthcare robot was chosen to illustrate complexity by having the ability to complete two tasks (monitoring blood pressure and managing medications) but also to help one self-manage their health after having a stroke. Each description was based on a technology that was currently on the market. Each technology had the same number of steps for set-up. However, the steps took longer to complete as the technology became more complex (See Appendix H).

Following this scenario, the participant was given a written description of the HCT to follow as the interviewer read the description aloud. This description explained what the technology was and gave steps on how to set it up. For telephone interviews, participants received a packet via the mail or e-mail that included the three descriptions. To control for order effects, the technology was counterbalanced between participants. Once the interviewer finished reading the description, the participants were given time to read over the description by themselves.

When the participant finished, they were asked questions related to their current experiences to assess their intentions to accept a new HCT and to learn of any emerging factors that may be important to this population and HCT acceptance. The same questions were asked for each of the three HCTs (Table 3). At the end of the interview, participants were asked which one of the three technologies they would choose if they only had to choose one and why to

understand their future intentions of accepting a technology over two others that can help their health condition. Furthermore, the interviewer used general probes when necessary to elicit more information from the participants' responses (e.g., "What makes you feel this way?").

Table 3

*Influential Factors used with their Definitions and Interview Questions*

Factors	Definitions	Related Interview Questions
Perceived Usefulness	"the degree to which a person believes that using the particular technology would improve his/her quality of life" (Venkatesh et al. 2003, p. 447).	Do you think this technology useful? a. If yes, "Why?" b. If no, "Why not?"
Relative Advantage	"degree to which a technological factor is perceived as providing greater benefit for firms" (Rogers, E.M.; 1983)	Do you currently use something similar to this technology? Is this a technology that you would currently use in place of your current method? 1. Do you see this new technology easier to use than (fill in the method or device that they are currently using)?
Perceived Need	Perceived need can be defined as feeling as if you personally need technological assistance. Lorenzen-Huber et al., 2011; Czaja, Beach, Charness, & Schulz, 2013	Do you need this technology to assist you in (fill in the task of the technology)? Do you think this could be helpful for other people?
Perceived Benefit	The concrete benefits of using the technology (Jimison et al., 2008; Peek et al., 2014; Mitzner and colleagues (2010); Lee & Coughlin, 2014; Mahmood et al., 2008).	What are some of the benefits that would come from using this technology? a. After talking about the benefits of using this technology, do you believe this new technology would improve your health at all? b. Do you see any challenges with how this technology would help with your health?

Table 3 (Cont.)

Perceived Ease of Use	“the degree of ease associated with the use of the system” (Venkatesh et al., 2003, p. 450).	How easy do you believe it would be to use this technology? Do you see this new technology easier to use than (fill in the method or device that they are currently using)?
Convenience/Inconvenience	"Makes life easier or harder in some way." (Mitzner et al., 2010; p. 1713)	Do you believe you would have to put forth any effort to use this technology? (e.g., time)
Trust	"Willingness of a party to be vulnerable to the actions of another party based on the expectation that the other will perform a particular action important to the trustor, irrespective of the ability to monitor or control that other party" (Mayer, Davis, & Schoorman, 1995, p. 712).	Would you trust this technology?
Privacy	Privacy is made up of perceived usefulness, social relationships, data granularity, and sensitivity of activity (Lorenzen-Huber et al., 2011).	Do you believe this technology will get in the way of your privacy?
Advice Acceptance - Healthcare Provider	The ability to accept advice or a recommendation from a healthcare provider.	This technology is recommended by your healthcare provider, does this make you more likely to use it?
Familiarity	Past experiences with related products.	How familiar are you with this type of technology? Do you currently use something similar to this technology? (i.e., method or device) a. If yes: Can you describe it? i. Is this a technology that you would currently use in place of your current method or device?

Table 3 (Cont.)

Subjective Norm - Healthcare Provider	The person's perception that their healthcare provider believes that they should or should not use a healthcare technology.	How would your healthcare provider feel about you using this technology?
Subjective Norm - Family	The person's perception that their important family members believe that they should or should not use a healthcare technology.	How would your family feel about you using this technology?
Subjective Norm - Friends	The person's perception that their important friends believe that they should or should not use a healthcare technology.	How would your friends feel about you using this technology?
Advice Acceptance - Family	The ability to accept advice or a recommendation from a family member.	If a family member recommended you to use this technology, would this make you more likely to use it?
Advice Acceptance - Friends	The ability to accept advice or a recommendation from a friend.	If a friend recommended you to use this technology, would this make you more likely to use it?
Facilitating Conditions	The degree to which an individual believes that an organizational and technical infrastructure exists to support the use of a healthcare technology. (Venkatesh et al., 2003)	Some people may or may not need help using this technology. Would you be comfortable using this new technology on your own? a. If yes: Why would you be comfortable using this technology on your own? b. If no: What would make you comfortable to use this technology on your own?

Table 3 (Cont.)

<p>Perceived Cost</p>	<p>“consumers’ cognitive tradeoff between the perceived benefits of the applications and the monetary cost for using them” (Venkatesh, Thong, &amp; Xu, 2012; p. 161).</p>	<p>After reading the description, how much do you believe this new technology will cost?                  20. You said that you believe this technology cost (insert amount stated). If you had to pay that amount out of pocket to buy this new technology, would you use it?                  a. If yes: Why would you buy this technology?                  b. How about if your health insurance covered half of the cost, do you believe you would use this technology?                  c. How about if we offered it to you to take home for free, would you use this technology?</p>
<p>Compatibility</p>	<p>The degree to which an innovation is perceived as being consistent with existing values, needs, and experiences of potential adopters.</p>	<p>Do you believe you can easily incorporate this technology into your daily routine?</p>



### 4.3 Procedure

Potential participants from the I-HELP participant registry and RERC TechSAge participant registry were contacted over the phone to inquire interest in participating in this study. If the older adult was interested in being in this study, they were pre-screened to see if they qualified based on the inclusion criteria (i.e., fluent in English, self-reported diagnosis of hypertension, live independently, and a score of  $\geq 21$  on the TICS-M). If they did qualify, details about the study (e.g., length and compensation) were given. Once the participants met the requirements of the study and they were still interested, an interview session was scheduled. If they did not qualify, they were asked if they would like to stay in the registry to be contacted as a possible participant in other research studies.

The session was 1.5 hours in length and included three parts of the study. In-person participants were given the written informed consent form after they arrived for the research study. After the participant read and signed the consent form, the interviewer asked 1) if the participant has questions or concerns, 2) if everything is clear to the participant, and 3) whether the participant would like to continue. If the interviewer determined that the participant was sufficiently informed, comprehends, and is willing to continue, then part one of the study began.

If the participants were remote, participants received an email containing the links to Qualtrics, an online survey company, for the informed consent form and the four questionnaires. Once all four questionnaires were completed, the participant was contacted to schedule the date and time of the interview session. During the day of the interview, the informed consent form was reviewed again so that the interviewer could answer any questions that the participant had. If

the participant consented in completing the interview, the interviewer signed the Waiver of Documentation for Informed Consent form.

Once consent was received, in-person participants completed part 1 of the study which was the TEP and the TRI 2.0. When part 1 was completed, the interviewer started the audio recorder and participants began the Healthcare Technology Acceptance Interview. Participants' verbal responses were audio recorded to be transcribed and analyzed later. When the interview was completed, the audio recorder was turned off, and the in-person participants took a 5-minute break before going to part three of the study. Once the participant returned, or the participant decided not to want to take a break, they were asked to complete the Demographics and Health questionnaire and the MHLC-C. Participants were encouraged to ask questions and take breaks when needed during the interview. Once all parts were completed, the participant was debriefed and compensated with a \$25 Amazon Gift Card for their participation.

## CHAPTER 5: ANALYSIS

### 5.1 Quantitative

The data collected from the questionnaires were analyzed using descriptive statistics (e.g., frequencies, ranges, means, and standard deviation) in Excel to describe the characteristics of the participants.

### 5.2 Qualitative

Audio files recorded during the interviews were transcribed using Scribie, a professional transcription service they were then checked for accuracy by a researcher. The primary coder segmented these transcripts within MAXQDA, a software program designed for qualitative and mixed methods data, and then the coding scheme was applied by the primary and the two secondary coders. Each of the coders on this study have a background in applied health with a focus on supporting older adults with the help of technology. Transcripts were segmented into units of analysis by the primary coder. A segment was defined as a complete response to a question. This ensured that context and completeness in the participant's response were maintained.

The focus of the coding was to identify the factors related to older adults' intentions to use or not use a new HCT. The coding scheme was developed using an integrated approach to include factors that participants consider when thinking about the acceptance of HCTs (Mitzner, Bixter, & Rogers, 2016). First, a top-down approach was utilized to include factors and their definitions from the literature and into the coding scheme. Second, a bottom-up approach was utilized to include factors that emerged during the coding process. The coding scheme was applied to report the frequencies of the codes and to help identify the overall important themes. To determine the frequency, each segment was coded with a subcode using the following rules:

- If there is a segment that relates to the definition of a specific subcode, one instance was added to the sum of that subcode.
- If the segment related to definitions among *different* subcodes, an instance was added to each subcode.
- If the segment related to one subcode and it was stated *multiple times* throughout the segment, only one instance was added to the sum of that subcode.
- If the segment does not relate to any definition in the coding scheme, the “Other” subcode was used.
- If the segment is too general where no definition can be used and it was related to the overarching code, the “General” subcode was used.

To minimize researcher bias, there was one primary coder and two secondary coders. To ensure the reliability of coding, Cohen’s Kappa was calculated in MAXQDA to make sure that the coders agree with each other. Cohen’s Kappa was chosen to understand the percentage of agreement among coders after the possibility of chance was removed (Brennan & Prediger, 1981). Interrater reliability of 80% was the minimal threshold of agreement between the primary coder and the two secondary coders. Banerjee and colleagues (1999) reported that an agreement above 75% represents excellent agreement beyond chance.

The three coders conducted rounds of independent coding on the same two randomly selected transcripts until interrater reliability of 80% or higher between the primary coder and the two secondary coders were reached. First-round resulted in an inter-rater reliability of 67% and 70% between the two secondary coders and the primary coders. Second round resulted in an inter-rater reliability of 86% and 87% between the two secondary coders and the primary coder. During this iterative process, coders discussed any discrepancies and adapted the coding scheme

as needed. Once interrater reliability was reached, the transcripts were randomly divided between the three coders and coded independently. The primary coder coded fourteen of the transcripts and the two secondary coders each coded seven different transcripts (n=23). The complete coding scheme is provided in Appendix D.

## CHAPTER 6: RESULTS

### 6.1 Characteristics of Participants

Within the past year, technologies were used once, if not occasionally, among this population. Health technology, such as a blood pressure monitor, was used at least once. However, communication technology (e.g., mobile phone), computer technology (e.g., desktop/laptop computer), everyday technology (automatic teller machine), and recreational technology (e.g., digital photography) was used once if not occasionally compared to health and transportation technology (See table 4).

Table 4.

#### *Technology Experience Profile*

<b>Technology Experience</b>	<b>Participants</b>
Communication Technology (e.g., Answering Machine/voicemail, Fax, Mobile Phone)	M = 1.95 SD = 1.23
Computer Technology (e.g., Desktop/Laptop Computer, Tablet Computer, Email)	M = 1.75 SD = 1.29
Everyday Technology (e.g., Automatic Teller Machine, Photocopier, In-Store Kiosk)	M = 1.83 SD = 1.29
Health Technology (e.g., Blood Pressure Monitor, Digital Thermometer, Heart Rate Monitor)	M = 0.85 SD = 1.13
Recreational Technology (e.g., Digital Photography, Electronic Book Reader, Online Shopping/Coupons)	M = 1.49 SD = 1.26
Transportation Technology (e.g., Airline Kiosk, Bus Tracker, Online Travel Reservation)	M = 1.21 SD = 1.24
Overall Technology	M = 1.51 SD = 1.24
0=Never Used, 1=Used Once, 2=Occasionally Used, 3=Frequently Used	

When focusing on their health condition, participants had a strong belief that their health is due to their own behavior. If it was not for their own behavior, there was a moderate belief that it was due to chance or the doctors. Lastly, there was a low belief that their health condition was caused, or controlled, by powerful others (e.g., family and friends).

Table 5.

*Multidimensional Health Locus of Control Form C*

<b>Factors</b>	<b>Participants</b>
Internal	M=24.04 SD=5.17
Chance	M=20.39 SD=6.49
Doctors	M=15.65 SD=2.10
Other People	M=8.52 SD=2.83
6 to 14 = Low Inclination, 15 to 22 = Moderate Inclination, 23 to 30 = Strong Inclination	

Although the mean score for optimism (the general belief that the technology has positive benefits) surrounding technology readiness among the participants was the highest among the participants, discomfort (perceived lack of control) and insecurity (the belief that the technology can result in adverse impacts) followed resulting in scores just above the average. Innovativeness (wanting to experiment, learn, and talk about the technology) however reached an average score among the participants.

Table 6.

*Technology Readiness Index 2.0*

<b>Dimensions</b>	<b>Participants</b>
Optimism	M=3.88 SD=1.21
Innovativeness	M=2.92 SD=1.18
Discomfort	M=3.12 SD=1.26
Insecurity	M=3.44 SD=1.17
1=strongly disagree, 5=strongly agree	

## **6.2 Factors Mentioned Related to Intentions to use HCTs**

In the context of using HCTs, one of the goals of this study was to understand what factors emerged as older adults considered using a new HCT. Factors were divided into facilitators, barriers, and transitions to help with the explanation of these findings. The goal of identifying barriers and transitions regarding intentions to accept HCTs is to have the opportunity to research ways to change them into facilitators (Mitzner, Sanford, & Rogers, 2018). First, findings regarding facilitators will be reviewed for the three different HCTs combined. All factors were counted based on frequency mentioned.



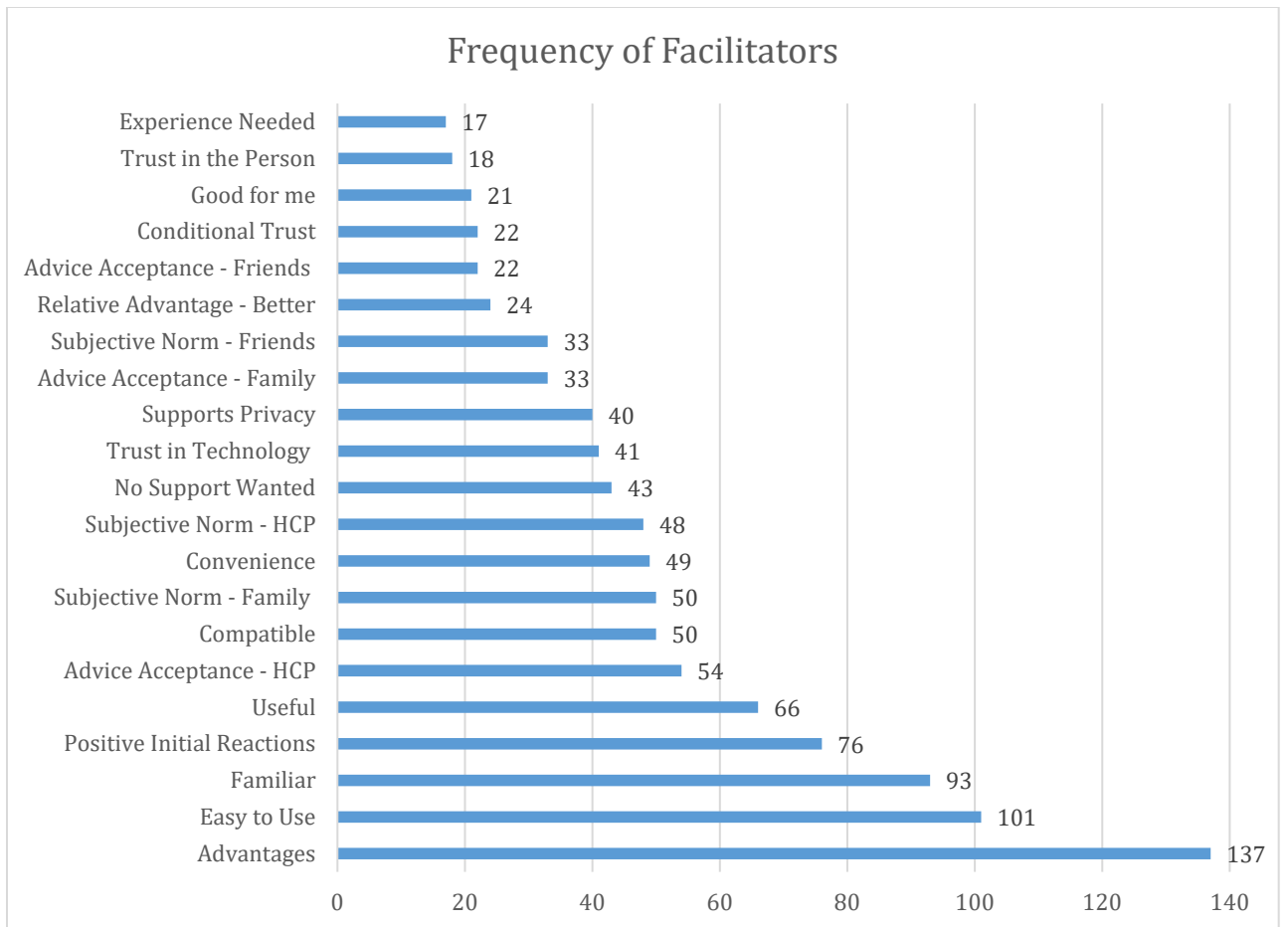


Figure 2. The frequency of facilitators mentioned regarding accepting HCTs.

As Figure 2 illustrates, older adults identified 21 facilitators related to positive intentions to HCT acceptance. The factor with the highest amount of counts across the three technologies was “Advantages.” Advantages is the positive component of “Perceived Benefit” which focuses on the older adult understanding the concrete benefits of using the technology. Similarly, participants rated the optimism dimension on average as higher in the TRI 2.0. Illustrating that positive benefits are thought of when technology is presented. An example quote is *“Well the main reason is I sometimes you know lose track of time and if it’s a medication that has to be taken at a certain time. You know there’s times strictures [restrictions] on it then you know like I*

said you're out of luck if you miss that time by too much you can't take it 'til the following day so that is a good feature there. Beep beep take your meds." The least important of the facilitators was "Trust in Person," which illustrates the older adult trusting someone that may be recommending the use of the technology. An example quote is "Like I say, I trust my doctor quite a bit...." Of the top five most mentioned facilitators, four related specifically to perceived usefulness (2) and perceived ease of use (2).

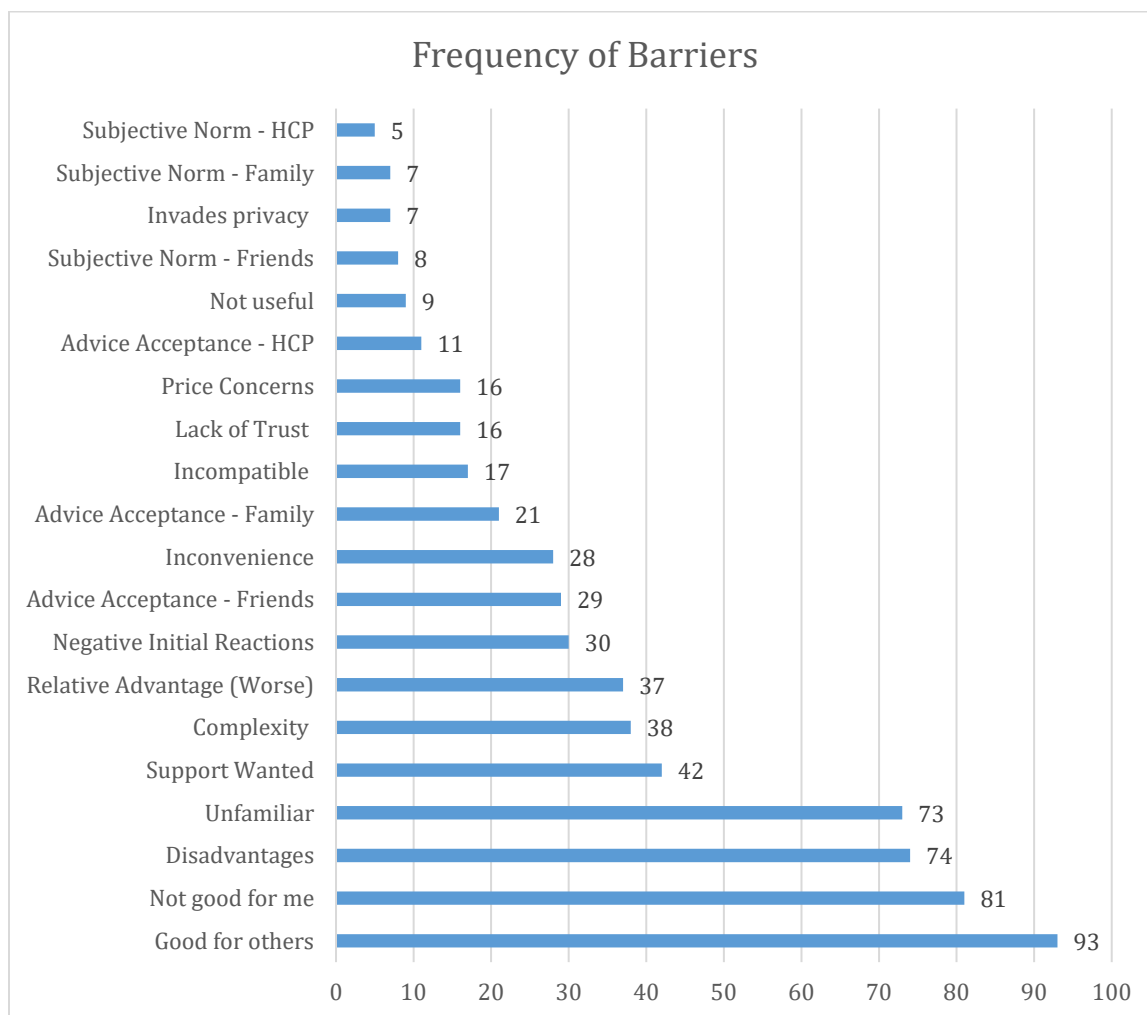


Figure 3. The frequency of barriers mentioned regarding accepting HCTs.

Regarding barriers to acceptance HCTs, the most frequently mentioned of the 20 are “Good for others” and “Not good for me.” These two were mentioned in a similar context with each other where the older adult perceived the technology to be useful for someone else, but not them at that moment. Example quote is *“My initial reaction is that it's not needed for me, but it could be helpful to say somebody that had in stroke or had dementia issues worse than mine.”* The least mentioned barrier was the subjective norm for the healthcare provider. The older adults perceived that their healthcare provider would not have any feelings towards them using the HCT. An example quote is *“Probably would have some of the same concerns I expressed with it”* and *“I don't think they'd want me to.”* The top five most mentioned barriers are related to perceived usefulness (3), perceived ease of use (1), and facilitating conditions (1).

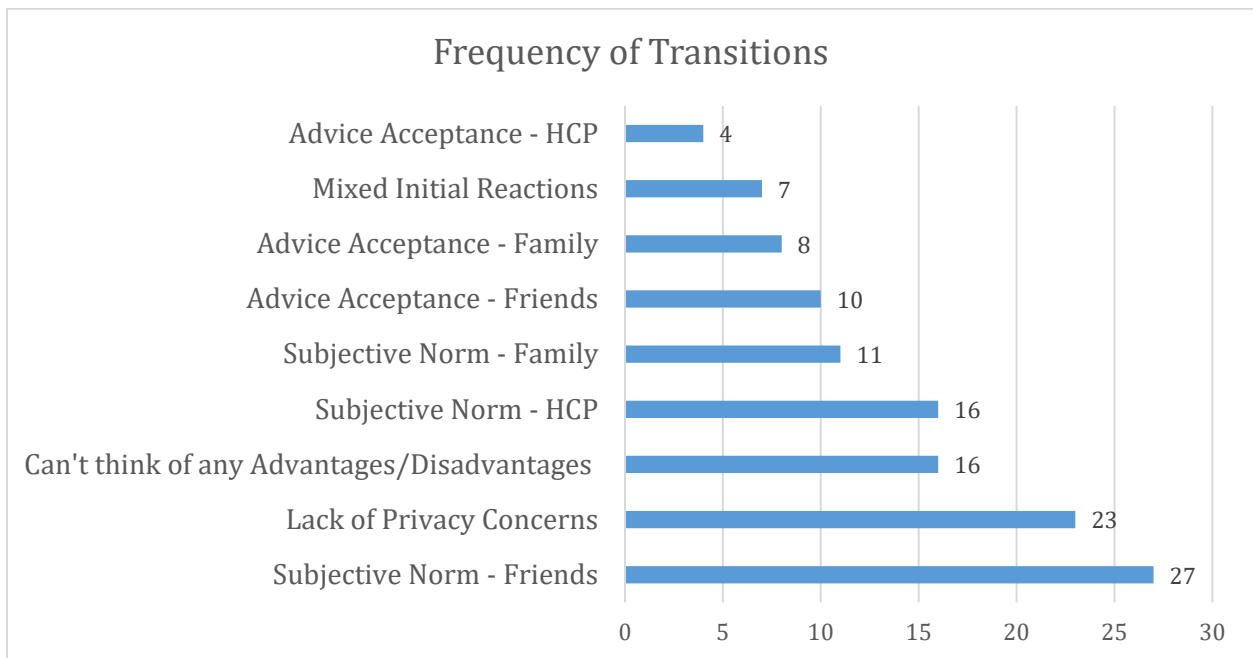


Figure 4. The frequency of transitions mentioned regarding accepting HCTs.

There is also a transition category that did not facilitate nor create a barrier for older adults to accept HCTs. These factors are not considered when evaluating if one should or should not accept a technology due to the lack of or mixed information that they are receiving — for example, not knowing what friends would think about them using a technology due to not having friends. The factor that was most frequently mentioned was subjective norm related to friends and the least frequently mentioned was advice acceptance from a healthcare provider. The subjective norm related to friends focused on the participant not being sure how their friends would feel about them using the technology. An example quote is “*It's not a negative or positive, we just don't seem to talk about this stuff.*” The least mentioned was regarding accepting advice from one’s healthcare provider. The focus was on not being sure if they would use the technology based on the advice given at that time. Two example quotes are “*Recommended? I don't know the answer to that*” and “*Probably. Well I'm I have to admit I'm a little skeptical about all the advice I get I don't take all the advice I get I'm afraid. I've had bad experiences with being mistreated.*”

One new factor that is new in the domain of technology acceptance is advice acceptance from one’s care network. Participants in this study stated that they were more likely to use one of three HCTs when their healthcare provider recommended it compared to family members and friends when focusing on facilitators. However, this inverted when looking at the frequency mentioned as barriers where participants were least likely to use one of the three HCTs when their family or friends recommended the technology. Additionally, participants mentioned being least likely to use one of the three HCTs as the technology became more complex. Advice acceptance from a healthcare provider was mentioned the least among the three groups of HCTs.

### 6.3 Differences Between Technology

The three HCTs presented in this study increased in complexity to understand if there were any differences between technologies. Findings illustrate that there are patterns related to differences for facilitators, barriers, and transitions. Figure 6 depicts the distribution of frequency among the facilitators. Some of these factors had relatively similar frequency counts across HCTs (e.g., subjective norm from friends) whereas some had noticeable differences (e.g., familiar). Of the 21 facilitators, the least complex technology (the blood pressure monitor) was mentioned more frequently (11) followed by the electronic pillbox (7) and the multifunctional healthcare robot (1).

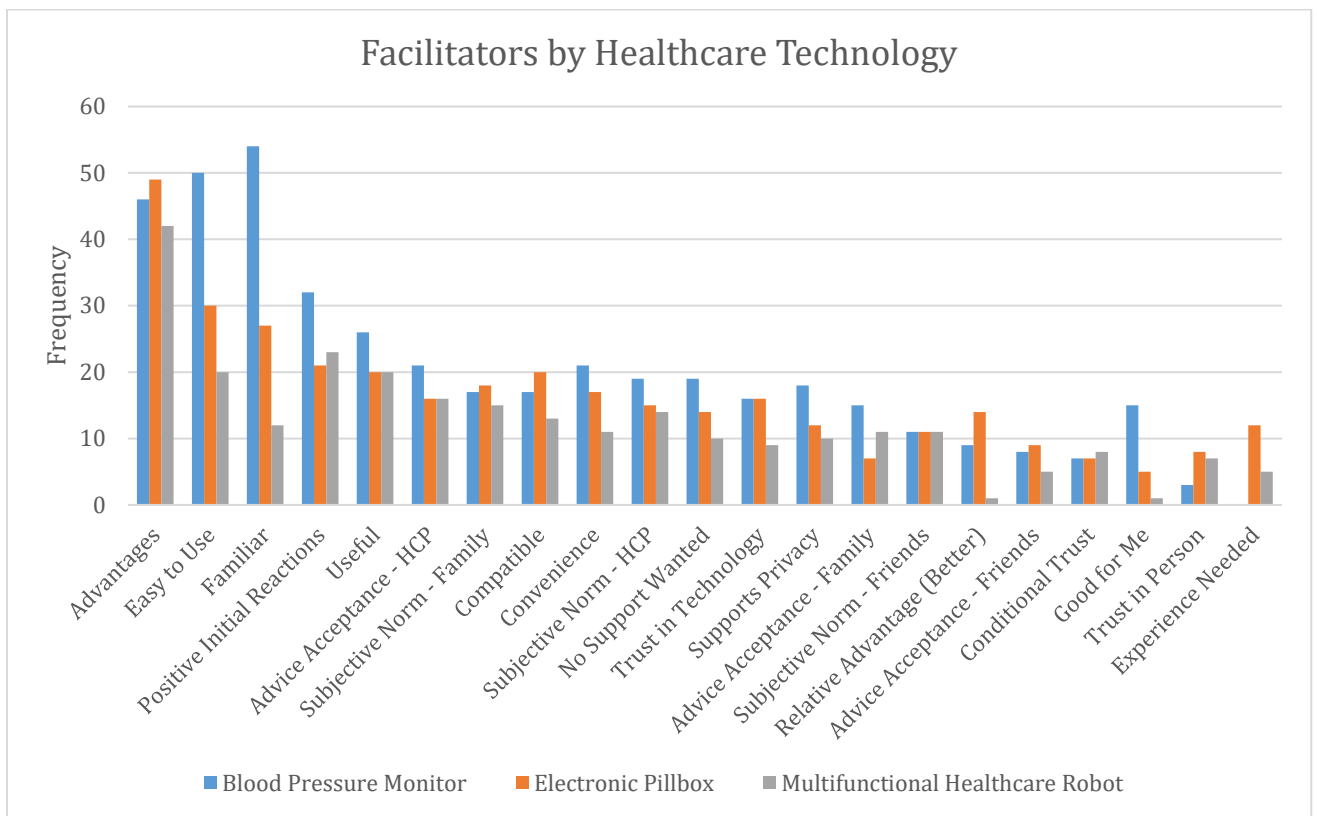


Figure 5. Identified facilitators of intentions to accepting HCTs among the three HCTs used in this study.

Barriers of intentions to accept a new HCT (figure 7) was noticeably different from facilitators due to the multifunctional healthcare robot being mentioned more than the other two HCTs for most of the factors and the blood pressure monitor staying relatively low among all factors. Of the 20 identified barriers, 13 had a higher frequency mentioned for the most complex technology (the multifunctional healthcare robot) followed by the electronic pillbox (4) and the blood pressure monitor (0).

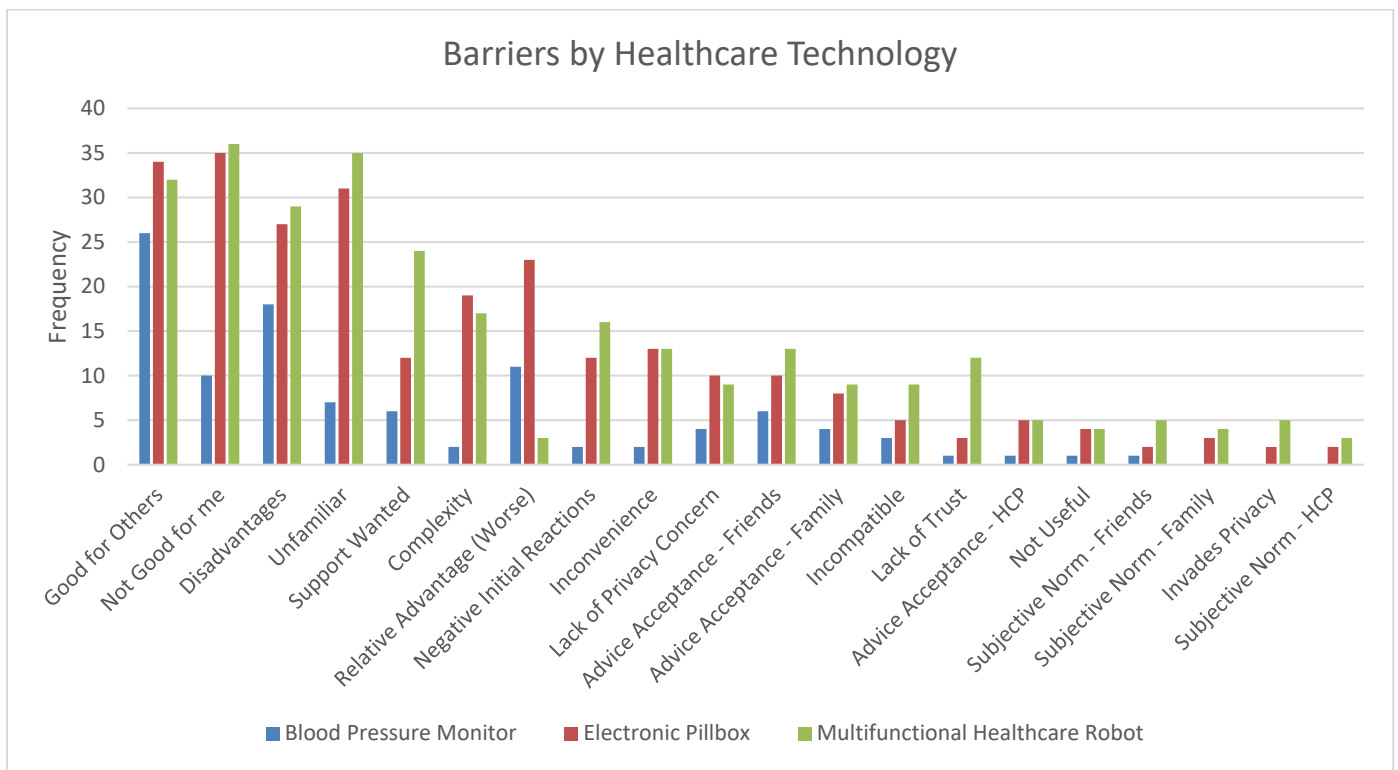
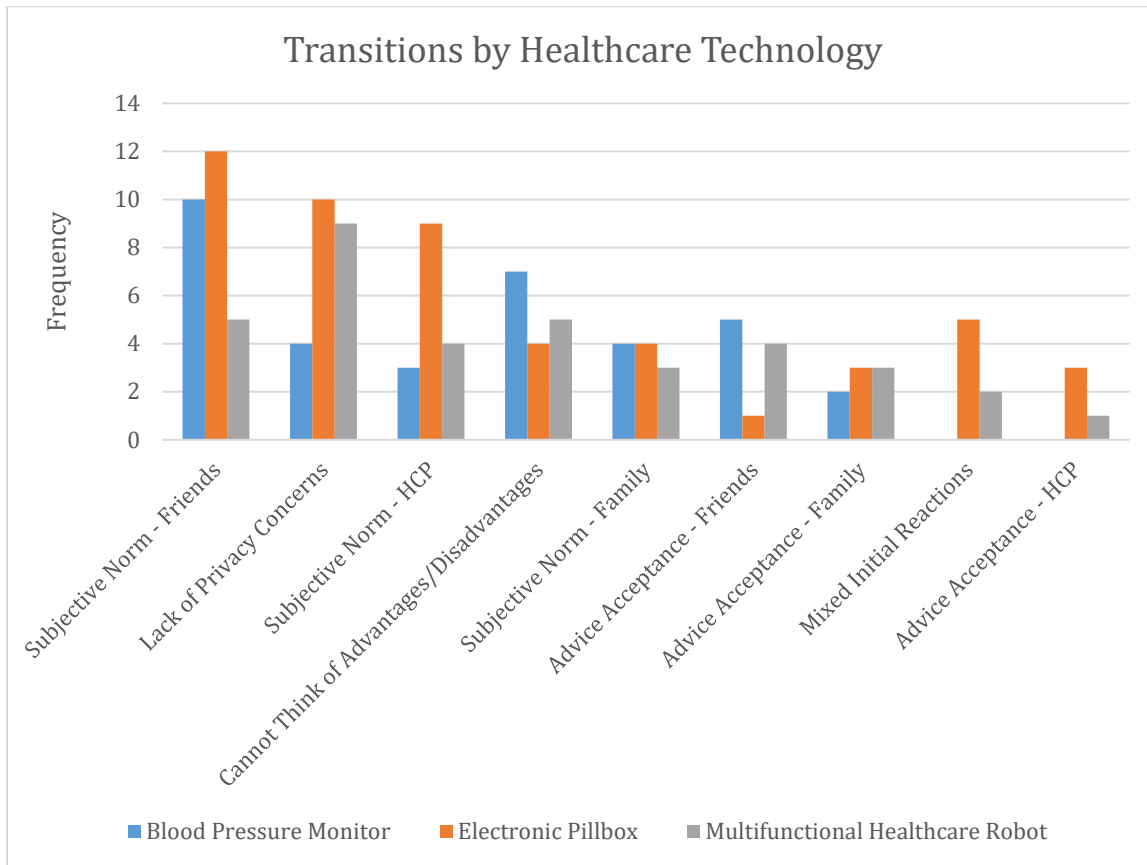


Figure 6. Identified barriers of intentions to accepting HCTs among the three HCTs used in this study.

The transitions to use a new HCT were the most diverse between the three HCTs (Figure 8). Between three HCTs, the electronic pillbox was the most mentioned compared to the blood

pressure monitor and the multifunctional healthcare robot except for the factor “not good for me.” Participants did not mention the blood pressure monitor regarding advice acceptance from their healthcare provider (e.g., not knowing what they would think) nor had mixed initial reactions regarding the blood pressure monitor.



*Figure 7.* Identified transitions of intentions to accepting HCTs among the three HCTs used in this study. Advice acceptance in this context is related to the participant not being sure if they would accept the advice. Subjective norm focused on the participant not being sure how the person would feel, not caring what the person thought, believing that the person would not care, did not discuss their condition, does not see their friends or family often, and does not have friends or family members.

Out of the 28 times, information was requested, 14.29% (n=4) related specifically to the Blood Pressure Monitor (See figure 9). Examples of information that was requested were to understand if there would be support in using this technology and of effort required. Example quotes stated is *“If you have a blood pressure monitor, and you're not sure, but it's a... it's not looking like your readings are correct, is there a place you can take it to find out? It's if there's a problem with it, or not?”* and *“How long does it take you to slap that thing up there?”*

Regarding the Electronic Pillbox, this percentage increased to 35.71% (n=10). Older adults were concerned with the features of the technology. *Example quotes stated is “When you say in the hub, is that where you put the UBS and you plug it into something or? The hub is a large and easy read screen. Okay, this is a screen that needs to scroll. Is this almost like a monitor?”, “...how big is it?”,* moreover, *“Wait, does Google run it?”*

Lastly, 50% (n=14) of the coded segments were related to requested information about the Multifunctional Healthcare Robot. The questions ranged from aiming to understand if it can do any other functions to the ability to move within the home. Example quotes stated is *“Can I program him to clean up home?”* and *“What about stairs in a house this robot could go up and down stairs?”*



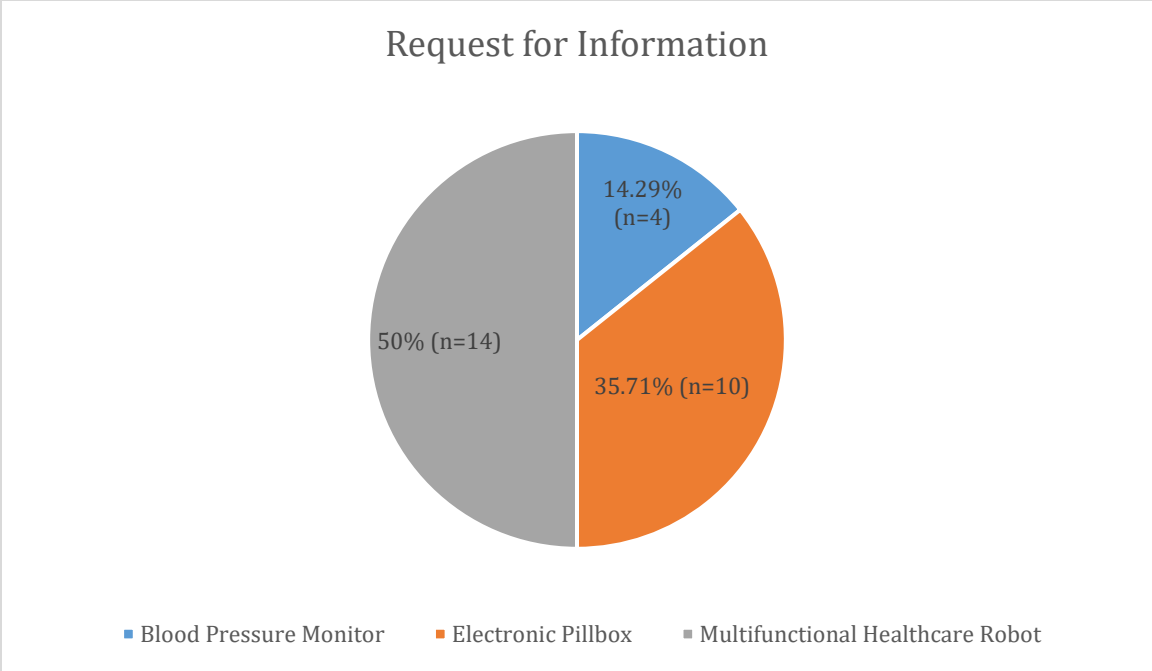


Figure 8. Percentage of information requested between healthcare technologies.

Participants were asked at the end of the interview, “If you can only choose one of these technologies, which one would you choose and why?”. Of the 23, 15 (65%) stated that they would prefer the blood pressure monitor (See Figure 10). Their responses revolved around currently needing it. Example quotes stated is, “*Blood pressure monitor cus I need it right now*” and “*Because blood pressure is my major health concern right now. And because it’s easy to use and the concept of blood pressure makes sense to me.*”

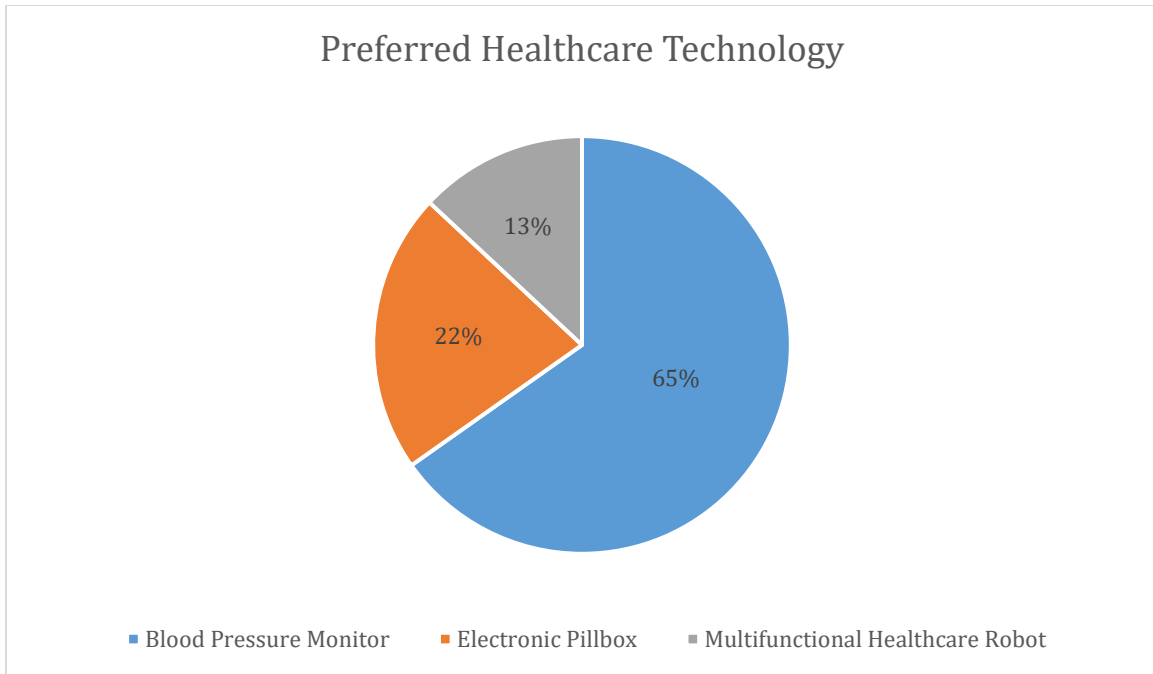


Figure 9. The preferred healthcare technology among the participants.

The electronic pillbox was preferred 5 out of 23 times (22%) with one of the main reasons being the reminder feature to help with remembering to take medications. Example quotes stated is “...because I don’t like forgetting my pills. You know? I hate skipping them and then I wouldn’t have to have my husband all of the time” and “Because like I said, I’ve had a few problems with that myself, and I’m still capable during the blood pressure. I actually have one at home that my mother that was my mother’s. It’s probably too old to be dependable now, but I mean there’s so many places you can do it the grocery store, or you can do it at Walgreens. So, you can get that done any time. But the medicines... That’s definitely just on you. Okay, I... So, I think that would be the thing that I think that might be the most advantage for me.”

The Multifunctional Healthcare Robot was only preferred by 3 out of 23 (13%) times. The reasoning behind choosing the Multifunctional Healthcare Robot over the Blood Pressure Monitor and the Electronic Pillbox is that it was multifunctional and could be used in the future

without hindering any current methods. Example quotes stated is *“Well I guess I would choose the robot. And that would be because this this pillbox complicates my current system and I just really don’t get into blood pressure monitoring. And if I needed this robot because of my physical condition then I think once it and I developed a relationship it probably would be helpful”* and *“Because he has the blood pressure and he also has the medications that he would take care of for me to remind me of doing. It does two things instead of the one thing each. I’d choose him.”*

#### **6.4 Healthcare Technology Acceptance Model**

Within the context of HCT, participants mentioned new factors that have not emerged in technology acceptance models that pertains to older adults. These factors were familiarity, perceived need, perceived benefits, advice acceptance, and trust. Furthermore, many of these factors were considered during the older adults’ initial reactions of the HCTs to inform their decision. See Figure 5 to see the conceptual model of H-TAM and its processes.

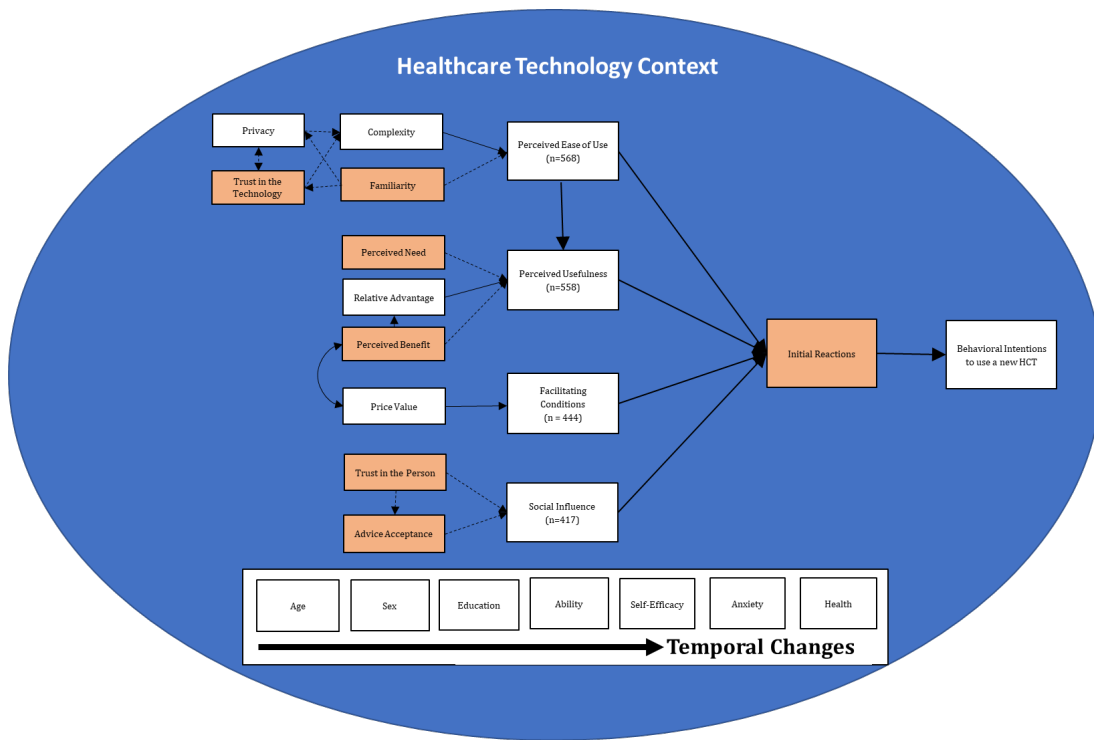


Figure 10. The Healthcare Technology Acceptance Model for older adults is a conceptual model, highlighting the new factors. The blue represents the context that HTAM is in, the context of healthcare technology. The orange represents the new factors. White represents factors that had been identified in previous models of technology acceptance. Solid lines represent relationships reported by the literature, and dotted lines represent hypothesized relationships.

If the technology was familiar to the older adult, it informed their thoughts on trust in technology and privacy. Resulting in later informing their thoughts on how complex the technology is perceived to be. An example quote is *“I use apps and stuff like that. To me, this is like setting an electronic timer, and I have a couple at home, and one of them, the instructions are terrible and I just don't use it anymore, and the other ones are just like that. So, it has to do with how good the app is, I think. Alright.”*

Technology can be perceived as good for others, good for me, and/or not good for me (right now). These factors are also referred to, in this context, as perceived need. Perceived need as

mentioned before, came up more frequently as a barrier (good for others and not good for me). An example quote is, *“I’m sure it could be useful for the right person I’m not sure I’m that right person though.”* When stating that the technology may not be good for them to use, some participants detailed that it may not be good for them right now but that it could be useful in the future. This depicts that the technology could be used by them in the future (temporal changes) as their needs change. An example quote is, *“Right now, I don’t think I have any need for it. I don’t think it would be of any help. I’m thinking of my house, and I’m thinking it’d be in the way, but uh, I think. I can see where it would be a great help to somebody that had memory limitations. Which I have enough of them just with aging but otherwise I don’t really see where it would be that much of a problem.”*

Perceived benefits, knowing the advantages and disadvantages to using the technology, related to relative advantage and perceived cost. If the technology had more advantages or disadvantages than the person’s current method or device, there was a higher chance of them being willing to use or not use the technology. An example quote is, *“No, because if I didn’t go there... I go to the doctor enough and have my blood pressure taken. Every time I see a doctor, they take your blood pressure, and I would only do this if there were a lot of abnormalities, to bring it up as an issue to my GP. So, would I use this now? No, because I don’t have a blood pressure issue.”* Dependent on the cost, participants may or may not be willing to accept the technology regardless of the benefits. An example quote is *“I think it would be a plus. Again, depending on the cost, whether I would invest in that or not. I’ve only forgotten once in six months, so I’m still pretty cognizant, but it would relieve your mind that...”*

Advice acceptance and trust in the person emerged as factors that inform social influence. Depending on the person and the relationship, accepting one’s advice to use a new HCT

facilitated higher intentions. An example quote is *“No. Well it depends on what their background is for one thing but some you know I have a very very good friend who is so focused on every little ache and pain and every little issue I would I wouldn't do it because she told me to...”*, *“Because I really don't care what friends you know friends have to say about any healthcare technology or procedure...”*, and *“More so if it was my doctor than my family. Who the Sam Hill do they think they are? They're not doctors.”* Accepting one's advice was especially critical if the individual trust that person. Some responses to the question, *“This technology is recommended by your healthcare provider, does this make you more likely to use it?”* were *“Mhmm. Cus they're the experts and we tend to trust doctors”* and *“Yeah. If he suggested like I say, I trust my doctor. Whatever he says. If he tells me I gotta take these pills. Okay, I'm gonna do that.”*

One's initial reaction of the HCT included information on some, if not all, of the primary factors used in other models of technology acceptance to inform their decision on if they are willing to accept or not accept a technology. An example quote is, *“Well, I think it would be a good reminder for people that don't take their blood pressure at a regular basis like they're supposed to, which might be me. But, uh, let's see, I'm trying to think... Well, it seems like they made it fairly simple that, I mean it doesn't entail too much for the person to do a whole lot, and the robot takes care of ordering the medicine and all that. I would think I was lazy, would be one thing I would think about that I might feel. So, but it's a good reminder and it also would be good for someone who may be not very mobile, that they can't get around, but my husband has a little trouble walking, so it might be easier for someone that has more health problems. Right at this moment, I can still get up and walk around, but I think it'd be a great thing for a lot of people, if that would help them better control their blood pressure.”*

## CHAPTER 7: DISCUSSION

With the increasing number of older adults in the US aging into having (multiple) chronic diseases, it is important to understand ways that they can be supported in managing their health. One possible way is by using HCTs. For these technologies to be useful, one must accept these technologies into their lives. To help understand the acceptance of these technologies, it is first important to understand the intentions to accept or not accept. Generally, previous research suggests that factors in the context of technology acceptance are perceived usefulness, perceived ease of use, social influence, facilitating conditions, and user/contextual characteristics (moderating variables; Chen & Chan, 2014; Venkatesh et al., 2003; Venkatesh, Thong, & Xu, 2012). However, none of the current models of technology acceptance focus on older adults and HCTs, resulting in the possibility of missing components that help to define factors that are currently in the literature. Thus, understanding the factors influencing intentions to accept or not accept HCTs is critical. A summary of the key findings from this study and the implications of these findings are presented in the following sections.

### 7.1 Summary of Results

The frequency of factors mentioned provided insights into the most and least commonly mentioned factors that were identified as facilitators and barriers. There was also the transition category that illustrate where more information should be elicited to ensure an informed decision about intentions to use HCTs. Twenty-one factors were considered as facilitators; twenty factors were considered as barriers and nine transitions. The conceptual model of H-TAM was developed based on the identified factors to understand what older adults consider in the context of HCT when presented with a new HCT.

The top two most mentioned facilitators (advantages and easy to use) related directly to perceived usefulness and perceived ease of use. These findings coincide with what is commonly portrayed in other models of technology acceptance (Chen & Chan, 2014; Davis, 1989; Venkatesh, Thong, & Xu, 2012). When examining the facilitators by HCT, the blood pressure monitor was mentioned more for easy to use and familiar. The top three most mentioned barriers mostly related directed to perceived usefulness. Although four out of five of these factors, like facilitators, coincide with perceived usefulness and perceived ease of use, having one that relates to facilitating conditions illustrates that having some help is essential to decrease the barriers to intentions to acceptance. Of the transitions, these factors mainly related to subjective influence or not having enough information (e.g., lack of privacy concerns) to make an informed decision about their intentions to use. It is important to note that these results regarding the transitions are specific to this study, but each factor included transitions. Although these factors are not commonly looked at in models of technology acceptance, it is important to understand how transitions can change into facilitator or a barrier.

New factors that were included in the H-TAM based on what emerged from the semi-structured interviews were familiarity, perceived need (including temporal changes), perceived benefits, advice acceptance, and trust.

Being familiar with the technology was frequently mentioned as a consideration related to intentions to use a new HCT. The more familiar the technology was, the more likely the participant was going to use the new HCT. The less familiar the technology was, the less likely the participant was going to use the new HCT. Being familiar with the technology can influence one's intentions to use that technology whereas having a lack of experience will decrease one's intentions and turn the facilitator into a barrier (Jimison et al., 2008; Mahmood et al., 2008). It is



suggested that to change this barrier into a facilitator, it is important to introduce the technology over a period of time to modify one's intentions to use the technology (Azjen, 1987; Jimison et al., 2008).

Perceived need can be thought of in three ways: good for others, good for me, not good for me (right now). Perceived need was mentioned the most when understanding the barriers to one's intentions to accept a new HCT rather than as a facilitator. This is not new information since it is less likely for someone to use a technology that does not address their current needs (Thielke et al., 2012). This includes temporal changes due to the user not needing the technology currently, but in the future, they may need it as their ability change. To change this barrier into a facilitator, one must aim to illustrate that the technology fits the user's needs and can adapt as their needs change.

Understanding the advantages of using the technology was the most mentioned facilitator to one's intentions to use a new HCT. Knowing the concrete benefits of using a technology can help to reduce the concerns that one may have that can later increase their acceptance of the technology (Peek et al., 2014). To ensure that this does not turn into a barrier, it is important to portray the benefits of using these technologies before usage to help facilitate positive intentions of using the technology later in life.

Advice Acceptance is a new factor that is not in the technology acceptance literature. This factor helps define social influence by understanding how one's intentions may change based on the recommendation given from one's care network. Among healthcare provider, family, and friends, participants in this study rated that they were more likely to accept HCTs if their healthcare provider recommended it to them (facilitator). Advice acceptance from a healthcare

provider was also the least frequently mentioned out of the three groups of people as a barrier. This is partially due to older adults trusting their healthcare provider due to their relationship, which coincides with the participants' ratings on the MHLC-Form C. Participants rated their health condition was due to chance but also due to their doctors. Within the Patient-Physician relationship, there are mandates of trust (Skirbekk, Middelthon, Hjortdahl, & Finset, 2011). Patients keep control of this relationship by having limitations on the trust relationships, aka mandates of trust. A patient's trust in a physician is implicit but also conditional based on the consultation (topics that they believe are important), the medical history, and their relationship (the physician's involvement in a patient and their illness is important). Patients test their physicians to see if their trust is justified which modifies the acceptance of the physician's judgment. Patients with more complex illnesses gave more open mandates of trust. Open mandates were given if the patient wanted to speak more openly about their illness, were treated with respect, and if the physician took an interest in the patient and their specific illness(es) early in their relationship. It gives the physician an opportunity to be able to be more direct with the patient about their perspectives, but it is more vulnerable to feelings of betrayal.

Advice acceptance from family members was perceived quite differently although the literature shows that spouses, children, and grandchildren can influence the intentions and acceptance of a technology (Luijkx, Peek, & Wouters, 2015). Participants in this study believed that their family members would have positive feelings towards them using it, but it did not increase their chance of using the technology compared to if their healthcare provider recommended it. This response coincides with the participants' ratings on the MHLC-Form C, which illustrates that the participants believed that powerful others did not cause their health condition but more so due to themselves and by chance.

## **7.2 Limitations and Future Directions**

Although findings from this study give insight into what factors are important to older adults in the context of HCTs, it is important to note the limitations and the future directions of this study. This study focused on older adults and developing a model that included this user group. However, other user groups should be explored in the context of HCTs, such as caregivers and physicians.

Semi-structured interviews were conducted to understand what factors may emerge that are important to this user group and this context. By collecting qualitative data, information is being collected to gain awareness of what may be studied later. The findings from this study will justify the further examination of H-TAM on a larger scale using mixed methods to help strengthen generalizability and to justify the structure of the model and factors that may be applied to different populations in this context. While 23 participants are enough for a sample size in a qualitative analysis, a larger more diverse sample size is recommended. Ultimately, future research in this domain would help with understanding what factors to manipulate to change older adults' initial intentional acceptance decisions of HCTs. Additionally, future research will include researching other conditions (e.g., cancer and stroke), user groups (e.g., caregivers and physicians), the transition category, and the temporal changes in the context of HCTs to develop a more wholistic model.

## **CHAPTER 8: CONCLUSIONS**

Whereas previous literature on technology acceptance has explored what factors may contribute to acceptance among older adults and/or in the domain of HCTs, it is still not understood what factors contribute to both older adults' intentions to accept or not accept HCTs. Findings from this study depict that familiarity, perceived need, perceived benefit, trust in the person, advice acceptance, and trust are the new factors. Moreover, many of these factors were considered by older adults during their initial reactions to the HCTs. This study validated factors that emerged in the literature regarding older adults and/or technology acceptance. Findings from this study lay the foundational steps for future research in HCT acceptance among older adults by understanding what factors are important to this population in this context.

## REFERENCES

- Ajzen, I. (1991). The theory of planned behavior. *Organizational behavior and human decision processes*, 50(2), 179-211. doi: 10.1016/0749-5978(91)90020-T
- Barg-Walkow, L. H., Mitzner, T. L., & Rogers, W. A. (2014). *Technology Experience Profile (TEP): Assessment and Scoring Guide* (HFA-TR-1402) Atlanta, GA: Georgia Institute of Technology, School of Psychology, Human Factors and Aging Laboratory.
- Banerjee, M., Capozzoli, M., McSweeney, L., & Sinha, D. (1999). Beyond kappa: A review of interrater agreement measures. *Canadian journal of statistics*, 27(1), 3-23. doi: 10.2307/3315487
- Berkowsky, R. W., Sharit, J., & Czaja, S. J. (2018). Factors predicting decisions about technology adoption among older adults. *Innovation in aging*, 1(3), 1-12. doi: 10.1093/geroni/igy002
- Brennan, R. L., & Prediger, D. J. (1981). Coefficient kappa: Some uses, misuses, and alternatives. *Educational and psychological measurement*, 41(3), 687-699. doi: 10.1177/001316448104100307
- Broadbent, E., Stafford, R., & MacDonald, B. (2009). Acceptance of healthcare robots for the older population: Review and future directions. *International journal of social robotics*, 1(4), 319-330. doi: 10.1007/s12369-009-0030-6
- American association of retired persons. (2009). *A Call to Action for Health Reform*. Retrieved from [https://assets.aarp.org/rgcenter/health/beyond\\_50\\_hcr.pdf](https://assets.aarp.org/rgcenter/health/beyond_50_hcr.pdf)
- Centers for Disease Control and Prevention. (2018, August 14). *Multiple Chronic Conditions*. Retrieved from <https://www.cdc.gov/chronicdisease/about/multiple-chronic.htm>
- Centers for Disease Control and Prevention. (2017, February 10). *Important Facts about Falls*. Retrieved from <https://www.cdc.gov/HomeandRecreationalSafety/Falls/adultfalls.html>
- Centers for Medicare and Medicaid Services. (2012). *Chronic Conditions among Medicare Beneficiaries, Chartbook, 2012 Edition*. Baltimore, MD. Center for Medicare & Medicaid Services.
- Chen, K., & Chan, A. H. S. (2014). Gerontechnology acceptance by elderly Hong Kong Chinese: a senior technology acceptance model (STAM). *Ergonomics*, 57(5), 635-652. doi: 10.1080/00140139.2014.895855
- Czaja, S. J., Charness, N., Fisk, A. D., Hertzog, C., Nair, S. N., Rogers, W. A., & Sharit, J. (2006). Factors predicting the use of technology: findings from the Center for Research and Education on Aging and Technology Enhancement (CREATE). *Psychology and aging*, 21(2), 333-352. doi: 10.1037/0882-7974.21.2.333

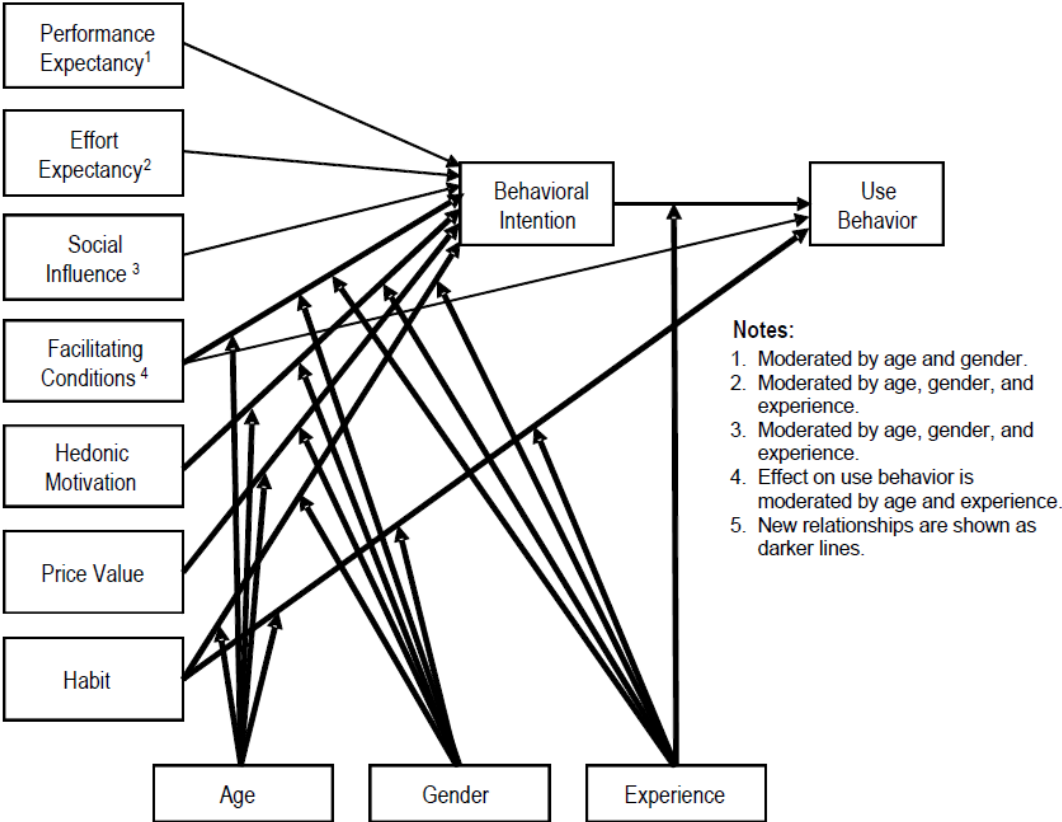
- Charness, N., & Boot, W. R. (2009). Aging and information technology use: Potential and barriers. *Current Directions in Psychological Science*, 18(5), 253-258. doi: 10.1111/j.1467-8721.2009.01647.x
- Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *Management Information Systems quarterly* 13(3), 319-340. doi: 10.2307/249008
- de Jager, C. A., Budge, M. M., & Clarke, R. (2003). Utility of TICS-M for the assessment of cognitive function in older adults. *International journal of geriatric psychiatry*, 18(4), 318-324. doi: 10.1002/gps.830
- Dworkin, S. L. (2012). Sample size policy for qualitative studies using in-depth interviews. *Archives of sexual behavior*, 42(6), 1319-1320. doi: 10.1007/s10508-012-0016-6
- Jimison, H., Gorman, P., Woods, S., Nygren, P., Walker, M., Norris, S., & Hersh, W. (2008). Barriers and drivers of health information technology use for the elderly, chronically ill, and underserved. *International journal of medical informatics*, 89(9), 624-635. doi: 10.1016/j.ijmedinf.2014.06.005
- Kakulla, Brittnie Nelson. (2019) *2019 Tech Trends and the 50+*. Washington, DC: AARP Research, January 2019. doi: [10.26419/res.00269.001](https://doi.org/10.26419/res.00269.001)
- Karahanna, E., & Straub, D. W. (1999). The psychological origins of perceived usefulness and ease-of-use. *Information & Management*, 35(4), 237-250. doi: 10.1016/S0378-7206(98)00096-2
- Kincey, J., Bradshaw, P., & Ley, P. (1975). Patients' satisfaction and reported acceptance of advice in general practice. *Journal of the Royal College of General Practitioners*, 25(157), 558-566. Retrieved from <https://bjgp.org/content/25/157/558>
- Lee, C., & Coughlin, J. F. (2015). PERSPECTIVE: Older adults' adoption of technology: an integrated approach to identifying determinants and barriers. *Journal of Product Innovation Management*, 32(5), 747-759. doi: 10.1111/jpim.12176
- Lippert, S. K., & Davis, M. (2006). A conceptual model integrating trust into planned change activities to enhance technology adoption behavior. *Journal of information science*, 32(5), 434-448. doi: 10.1177/0165551506066042
- Lorenzen-Huber, L., Boutain, M., Camp, L. J., Shankar, K., & Connelly, K. H. (2011). Privacy, technology, and aging: A proposed framework. *Ageing International*, 36(2), 232-252. doi: 10.1007/s12126-010-9083-y
- Luijckx, K., Peek, S., & Wouters, E. (2015). “Grandma, you should do it—It’s cool” Older Adults and the Role of Family Members in Their Acceptance of Technology. *International journal of environmental research and public health*, 12(12), 15470-15485. doi: 10.3390/ijerph121214999

- Mahmood, A., Yamamoto, T., Lee, M., & Steggell, C. (2008). Perceptions and use of gerotechnology: Implications for aging in place. *Journal of Housing for the Elderly*, 22(1-2), 104-126. doi: 10.1080/02763890802097144
- Mitzner, T. L., Boron, J. B., Fausset, C. B., Adams, A. E., Charness, N., Czaja, S. J., ... & Sharit, J. (2010). Older adults talk technology: Technology usage and attitudes. *Computers in human behavior*, 26(6), 1710-1721. doi: 10.1016/j.chb.2010.06.020
- Mitzner, T. L., Bixter, M. T., & Rogers, W.A. (2016). *Qualitative Research Procedures in the Human Factors and Aging Laboratory* (HFA-TR-1601). Atlanta, GA: Georgia Institute of Technology, School of Psychology, Human Factors and Aging Laboratory.
- Moore, G. C., & Benbasat, I. (1991). Development of an instrument to measure the perceptions of adopting an information technology innovation. *Information systems research*, 2(3), 192-222. doi: 10.1287/isre.2.3.192
- National Heart, Lung, and Blood Institute (2018, May 17). *High Blood Pressure*. Retrieved from <https://www.nhlbi.nih.gov/health-topics/high-blood-pressure>
- Ortman, Jennifer M., Victoria A. Velkoff, and Howard Hogan. (2014) *An Aging Nation: The Older Population in the United States, Current Population Reports*, (Report No. P25-1140). U.S. Census Bureau, Washington, DC: United States Census Bureau.
- Parasuraman, A., & Colby, C. L. (2014). An updated and streamlined technology readiness index: TRI 2.0. *Journal of Service Research*, 18(1), 59-74. doi: 10.1177/1094670514539730
- Peek, S. T., Wouters, E. J., van Hoof, J., Luijkx, K. G., Boeije, H. R., & Vrijhoef, H. J. (2014). Factors influencing acceptance of technology for aging in place: a systematic review. *International journal of medical informatics*, 83(4), 235-248. doi: 10.1016/j.ijmedinf.2014.01.004
- Phang, C. W., Li, Y., Sutanto, J., & Kankanhalli, A. (2005, January). Senior citizens' adoption of E-government: In quest of the antecedents of perceived usefulness. In *Proceedings of the 38th annual Hawaii international conference on system sciences* (pp. 130a-130a). IEEE.
- Renaud, K., & Van Biljon, J. (2008, October). Predicting technology acceptance and adoption by the elderly: a qualitative study. In *Proceedings of the 2008 annual research conference of the South African Institute of Computer Scientists and Information Technologists on IT research in developing countries: riding the wave of technology* (pp. 210-219). ACM.
- Szajna, B. (1996). Empirical evaluation of the revised technology acceptance model. *Management science*, 42(1), 85-92. doi: 10.1287/mnsc.42.1.85
- Swol, L. M., & Sniezek, J. A. (2005). Factors affecting the acceptance of expert advice. *British Journal of Social Psychology*, 44(3), 443-461. doi: 10.1348/014466604X17092

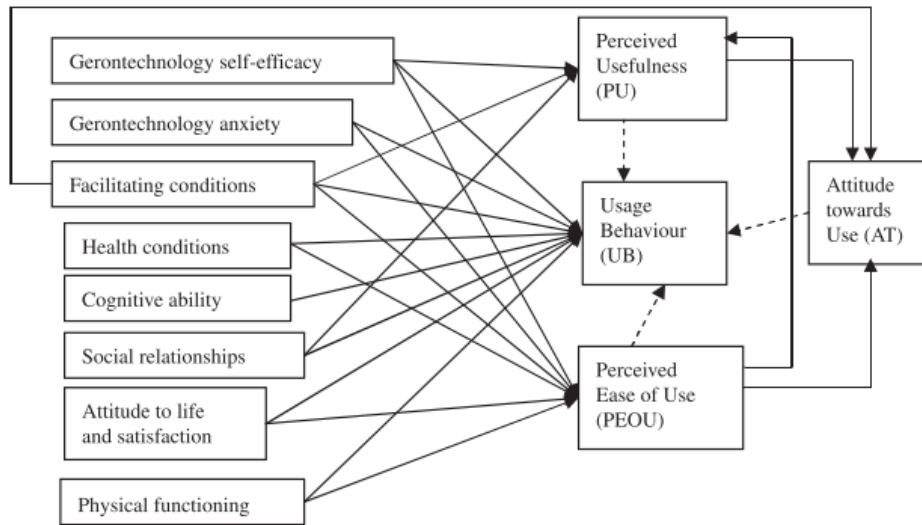
- Thielke, S., Harniss, M., Thompson, H., Patel, S., Demiris, G., & Johnson, K. (2012). Maslow's hierarchy of human needs and the adoption of health-related technologies for older adults. *Ageing international*, 37(4), 470-488. doi: 10.1007/s12126-011-9121-4
- Trotter, R. T. (2012). Qualitative research sample design and sample size: Resolving and unresolved issues and inferential imperatives. *Preventive medicine*, 55(5), 398-400. doi: 10.1016/j.ypmed.2012.07.003
- Venkatesh, V., Morris, M. G., Davis, G. B., & Davis, F. D. (2003). User acceptance of information technology: Toward a unified view. *Management Information Systems Quarterly*, 27(3), 425-478. doi: 10.2307/30036540
- Venkatesh, V., Thong, J. Y., & Xu, X. (2012). Consumer acceptance and use of information technology: extending the unified theory of acceptance and use of technology. *Management Information Systems Quarterly*, 36(1), 157-178. Retrieved from [https://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=2002388](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2002388)
- Wallston, K. A., Stein, M. J., & Smith, C. A. (1994). Form C of the MHLC scales: a condition-specific measure of locus of control. *Journal of personality assessment*, 63(3), 534-553. doi: 10.1207/s15327752jpa6303\_10



**APPENDIX A—UNIFIED THEORY OF ACCEPTANCE AND USE OF TECHNOLOGY 2**



## APPENDIX B – SENIOR TECHNOLOGY ACCEPTANCE MODEL



Controlled variables: age, gender, education level, and economic status

**APPENDIX C - IRB PACKET**

**Understanding Older Adults' Intentions to Use Healthcare Technologies**

**Interview Checklist**

Participant ID:	
Interviewer Initials:	
Date:	
General notes about interview:	
<b>Interviewer Will Need:</b>	
	Consent Form
	Audio Recorder
	Interview Script
	Set of Questionnaires (Demographic, MHLC, TRI, TEQ)
	Healthcare Technologies' Descriptions
	Debriefing Form
	Pens/Pencils
	Water
	Compensation (Cash or Amazon E-Code)
	Lay out all protocol materials on the table
<b>Data Management:</b>	
	Upload audio files to Box (HFA- Research Projects- Healthcare Tech Interview - Data)
	Delete audio recording from recording device after listening for completion
	Place all other files in the filing cabinet (Labeled by Participant ID)
	Review all questionnaires for completeness

**Understanding Older Adults' Intentions to Use Healthcare Technologies  
Interview Study Consent Form  
University of Illinois at Urbana-Champaign**

**Project Title:** Understanding Older Adults' Intentions to Use Healthcare Technologies

**Investigators:** Dr. Wendy A. Rogers (Principal Investigator) and Maurita Harris (Student Researcher)

**Protocol and Consent Title:** Understanding Older Adults' Intentions to Use Healthcare Technologies

**Purpose:**

The purpose of this research study is to explore the factors that influence older adults' intentions to use healthcare technologies. We are interested in understanding your thoughts about various types of healthcare technologies and how your intentions to use these technologies may change in relation to differing characteristics. Our goal is to enroll 48 participants in this research study.

**Exclusion/Inclusion Criteria:**

Participants in this research study must:

- Be between the ages of 65-84
- Be fluent in English
- Have hypertension
- Score a 21 or higher on the Modified Telephone Interview for Cognitive Status (TICS-M)
- Live independently (e.g., without any caregivers)
- Agree with the session being recorded

**Procedures:**

The study consists of three parts: part I) two questionnaires (about 15 minutes in length); part II) interview (about 45 minutes in length); and part III) two questionnaires (about 15 minutes in length). We will take a 5-minute break after part II.

- 1. Part I:** You will complete two different questionnaires. The Technology Readiness Index 2.0 will evaluate your susceptibility to embrace new technologies. The Technology Experience Questionnaire will evaluate your previous experiences with various types of technologies.

2. **Part II:** This part will be recorded for transcription purposes. During the interview, three different types of healthcare technologies will be presented to you separately. A description of each technology is written on a sheet of paper. The interviewer will first read the descriptions to you and then you will have time after to read the description at your own pace. After you read through the description, the interviewer will then ask questions related to factors that may or may not influence your intentions. You may choose to discontinue the study at any time for any reason.
  
3. **Part III:** You will complete two different questionnaires. The basic demographic questionnaire will ask you about your background information (e.g., gender, education level, current marital status, etc.) and the Multidimensional Health Locus of Control will assess your beliefs of controlling your own health condition.

**Risks or Discomforts:**

The risks involved are no greater than those involved in daily activities such as normal office work.

**Benefits:**

Today in the United States, many older adults have been diagnosed with at least one chronic illness that they must manage. Healthcare technologies are significantly important to older adults who suffer from one or more of these chronic medical conditions. They can facilitate daily activities, increase work efficiency, reduce care burden among family caregivers, etc. Although healthcare technologies are developed to assist people in a variety of circumstances, not all people are willing to use them due to individual differences. Therefore, it is crucial to understand the factors that influence older adults' intentions to use healthcare technologies. The current research study will explore the underlying considerations of older adults' for intending to use different healthcare technologies and how their intentions may change in relation to differing complexity. **The findings from this research study will help further our understanding of what factors are important for developing healthcare technologies and eventually lead to improvements that can benefit the general population of older adults.**

**Compensation to You:**

You will be compensated with \$25 Amazon gift card for your time and effort. Participants who do not complete the research study will receive \$12.50 per hour completed.

U.S. Tax Law requires a mandatory withholding of 30% for nonresident alien payments of any type. Your address and citizenship/visa status may be collected for compensation purposes only. This information will be shared only with the Georgia Tech department that issues compensation, if any, for your participation.

**Confidentiality:**

Your privacy will be protected to the extent allowed by law. To protect your privacy, your records will be kept under a code number rather than by name. Your records will be kept in locked files and only study staff will be allowed to look at them. Your name and any other fact that might point to you will not appear when results of this study are presented or published. We are only interested in-group information. The reporting of the experimental results will only contain group mean results and will contain no personal information about individual participants including performance on the experiment. Audiotapes will be transcribed and destroyed after 7 years. No link will be maintained that could connect your identity with your responses. To make sure that this research is being carried out in the proper way, the University of Illinois at Urbana-Champaign IRB may review study records. The Office of Human Research Protections may also look over study records during required reviews.

In general, we will not tell anyone any information about you. When this research is discussed or published, no one will know that you were in the study. However, laws and university rules might require us to disclose information about you. For example, if required by laws or University Policy, study information which identifies you and the consent form signed by you may be seen or copied by the following people or groups: a) The university committee and office that reviews and approves research studies, the Institutional Review Board (IRB) and Office for Protection of Research Subjects; and b) University and state auditors, and Departments of the university responsible for oversight of research; and c) Federal government regulatory agencies such as the Office of Human Research Protections in the Department of Health and Human Services

**Costs to You:**

There are no costs to you, other than your time, for being in this study.

**In Case of Injury/Harm:**

If you are injured as a result of being in this study, please contact Dr. Wendy Rogers, Ph.D., at 217-333-1470. Neither the Principal Investigator nor the University of Illinois at Urbana-Champaign has made provision for payment of costs associated with any injury resulting from participation in this study.

**Participant Rights:**

- Your participation in this study is voluntary. You do not have to be in this study if you don't want to be.
- You have the right to change your mind and leave the study at any time without giving any reason and without penalty.
- Any new information that may make you change your mind about being in this study will be given to you.
- You will be given a copy of this consent form to keep.
- You do not waive any of your legal rights by signing this consent form.

**Questions about the Study:**

If you have any questions about the study, you may contact

- Dr. Wendy A. Rogers at 217-333-1470 or [wendyr@illinois.edu](mailto:wendyr@illinois.edu)
- Maurita Harris at 217-300-5445 or [maurita2@illinois.edu](mailto:maurita2@illinois.edu)

**Questions about Your Rights as a Research Participant:**

If you feel you have not been treated according to the descriptions in this form, or if you have any questions about your rights as a research subject, including questions, concerns, complaints, or to offer input, you may call the Office for the Protection of Research Subjects (OPRS) at 217-333-2670 or e-mail OPRS at [irb@illinois.edu](mailto:irb@illinois.edu)

If you sign below, it means that you have read (or have had read to you) the information given in this consent form, and you would like to be a volunteer in this study.

---

Participant Name (printed)

---

Signature of Person Obtaining Consent

Date

**Understanding Older Adults' Intentions to Use Healthcare Technologies  
Interview Study Consent Form  
University of Illinois at Urbana-Champaign**

**Project Title:** Understanding Older Adults' Intentions to Use Healthcare Technologies

**Investigators:** Dr. Wendy A. Rogers (Principal Investigator) and Maurita Harris (Student Researcher)

**Protocol and Consent Title:** Understanding Older Adults' Intentions to Use Healthcare Technologies

**Purpose:**

The purpose of this research study is to explore the factors that influence older adults' intentions to use healthcare technologies. We are interested in understanding your thoughts about various types of healthcare technologies and how your intentions to use these technologies may change in relation to differing characteristics. Our goal is to enroll 48 participants in this research study.

**Exclusion/Inclusion Criteria:**

Participants in this research study must:

- Be between the ages of 65-84
- Be fluent in English
- Have hypertension
- Score a 21 or higher on the Modified Telephone Interview for Cognitive Status (TICS-M)
- Live independently (e.g., without any caregivers)
- Agree with the session being recorded

**Procedures:**

The study consists of three parts: part I) two questionnaires (about 15 minutes in length); part II) interview (about 45 minutes in length); and part III) two questionnaires (about 15 minutes in length). We will take a 5-minute break after part II.

- 1. Part I:** You will complete two different questionnaires. The Technology Readiness Index 2.0 will evaluate your susceptibility to embrace new technologies. The Technology Experience Questionnaire will evaluate your previous experiences with various types of technologies.



2. **Part II:** This part will be recorded for transcription purposes. During the interview, three different types of healthcare technologies will be presented to you separately. A description of each technology is written on a sheet of paper. The interviewer will first read the descriptions to you and then you will have time after to read the description at your own pace. After you read through the description, the interviewer will then ask questions related to factors that may or may not influence your intentions. You may choose to discontinue the study at any time for any reason.
  
3. **Part III:** You will complete two different questionnaires. The basic demographic questionnaire will ask you about your background information (e.g., gender, education level, current marital status, etc.) and the Multidimensional Health Locus of Control will assess your beliefs of controlling your own health condition.

**Risks or Discomforts:**

The risks involved are no greater than those involved in daily activities such as normal office work.

**Benefits:**

Today in the United States, many older adults have been diagnosed with at least one chronic illness that they must manage. Healthcare technologies are significantly important to older adults who suffer from one or more of these chronic medical conditions. They can facilitate daily activities, increase work efficiency, reduce care burden among family caregivers, etc. Although healthcare technologies are developed to assist people in a variety of circumstances, not all people are willing to use them due to individual differences. Therefore, it is crucial to understand the factors that influence older adults' intentions to use healthcare technologies. The current research study will explore the underlying considerations of older adults' for intending to use different healthcare technologies and how their intentions may change in relation to differing complexity. **The findings from this research study will help further our understanding of what factors are important for developing healthcare technologies and eventually lead to improvements that can benefit the general population of older adults.**

**Compensation to You:**

You will be compensated with \$25 Amazon gift card for your time and effort. Participants who do not complete the research study will receive \$12.50 per hour completed.

U.S. Tax Law requires a mandatory withholding of 30% for nonresident alien payments of any type. Your address and citizenship/visa status may be collected for compensation purposes only. This information will be shared only with the Georgia Tech department that issues compensation, if any, for your participation.

**Confidentiality:**

Your privacy will be protected to the extent allowed by law. To protect your privacy, your records will be kept under a code number rather than by name. Your records will be kept in locked files and only study staff will be allowed to look at them. Your name and any other fact that might point to you will not appear when results of this study are presented or published. We are only interested in-group information. The reporting of the experimental results will only contain group mean results and will contain no personal information about individual participants including performance on the experiment. Audiotapes will be transcribed and destroyed after 7 years. No link will be maintained that could connect your identity with your responses. To make sure that this research is being carried out in the proper way, the University of Illinois at Urbana-Champaign IRB may review study records. The Office of Human Research Protections may also look over study records during required reviews.

In general, we will not tell anyone any information about you. When this research is discussed or published, no one will know that you were in the study. However, laws and university rules might require us to disclose information about you. For example, if required by laws or University Policy, study information which identifies you and the consent form signed by you may be seen or copied by the following people or groups: a) The university committee and office that reviews and approves research studies, the Institutional Review Board (IRB) and Office for Protection of Research Subjects; and b) University and state auditors, and Departments of the university responsible for oversight of research; and c) Federal government regulatory agencies such as the Office of Human Research Protections in the Department of Health and Human Services

**Costs to You:**

There are no costs to you, other than your time, for being in this study.

**In Case of Injury/Harm:**

If you are injured as a result of being in this study, please contact Dr. Wendy Rogers, Ph.D., at 217-333-1470. Neither the Principal Investigator nor the University of Illinois at Urbana-Champaign has made provision for payment of costs associated with any injury resulting from participation in this study.

**Participant Rights:**

- Your participation in this study is voluntary. You do not have to be in this study if you don't want to be.
- You have the right to change your mind and leave the study at any time without giving any reason and without penalty.
- Any new information that may make you change your mind about being in this study will be given to you.
- You will be given a copy of this consent form to keep.
- You do not waive any of your legal rights by signing this consent form.

**Questions about the Study:**

If you have any questions about the study, you may contact

- Dr. Wendy A. Rogers at 217-333-1470 or [wendyr@illinois.edu](mailto:wendyr@illinois.edu)
- Maurita Harris at 217-300-5445 or [maurita2@illinois.edu](mailto:maurita2@illinois.edu)

**Questions about Your Rights as a Research Participant:**

If you feel you have not been treated according to the descriptions in this form, or if you have any questions about your rights as a research subject, including questions, concerns, complaints, or to offer input, you may call the Office for the Protection of Research Subjects (OPRS) at 217-333-2670 or e-mail OPRS at [irb@illinois.edu](mailto:irb@illinois.edu)

If you sign below, it means that you have read (or have had read to you) the information given in this consent form, and you would like to be a volunteer in this study.

---

Participant Name (printed)

---

Participant Signature Date

---

Signature of Person Obtaining Consent Date

**Understanding Older Adults' Intentions to Use Healthcare Technologies  
Interview Study Consent Form  
University of Illinois at Urbana-Champaign**

**Project Title:** Understanding Older Adults' Intentions to Use Healthcare Technologies

**Investigators:** Dr. Wendy A. Rogers (Principal Investigator) and Maurita Harris (Student Researcher)

**Protocol and Consent Title:** Understanding Older Adults' Intentions to Use Healthcare Technologies

**Purpose:**

The purpose of this research study is to explore the factors that influence older adults' intentions to use healthcare technologies. We are interested in understanding your thoughts about various types of healthcare technologies and how your intentions to use these technologies may change in relation to differing characteristics. Our goal is to enroll 48 participants in this research study.

**Exclusion/Inclusion Criteria:**

Participants in this research study must:

- Be between the ages of 65-84
- Be fluent in English
- Have hypertension
- Score a 21 or higher on the Modified Telephone Interview for Cognitive Status (TICS-M)
- Live independently (e.g., without any caregivers)
- Agree with the session being recorded

**Procedures:**

The study consists of three parts: part I) two questionnaires (about 15 minutes in length); part II) interview (about 45 minutes in length); and part III) two questionnaires (about 15 minutes in length). We will take a 5-minute break after part II.

- 1. Part I:** You will complete two different questionnaires. The Technology Readiness Index 2.0 will evaluate your susceptibility to embrace new technologies. The Technology Experience Questionnaire will evaluate your previous experiences with various types of technologies.

2. **Part II:** This part will be recorded for transcription purposes. During the interview, three different types of healthcare technologies will be presented to you separately. A description of each technology is written on a sheet of paper. The interviewer will first read the descriptions to you and then you will have time after to read the description at your own pace. After you read through the description, the interviewer will then ask questions related to factors that may or may not influence your intentions. You may choose to discontinue the study at any time for any reason.
3. **Part III:** You will complete two different questionnaires. The basic demographic questionnaire will ask you about your background information (e.g., gender, education level, current marital status, etc.) and the Multidimensional Health Locus of Control will assess your beliefs of controlling your own health condition.

**Risks or Discomforts:**

The risks involved are no greater than those involved in daily activities such as normal office work.

**Benefits:**

Today in the United States, many older adults have been diagnosed with at least one chronic illness that they must manage. Healthcare technologies are significantly important to older adults who suffer from one or more of these chronic medical conditions. They can facilitate daily activities, increase work efficiency, reduce care burden among family caregivers, etc. Although healthcare technologies are developed to assist people in a variety of circumstances, not all people are willing to use them due to individual differences. Therefore, it is crucial to understand the factors that influence older adults' intentions to use healthcare technologies. The current research study will explore the underlying considerations of older adults' for intending to use different healthcare technologies and how their intentions may change in relation to differing complexity. **The findings from this research study will help further our understanding of what factors are important for developing healthcare technologies and eventually lead to improvements that can benefit the general population of older adults.**

**Compensation to You:**

You will be compensated with \$25 Amazon gift card for your time and effort. Participants who do not complete the research study will receive \$12.50 per hour completed.

U.S. Tax Law requires a mandatory withholding of 30% for nonresident alien payments of any type. Your address and citizenship/visa status may be collected for compensation purposes only. This information will be shared only with the Georgia Tech department that issues compensation, if any, for your participation.

**Confidentiality:**

Your privacy will be protected to the extent allowed by law. To protect your privacy, your records will be kept under a code number rather than by name. Your records will be kept in locked files and only study staff will be allowed to look at them. Your name and any other fact that might point to you will not appear when results of this study are presented or published. We are only interested in-group information. The reporting of the experimental results will only contain group mean results and will contain no personal information about individual participants including performance on the experiment. Audiotapes will be transcribed and destroyed after 7 years. No link will be maintained that could connect your identity with your responses. To make sure that this research is being carried out in the proper way, the University of Illinois at Urbana-Champaign IRB may review study records. The Office of Human Research Protections may also look over study records during required reviews.

In general, we will not tell anyone any information about you. When this research is discussed or published, no one will know that you were in the study. However, laws and university rules might require us to disclose information about you. For example, if required by laws or University Policy, study information which identifies you and the consent form signed by you may be seen or copied by the following people or groups: a) The university committee and office that reviews and approves research studies, the Institutional Review Board (IRB) and Office for Protection of Research Subjects; and b) University and state auditors, and Departments of the university responsible for oversight of research; and c) Federal government regulatory agencies such as the Office of Human Research Protections in the Department of Health and Human Services

**Costs to You:**

There are no costs to you, other than your time, for being in this study.

**In Case of Injury/Harm:**

If you are injured as a result of being in this study, please contact Dr. Wendy Rogers, Ph.D., at 217-333-1470. Neither the Principal Investigator nor the University of Illinois at Urbana-Champaign has made provision for payment of costs associated with any injury resulting from participation in this study.

**Participant Rights:**

- Your participation in this study is voluntary. You do not have to be in this study if you don't want to be.
- You have the right to change your mind and leave the study at any time without giving any reason and without penalty.
- Any new information that may make you change your mind about being in this study will be given to you.
- You will be given a copy of this consent form to keep.
- You do not waive any of your legal rights by signing this consent form.

**Questions about the Study:**

If you have any questions about the study, you may contact

- Dr. Wendy A. Rogers at 217-333-1470 or [wendyr@illinois.edu](mailto:wendyr@illinois.edu)
- Maurita Harris at 217-300-5445 or [maurita2@illinois.edu](mailto:maurita2@illinois.edu)

**Questions about Your Rights as a Research Participant:**

If you feel you have not been treated according to the descriptions in this form, or if you have any questions about your rights as a research subject, including questions, concerns, complaints, or to offer input, you may call the Office for the Protection of Research Subjects (OPRS) at 217-333-2670 or e-mail OPRS at [irb@illinois.edu](mailto:irb@illinois.edu)

If you sign below, it means that you have read (or have had read to you) the information given in this consent form, and you would like to be a volunteer in this study.

---

Participant Name (printed)

---

Signature of Person Obtaining Consent

Date

**Understanding Older Adults' Intentions to Use Healthcare Technologies  
Interview Study Consent Form  
University of Illinois at Urbana-Champaign**

**Project Title:** Understanding Older Adults' Intentions to Use Healthcare Technologies

**Investigators:** Dr. Wendy A. Rogers (Principal Investigator) and Maurita Harris (Student Researcher)

**Protocol and Consent Title:** Understanding Older Adults' Intentions to Use Healthcare Technologies

**Purpose:**

The purpose of this research study is to explore the factors that influence older adults' intentions to use healthcare technologies. We are interested in understanding your thoughts about various types of healthcare technologies and how your intentions to use these technologies may change in relation to differing characteristics. Our goal is to enroll 48 participants in this research study.

**Exclusion/Inclusion Criteria:**

Participants in this research study must:

- Be between the ages of 65-84
- Be fluent in English
- Have hypertension
- Score a 21 or higher on the Modified Telephone Interview for Cognitive Status (TICS-M)
- Live independently (e.g., without any caregivers)
- Agree with the session being recorded

**Procedures:**

The study consists of three parts: part I) two questionnaires (about 15 minutes in length); part II) interview (about 45 minutes in length); and part III) two questionnaires (about 15 minutes in length). We will take a 5-minute break after part II.

- 1. Part I:** You will complete two different questionnaires. The Technology Readiness Index 2.0 will evaluate your susceptibility to embrace new technologies. The Technology Experience Questionnaire will evaluate your previous experiences with various types of technologies.



2. **Part II:** This part will be recorded for transcription purposes. During the interview, three different types of healthcare technologies will be presented to you separately. A description of each technology is written on a sheet of paper. The interviewer will first read the descriptions to you and then you will have time after to read the description at your own pace. After you read through the description, the interviewer will then ask questions related to factors that may or may not influence your intentions. You may choose to discontinue the study at any time for any reason.
  
3. **Part III:** You will complete two different questionnaires. The basic demographic questionnaire will ask you about your background information (e.g., gender, education level, current marital status, etc.) and the Multidimensional Health Locus of Control will assess your beliefs of controlling your own health condition.

**Risks or Discomforts:**

The risks involved are no greater than those involved in daily activities such as normal office work.

**Benefits:**

Today in the United States, many older adults have been diagnosed with at least one chronic illness that they must manage. Healthcare technologies are significantly important to older adults who suffer from one or more of these chronic medical conditions. They can facilitate daily activities, increase work efficiency, reduce care burden among family caregivers, etc. Although healthcare technologies are developed to assist people in a variety of circumstances, not all people are willing to use them due to individual differences. Therefore, it is crucial to understand the factors that influence older adults' intentions to use healthcare technologies. The current research study will explore the underlying considerations of older adults' for intending to use different healthcare technologies and how their intentions may change in relation to differing complexity. **The findings from this research study will help further our understanding of what factors are important for developing healthcare technologies and eventually lead to improvements that can benefit the general population of older adults.**

**Compensation to You:**

You will be compensated with \$25 Amazon gift card for your time and effort. Participants who do not complete the research study will receive \$12.50 per hour completed.

U.S. Tax Law requires a mandatory withholding of 30% for nonresident alien payments of any type. Your address and citizenship/visa status may be collected for compensation purposes only. This information will be shared only with the Georgia Tech department that issues compensation, if any, for your participation.

**Confidentiality:**

Your privacy will be protected to the extent allowed by law. To protect your privacy, your records will be kept under a code number rather than by name. Your records will be kept in locked files and only study staff will be allowed to look at them. Your name and any other fact that might point to you will not appear when results of this study are presented or published. We are only interested in-group information. The reporting of the experimental results will only contain group mean results and will contain no personal information about individual participants including performance on the experiment. Audiotapes will be transcribed and destroyed after 7 years. No link will be maintained that could connect your identity with your responses. To make sure that this research is being carried out in the proper way, the University of Illinois at Urbana-Champaign IRB may review study records. The Office of Human Research Protections may also look over study records during required reviews.

In general, we will not tell anyone any information about you. When this research is discussed or published, no one will know that you were in the study. However, laws and university rules might require us to disclose information about you. For example, if required by laws or University Policy, study information which identifies you and the consent form signed by you may be seen or copied by the following people or groups: a) The university committee and office that reviews and approves research studies, the Institutional Review Board (IRB) and Office for Protection of Research Subjects; and b) University and state auditors, and Departments of the university responsible for oversight of research; and c) Federal government regulatory agencies such as the Office of Human Research Protections in the Department of Health and Human Services

**Costs to You:**

There are no costs to you, other than your time, for being in this study.

**In Case of Injury/Harm:**

If you are injured as a result of being in this study, please contact Dr. Wendy Rogers, Ph.D., at 217-333-1470. Neither the Principal Investigator nor the University of Illinois at Urbana-Champaign has made provision for payment of costs associated with any injury resulting from participation in this study.

**Participant Rights:**

- Your participation in this study is voluntary. You do not have to be in this study if you don't want to be.
- You have the right to change your mind and leave the study at any time without giving any reason and without penalty.
- Any new information that may make you change your mind about being in this study will be given to you.
- You will be given a copy of this consent form to keep.
- You do not waive any of your legal rights by signing this consent form.

**Questions about the Study:**

If you have any questions about the study, you may contact

- Dr. Wendy A. Rogers at 217-333-1470 or [wendyr@illinois.edu](mailto:wendyr@illinois.edu)
- Maurita Harris at 217-300-5445 or [maurita2@illinois.edu](mailto:maurita2@illinois.edu)

**Questions about Your Rights as a Research Participant:**

If you feel you have not been treated according to the descriptions in this form, or if you have any questions about your rights as a research subject, including questions, concerns, complaints, or to offer input, you may call the Office for the Protection of Research Subjects (OPRS) at 217-333-2670 or e-mail OPRS at [irb@illinois.edu](mailto:irb@illinois.edu)

If you sign below, it means that you have read (or have had read to you) the information given in this consent form, and you would like to be a volunteer in this study.

---

Participant Name (printed)

---

Participant Signature Date

---

Signature of Person Obtaining Consent Date

## **Understanding Older Adults' Intentions to Use Healthcare Technologies Home or Lab Interview Script**

*Italics = items or reminders (not to be said to the participants)*

**Red** = actions (not to be said to the participants)

### **Greet Participants**

- Meet participants in Human Factors & Aging Laboratory of Khan Annex in Huff Hall on the University of Illinois at Urbana-Champaign campus or at their preferred location.*
- Ask participants if they would like to use the restroom.*

### **General Introduction**

Thank you for participating in this study. Before we get started, I would like you to please turn off your cell phone, so we do not have any interruptions. Thank you.

My name is \_\_\_\_\_ and I will be assisting with today's interview. The study consists of three parts and the total estimated duration of the study is 1 hour and 30 minutes.

- Part I will take about 15 minutes. You will be asked to complete two different questionnaires. You may use a pen or pencil to answer these questions.
- Part II involves the interview and will take about 45 minutes. Three descriptions of three different types of healthcare technologies will be presented to you separately. First, I will read the description with you following along and then you will have time to review the description at your leisure. Following that, we will talk about whether you intend to use it and why. Once the interview is completed, we will take a 5-minute break.
- Part III will take about 30 minutes. You will complete another set of questionnaires where you may use a pen or pencil to answer.

### **Give participants the consent form and a pen/pencil**

This is the consent form. Please read it carefully and feel free to ask any questions that you may have. If you do not have any questions, you can sign your name and the date at the end of the form.

- Collect form when they finish**

Do you have any questions about the study before we start?

- If yes, answer**
- If no, continue**

Let's begin part 1 of the study.

### **Part I**

The first questionnaire is called the Technology Readiness Index. The instructions are at the top of the page. Feel free to ask any questions that you may have.

- Give participants the TRI questionnaire
- Use TRI instruction to administer each question
- Collect when they finish

Okay, the last questionnaire in part one is the Technology Experience Profile. The instructions are on the first page. If you have any questions while you are answering this questionnaire, feel free to let me know and I will answer them.

- Give participants the TEP
- Collect when they finish

Great! That concludes the first part of the session. Now moving on to part II.

## **Part II**

During this part of the study, your verbal responses will be recorded to understand your intentions to accept healthcare technologies. I am now going to start the recorder.

*<Turn on recorder>*

### **Icebreaker:**

Let's start by talking about your experience with healthcare technology. Healthcare technology allows the individual to manage aspects of their health, such as, medication management, medical appointments, health records, exercise, and nutrition.

1. What was the last healthcare technology that you used and what did you use it for?

For this interview, one thing that we are interested in is understanding how you decide whether or not use a healthcare technology.

Before we start, I would like to go over some guidelines for this conversation.

### **Guidelines:**

- First, in order to be consistent between participants, I am required to read directly from this script. Questions may sound formal or repetitive and that is okay. It is also okay if your answers seem repetitive.
- I am interested in capturing your current and personal experiences. So say whatever ideas and opinions that comes to your mind first. If there is anything that you do not wish to discuss, we can always skip that question. Please just let me know.
- Your responses are completely confidential.
- There are no right or wrong answers, so please feel free to express your opinion, to the best of your ability.

Following our conversation, we will take a 5-minute break. If you would like to take a restroom break during our conversation, let me know and I will pause the recorder.

We will first start with a situation for you to imagine. Then I will give you the description of the technology. I will first read the description while you follow along and then you will have time to read over it by yourself and ask any questions that you may have.

**Situation:** Imagine you have high blood pressure and your healthcare provider recommends that you begin to monitor your blood pressure two times every day.

- Hand description of blood pressure monitor.**
- If you have any questions about the functions or purpose of this technology as you read the description, feel free to ask me.

*Begin asking the following questions. Ensure that the participants properly and fully answer the questions. If not, you may ask probing questions to attempt to get more information. Make sure that when trying to get more information, you do not bias the participants in any way or lead them to answer in any way other than their own opinion. Such questions may include:*

- General Probes:**
  - *Could you please tell me more about...*
  - *I'm not quite sure I understood ...Could you tell me about that some more?*
  - *I'm not certain what you mean by... Could you give me some examples?*
  - *Could you tell me more about your thinking on that?*
  - *You mentioned.... Could you tell me more about that? What stands out in your mind about that?*
  - *This is what I thought I heard...Did I understand you correctly?*
  - *So what I hear you saying is..."*
  - *Can you give me an example of...*
  - *What makes you feel that way?*
  - *How does that effect your opinion?*
  - *What would you like to know about the technology? (e.g., screen, functionality)*
  - *Why do you see that as important?*

What do you think about this technology?

1. Do you think this technology useful?
  - a. **If yes, "Why?"**
  - b. **If no, "Why not?"**
2. Do you need this technology to assist you in (**fill in task of the technology**)?
3. Do you think this could be helpful for other people?
4. What are some of the benefits that would come from using this technology?
  - a. After talking about the benefits of using this technology, do you believe this technology would improve your health at all?
  - b. Can you imagine any negative outcomes or problems with using this device?
5. How easy do you believe it would be to use this technology?

6. Do you believe you would have to put forth any effort to use this technology? (e.g., time)
7. How familiar are you with this type of technology?
8. Do you **currently** use something similar to this technology? (i.e., method or device)
  - a. **If yes:** Can you describe it?
    - i. Is this a technology that you would currently use in place of your current method or device?
      1. Do you see this technology easier to use than (**fill in the method or device that they are currently using**)?
  - b. **If no, move on to the next question**
9. Do you believe you can easily incorporate this technology into your daily routine?
10. Would you trust this technology?
11. Do you believe this technology will get in the way of your privacy?

Now, we are going to change the topic to discuss a little about what others might think about this technology.

12. How would your healthcare provider feel about you using this technology?
13. How would your family feel about you using this technology?
14. How would your friends feel about you using this technology?
15. This technology is recommended by your healthcare provider, does this make you more likely to use it?
16. If a family member recommended you to use this technology, would this make you more likely to use it?
17. If a friend recommended you to use this technology, would this make you more likely to use it?
18. Some people may or may not need help using this technology. Would you be comfortable using this technology on your own?
  - a. **If yes:** Why would you be comfortable using this technology on your own?
  - b. **If no:** What would make you comfortable to use this technology on your own?

So now let's talk about the cost of the technology. Again, remember there are no right or wrong answers.

19. After reading the description, how much do you believe this technology will cost?
20. You said that you believe this technology cost (**insert amount they stated**). If you had to pay that amount out of pocket to buy this technology, would you use it?
  - a. **If yes:** Why would you buy this technology?
  - b. How about if your health insurance covered half of the cost, do you believe you would use this technology?
  - c. How about if we offered it to you to take home for free, would you use this technology?

I have just a few more questions.

21. How do you feel when you think of using this technology? What is your initial reaction?
24. Do you have any concerns about your ability to use this technology correctly?
25. On a scale of 1 to 10, 1 being not confident and 10 being very confident, how confident are you that you could use this technology correctly?
26. As we wrap up the questions for this technology, are there any suggestions you would give to improve this technology for you?
27. Do you have any other comments about this technology?

Let's go to the SECOND situation.

**Now:** Imagine you have multiple medications that you must manage at a time and your healthcare provider recommends that you use an electronic pillbox as the best way for you to organize them.

- Hand description of electronic pillbox.**
- If you have any questions about the functions or purpose of this technology as you read the description, feel free to ask me.

*Begin asking the following questions. Ensure that the participants properly and fully answer the questions. If not, you may ask probing questions to attempt to get more information. Make sure that when trying to get more information, you do not bias the participants in any way or lead them to answer in any way other than their own opinion. Such questions may include:*

- General Probes:**
  - o *Could you please tell me more about...*
  - o *I'm not quite sure I understood ...Could you tell me about that some more?*
  - o *I'm not certain what you mean by... Could you give me some examples?*
  - o *Could you tell me more about your thinking on that?*
  - o *You mentioned.... Could you tell me more about that? What stands out in your mind about that?*
  - o *This is what I thought I heard...Did I understand you correctly?*
  - o *So what I hear you saying is..."*
  - o *Can you give me an example of...*
  - o *What makes you feel that way?*
  - o *How does that effect your opinion?*
  - o *What would you like to know about the technology? (e.g., screen, functionality)*
  - o *Why do you see that as important?*

**What do you think about this technology?**

22. Do you think this technology useful?
  - a. If yes, "Why?"



- b. **If no**, “Why not?”
- 23. Do you need this technology to assist you in (*fill in task of the technology*)?
- 24. Do you think this could be helpful for other people?
- 25. What are some of the benefits that would come from using this technology?
  - c. After talking about the benefits of using this technology, do you believe this technology would improve your health at all?
  - d. Can you imagine any negative outcomes or problems with using this device?
- 26. How easy do you believe it would be to use this technology?
- 27. Do you believe you would have to put forth any effort to use this technology? (e.g., time)
- 28. How familiar are you with this type of technology?
- 29. Do you **currently** use something similar to this technology? (i.e., method or device)
  - a. **If yes**: Can you describe it?
    - i. Is this a technology that you would currently use in place of your current method or device?
      - 1. Do you see this technology easier to use than (*fill in the method or device that they are currently using*)?
  - b. **If no**, *move on to the next question*
- 30. Do you believe you can easily incorporate this technology into your daily routine?
- 31. Would you trust this technology?
- 32. Do you believe this technology will get in the way of your privacy?

Now, we are going to change the topic to discuss a little about what others might think about this technology.

- 33. How would your healthcare provider feel about you using this technology?
- 34. How would your family feel about you using this technology?
- 35. How would your friends feel about you using this technology?
- 36. This technology is recommended by your healthcare provider, does this make you more likely to use it?
- 37. If a family member recommended you to use this technology, would this make you more likely to use it?
- 38. If a friend recommended you to use this technology, would this make you more likely to use it?
- 39. Some people may or may not need help using this technology. Would you be comfortable using this technology on your own?
  - c. **If yes**: Why would you be comfortable using this technology on your own?
  - d. **If no**: What would make you comfortable to use this technology on your own?

So now let’s talk about the cost of the technology. Again, remember there are no right or wrong answers.

- 40. After reading the description, how much do you believe this technology will cost?

41. You said that you believe this technology cost **(insert amount they stated)**. If you had to pay that amount out of pocket to buy this technology, would you use it?
- d. **If yes:** Why would you buy this technology?
  - e. How about if your health insurance covered half of the cost, do you believe you would use this technology?
  - f. How about if we offered it to you to take home for free, would you use this technology?

I have just a few more questions.

- 42. How do you feel when you think of using this technology? What is your initial reaction?
- 28. Do you have any concerns about your ability to use this technology correctly?
- 29. On a scale of 1 to 10, 1 being not confident and 10 being very confident, how confident are you that you could use this technology correctly?
- 30. As we wrap up the questions for this technology, are there any suggestions you would give to improve this technology for you?
- 31. Do you have any other comments about this technology?

Let's move on to the LAST situation.

*Now:* Imagine that you were newly diagnosed with a condition that affects your fine motor skills (i.e., Stroke). Your healthcare provider recommends a multifunctional robot to help you check your blood pressure and to bring you your medication.

- Hand description of multifunctional health robot.**
- If you have any questions about the functions or purpose of this technology as you read the description, feel free to ask me.

*Begin asking the following questions. Ensure that the participants properly and fully answer the questions. If not, you may ask probing questions to attempt to get more information. Make sure that when trying to get more information, you do not bias the participants in any way or lead them to answer in any way other than their own opinion. Such questions may include:*

- General Probes:**
  - o *Could you please tell me more about...*
  - o *I'm not quite sure I understood ... Could you tell me about that some more?*
  - o *I'm not certain what you mean by... Could you give me some examples?*
  - o *Could you tell me more about your thinking on that?*
  - o *You mentioned... Could you tell me more about that? What stands out in your mind about that?*
  - o *This is what I thought I heard... Did I understand you correctly?*
  - o *So what I hear you saying is..."*
  - o *Can you give me an example of...*

- *What makes you feel that way?*
- *How does that effect your opinion?*
- *What would you like to know about the technology? (e.g.,*
- *screen, functionality)*
- *Why do you see that as important?*

What do you think about this technology?

43. Do you think this technology useful?
  - a. **If yes, “Why?”**
  - b. **If no, “Why not?”**
44. Do you need this technology to assist you in (**fill in task of the technology**)?
45. Do you think this could be helpful for other people?
46. What are some of the benefits that would come from using this technology?
  - e. After talking about the benefits of using this technology, do you believe this technology would improve your health at all?
  - f. Can you imagine any negative outcomes or problems with using this device?
47. How easy do you believe it would be to use this technology?
48. Do you believe you would have to put forth any effort to use this technology? (e.g., time)
49. How familiar are you with this type of technology?
50. Do you **currently** use something similar to this technology? (i.e., method or device)
  - a. **If yes:** Can you describe it?
    - i. Is this a technology that you would currently use in place of your current method or device?
      1. Do you see this technology easier to use than (**fill in the method or device that they are currently using**)?
  - b. **If no, move on to the next question**
51. Do you believe you can easily incorporate this technology into your daily routine?
52. Would you trust this technology?
53. Do you believe this technology will get in the way of your privacy?

Now, we are going to change the topic to discuss a little about what others might think about this technology.

54. How would your healthcare provider feel about you using this technology?
55. How would your family feel about you using this technology?
56. How would your friends feel about you using this technology?
57. This technology is recommended by your healthcare provider, does this make you more likely to use it?
58. If a family member recommended you to use this technology, would this make you more likely to use it?
59. If a friend recommended you to use this technology, would this make you more likely to use it?
60. Some people may or may not need help using this technology. Would you be

comfortable using this technology on your own?

- e. **If yes:** Why would you be comfortable using this technology on your own?
- f. **If no:** What would make you comfortable to use this technology on your own?

So now let's talk about the cost of the technology. Again, remember there are no right or wrong answers.

- 61. After reading the description, how much do you believe this technology will cost?
- 62. You said that you believe this technology cost (**insert amount they stated**). If you had to pay that amount out of pocket to buy this technology, would you use it?
  - g. **If yes:** Why would you buy this technology?
  - h. How about if your health insurance covered half of the cost, do you believe you would use this technology?
  - i. How about if we offered it to you to take home for free, would you use this technology?

I have just a few more questions.

- 63. How do you feel when you think of using this technology? What is your initial reaction?
- 32. Do you have any concerns about your ability to use this technology correctly?
- 33. On a scale of 1 to 10, 1 being not confident and 10 being very confident, how confident are you that you could use this technology correctly?
- 34. As we wrap up the questions for this technology, are there any suggestions you would give to improve this technology for you?
- 35. Do you have any other comments about this technology?

**Ask at the very end of the interview:** We are almost done with part 2 of this study! I want you think of everything that we have talked about today and anything else that we may have not spoken about during our conversation. If you could only choose one of these technologies, which one would you choose and why?

Do you have any other comments or anything else that you would like to share?

I am now going to stop the recorder.

*<Stop recorder>*

### **Break**

Great!! That concludes part 2 of our session today. Would you like to take a 5-minute break?

- If yes, give the participant a 5-minute break.*
- If no, continue to Part III.*

### **Part III**

- During this portion of our study, you will complete two different questionnaires. First I am going to ask you to fill out this demographic questionnaire. It will ask about your basic background information such as age, gender, etc. You will find the instructions on the second page.
  - Give participants the demographic questionnaire
  - Collect questionnaire when they finish
- The last questionnaire is called the multidimensional health locus of control. The instructions are on top of the page. Please read it carefully before you start. If you need help reading it at all, please let me know.
  - Give participants the MHLC Form C
  - Collect questionnaire when they finish

### **Conclusion**

You have completed all three parts of this study. Thank you for your time and being a part of our study. I will send you your compensation via email. This is a debriefing form to review what you did in our study and why we are conducting this research. Have a great day!

- Give participant the debriefing form.

## Understanding Older Adults' Intentions to Use Healthcare Technologies

### Phone Interview Script

*Italics = items or reminders (not to be said to the participants)*

**Red** = actions (not to be said to the participants)

#### **General Introduction**

Thank you for participating in this study. Before we get started, I would like you to please turn off your cell phone, so we do not have any interruptions. Thank you.

My name is \_\_\_\_\_ and I will be assisting with today's interview. The study consists of three parts and the total estimated duration of the study is 1 hour and 30 minutes.

- Part I includes the two questionnaires that we sent to you and you successfully completed.
- Part II involves the interview and will take about 45 minutes. Three descriptions of three different types of healthcare technologies will be presented to you separately. First, I will read the description with you following along and then you will have time to review the descriptions that were sent to you at your leisure. Following that, we will talk about whether you intend to use it and why.
- Part III includes another set of questionnaires that will be sent to you following our conversation.

I am now going to start the recorder. Ok?

*<Turn on recorder>*

**If Participants did not send in the consent form.**

Were you able to review the consent form that was sent to you?

- **If yes**, Do you have any questions or concerns that you would like to go over?
- **If no**, I will read over the consent form at this time. If you have any questions, feel free to ask at any moment.
  - **Once done**, Do you have any questions?
    - **If yes, answer**
    - **If no**, Do you consent to be in this study?

**If participants sent in their consent form:**

Do you have any questions about the study before we start?

- **If yes, answer**
- **If no, continue**

Let's begin our conversation.

## **Part II**

### **Icebreaker:**

Let's start by talking about your experience with healthcare technology. Healthcare technology allows the individual to manage aspects of their health, such as, medication management, medical appointments, health records, exercise, and nutrition.

1. What was the last healthcare technology that you used and what did you use it for?

For this interview, one thing that we are interested in is understanding how you decide whether or not use a healthcare technology.

Before we start, I would like to go over some guidelines for this conversation.

### **Guidelines:**

- First, in order to be consistent between participants, I am required to read directly from this script. Questions may sound formal or repetitive and that is okay. It is also okay if your answers seem repetitive.
- I am interested in capturing your current and personal experiences. So say whatever ideas and opinions that comes to your mind first. If there is anything that you do not wish to discuss, we can always skip that question. Please just let me know.
- Your responses are completely confidential.
- There are no right or wrong answers, so please feel free to express your opinion, to the best of your ability.

If you would like to take a restroom break during our conversation, let me know and I will pause the recorder.

We will first start with a situation for you to imagine. Then I will give you the description of the technology. I will first read the description while you follow along and then you will have time to read over it by yourself and ask any questions that you may have.

**Situation:** Imagine you have high blood pressure and your healthcare provider recommends that you begin to monitor your blood pressure two times every day.

- Hand description of blood pressure monitor.**
- If you have any questions about the functions or purpose of this technology as you read the description, feel free to ask me.

*Begin asking the following questions. Ensure that the participants properly and fully answer the questions. If not, you may ask probing questions to attempt to get more information. Make sure that when trying to get more information, you do not bias the participants in any way or lead them to answer in any way other than their own opinion. Such questions may include:*

□ *General Probes:*

- *Could you please tell me more about...*
- *I'm not quite sure I understood ...Could you tell me about that some more?*
- *I'm not certain what you mean by... Could you give me some examples?*
- *Could you tell me more about your thinking on that?*
- *You mentioned... Could you tell me more about that? What stands out in your mind about that?*
- *This is what I thought I heard...Did I understand you correctly?*
- *So what I hear you saying is... ”*
- *Can you give me an example of...*
- *What makes you feel that way?*
- *How does that effect your opinion?*
- *What would you like to know about the technology? (e.g., screen, functionality)*
- *Why do you see that as important?*

What do you think about this technology?

1. Do you think this technology useful?
  - a. **If yes**, “Why?”
  - b. **If no**, “Why not?”
2. Do you need this technology to assist you in (**fill in task of the technology**)?
3. Do you think this could be helpful for other people?
4. What are some of the benefits that would come from using this technology?
  - a. After talking about the benefits of using this technology, do you believe this technology would improve your health at all?
  - b. Can you imagine any negative outcomes or problems with using this device?
5. How easy do you believe it would be to use this technology?
6. Do you believe you would have to put forth any effort to use this technology? (e.g., time)
7. How familiar are you with this type of technology?
8. Do you **currently** use something similar to this technology? (i.e., method or device)
  - a. **If yes:** Can you describe it?
    - i. Is this a technology that you would currently use in place of your current method or device?
      1. Do you see this technology easier to use than (**fill in the method or device that they are currently using**)?
  - b. **If no, move on to the next question**
9. Do you believe you can easily incorporate this technology into your daily routine?
10. Would you trust this technology?
11. Do you believe this technology will get in the way of your privacy?



Now, we are going to change the topic to discuss a little about what others might think about this technology.

12. How would your healthcare provider feel about you using this technology?
13. How would your family feel about you using this technology?
14. How would your friends feel about you using this technology?
15. This technology is recommended by your healthcare provider, does this make you more likely to use it?
16. If a family member recommended you to use this technology, would this make you more likely to use it?
17. If a friend recommended you to use this technology, would this make you more likely to use it?
18. Some people may or may not need help using this technology. Would you be comfortable using this technology on your own?
  - a. **If yes:** Why would you be comfortable using this technology on your own?
  - b. **If no:** What would make you comfortable to use this technology on your own?

So now let's talk about the cost of the technology. Again, remember there are no right or wrong answers.

19. After reading the description, how much do you believe this technology will cost?
20. You said that you believe this technology cost (**insert amount they stated**). If you had to pay that amount out of pocket to buy this technology, would you use it?
  - a. **If yes:** Why would you buy this technology?
  - b. How about if your health insurance covered half of the cost, do you believe you would use this technology?
  - c. How about if we offered it to you to take home for free, would you use this technology?

I have just a few more questions.

21. How do you feel when you think of using this technology? What is your initial reaction?
24. Do you have any concerns about your ability to use this technology correctly?
25. On a scale of 1 to 10, 1 being not confident and 10 being very confident, how confident are you that you could use this technology correctly?
26. As we wrap up the questions for this technology, are there any suggestions you would give to improve this technology for you?
27. Do you have any other comments about this technology?

Let's go to the SECOND situation.

**Now:** Imagine you have multiple medications that you must manage at a time and your healthcare provider recommends that you use an electronic pillbox as the best way for you to organize them.

- Hand description of electronic pillbox.**

- If you have any questions about the functions or purpose of this technology as you read the description, feel free to ask me.

*Begin asking the following questions. Ensure that the participants properly and fully answer the questions. If not, you may ask probing questions to attempt to get more information. Make sure that when trying to get more information, you do not bias the participants in any way or lead them to answer in any way other than their own opinion. Such questions may include:*

- **General Probes:**
  - *Could you please tell me more about...*
  - *I'm not quite sure I understood ...Could you tell me about that some more?*
  - *I'm not certain what you mean by... Could you give me some examples?*
  - *Could you tell me more about your thinking on that?*
  - *You mentioned.... Could you tell me more about that? What stands out in your mind about that?*
  - *This is what I thought I heard...Did I understand you correctly?*
  - *So what I hear you saying is..."*
  - *Can you give me an example of...*
  - *What makes you feel that way?*
  - *How does that effect your opinion?*
  - *What would you like to know about the technology? (e.g., screen, functionality)*
  - *Why do you see that as important?*

**What do you think about this technology?**

22. Do you think this technology useful?
  - a. **If yes**, "Why?"
  - b. **If no**, "Why not?"
23. Do you need this technology to assist you in (*fill in task of the technology*)?
24. Do you think this could be helpful for other people?
25. What are some of the benefits that would come from using this technology?
  - c. After talking about the benefits of using this technology, do you believe this technology would improve your health at all?
  - d. Can you imagine any negative outcomes or problems with using this device?
26. How easy do you believe it would be to use this technology?
27. Do you believe you would have to put forth any effort to use this technology? (e.g., time)
28. How familiar are you with this type of technology?
29. Do you **currently** use something similar to this technology? (i.e., method or device)
  - a. **If yes**: Can you describe it?

- i. Is this a technology that you would currently use in place of your current method or device?
  - 1. Do you see this technology easier to use than (*fill in the method or device that they are currently using*)?
- b. *If no, move on to the next question*
- 30. Do you believe you can easily incorporate this technology into your daily routine?
- 31. Would you trust this technology?
- 32. Do you believe this technology will get in the way of your privacy?

Now, we are going to change the topic to discuss a little about what others might think about this technology.

- 33. How would your healthcare provider feel about you using this technology?
- 34. How would your family feel about you using this technology?
- 35. How would your friends feel about you using this technology?
- 36. This technology is recommended by your healthcare provider, does this make you more likely to use it?
- 37. If a family member recommended you to use this technology, would this make you more likely to use it?
- 38. If a friend recommended you to use this technology, would this make you more likely to use it?
- 39. Some people may or may not need help using this technology. Would you be comfortable using this technology on your own?
  - c. *If yes:* Why would you be comfortable using this technology on your own?
  - d. *If no:* What would make you comfortable to use this technology on your own?

So now let's talk about the cost of the technology. Again, remember there are no right or wrong answers.

- 40. After reading the description, how much do you believe this technology will cost?
- 41. You said that you believe this technology cost (*insert amount they stated*). If you had to pay that amount out of pocket to buy this technology, would you use it?
  - d. *If yes:* Why would you buy this technology?
  - e. How about if your health insurance covered half of the cost, do you believe you would use this technology?
  - f. How about if we offered it to you to take home for free, would you use this technology?

I have just a few more questions.

- 42. How do you feel when you think of using this technology? What is your initial reaction?
- 28. Do you have any concerns about your ability to use this technology correctly?
- 29. On a scale of 1 to 10, 1 being not confident and 10 being very confident, how confident are you that you could use this technology correctly?

30. As we wrap up the questions for this technology, are there any suggestions you would give to improve this technology for you?
31. Do you have any other comments about this technology?

Let's move on to the LAST situation.

**Now:** Imagine that you were newly diagnosed with a condition that affects your fine motor skills (i.e., Stroke). Your healthcare provider recommends a multifunctional robot to help you check your blood pressure and to bring you your medication.

- Hand description of multifunctional health robot.**
- If you have any questions about the functions or purpose of this technology as you read the description, feel free to ask me.

*Begin asking the following questions. Ensure that the participants properly and fully answer the questions. If not, you may ask probing questions to attempt to get more information. Make sure that when trying to get more information, you do not bias the participants in any way or lead them to answer in any way other than their own opinion. Such questions may include:*

- General Probes:**
  - *Could you please tell me more about...*
  - *I'm not quite sure I understood ...Could you tell me about that some more?*
  - *I'm not certain what you mean by... Could you give me some examples?*
  - *Could you tell me more about your thinking on that?*
  - *You mentioned.... Could you tell me more about that? What stands out in your mind about that?*
  - *This is what I thought I heard...Did I understand you correctly?*
  - *So what I hear you saying is..."*
  - *Can you give me an example of...*
  - *What makes you feel that way?*
  - *How does that effect your opinion?*
  - *What would you like to know about the technology? (e.g., screen, functionality)*
  - *Why do you see that as important?*

What do you think about this technology?

43. Do you think this technology useful?
- a. **If yes, "Why?"**
  - b. **If no, "Why not?"**
44. Do you need this technology to assist you in (**fill in task of the technology**)?
45. Do you think this could be helpful for other people?
46. What are some of the benefits that would come from using this technology?
- e. After talking about the benefits of using this technology, do you believe this technology would improve your health at all?

- f. Can you imagine any negative outcomes or problems with using this device?
- 47. How easy do you believe it would be to use this technology?
- 48. Do you believe you would have to put forth any effort to use this technology? (e.g., time)
- 49. How familiar are you with this type of technology?
- 50. Do you **currently** use something similar to this technology? (i.e., method or device)
  - a. **If yes:** Can you describe it?
    - i. Is this a technology that you would currently use in place of your current method or device?
      - 1. Do you see this technology easier to use than (**fill in the method or device that they are currently using**)?
  - b. **If no, move on to the next question**
- 51. Do you believe you can easily incorporate this technology into your daily routine?
- 52. Would you trust this technology?
- 53. Do you believe this technology will get in the way of your privacy?

Now, we are going to change the topic to discuss a little about what others might think about this technology.

- 54. How would your healthcare provider feel about you using this technology?
- 55. How would your family feel about you using this technology?
- 56. How would your friends feel about you using this technology?
- 57. This technology is recommended by your healthcare provider, does this make you more likely to use it?
- 58. If a family member recommended you to use this technology, would this make you more likely to use it?
- 59. If a friend recommended you to use this technology, would this make you more likely to use it?
- 60. Some people may or may not need help using this technology. Would you be comfortable using this technology on your own?
  - c. **If yes:** Why would you be comfortable using this technology on your own?
  - f. **If no:** What would make you comfortable to use this technology on your own?

So now let's talk about the cost of the technology. Again, remember there are no right or wrong answers.

- 61. After reading the description, how much do you believe this technology will cost?
- 62. You said that you believe this technology cost (**insert amount they stated**). If you had to pay that amount out of pocket to buy this technology, would you use it?
  - g. **If yes:** Why would you buy this technology?
  - h. How about if your health insurance covered half of the cost, do you believe you would use this technology?

- i. How about if we offered it to you to take home for free, would you use this technology?

I have just a few more questions.

63. How do you feel when you think of using this technology? What is your initial reaction?
32. Do you have any concerns about your ability to use this technology correctly?
33. On a scale of 1 to 10, 1 being not confident and 10 being very confident, how confident are you that you could use this technology correctly?
34. As we wrap up the questions for this technology, are there any suggestions you would give to improve this technology for you?
35. Do you have any other comments about this technology?

***Ask at the very end of the interview:*** We are almost done with part 2 of this study! I want you think of everything that we have talked about today and anything else that we may have not spoken about during our conversation. If you could only choose one of these technologies, which one would you choose and why?

Do you have any other comments or anything else that you would like to share?

I am now going to stop the recorder.

*<Stop recorder>*

### **Break**

Great!! That concludes part 2 of our session today. You will be receiving the last two questionnaires to complete similarly to how you received the first two. Once both are completed, I will send you your compensation and debriefing form. Thank you for your time and being a part of our study. Have a great day!

# Technology Readiness Index

Please indicate how much you agree with the following statements by circling your answer.

- 1 Strongly disagree
- 2 Somewhat disagree
- 3 Neutral
- 4 Somewhat agree
- 5 Strongly agree

## 1. Technology gives me more freedom of mobility

1	2	3	4	5
Strongly Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Strongly Agree

## 2. Technology gives people more control over their daily lives

1	2	3	4	5
Strongly Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Strongly Agree

## 3. Other people come to me for advice on new technologies

1	2	3	4	5
Strongly Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Strongly Agree

## 4. In general, I am among the first in my circle of friends to acquire new technology when it appears

1	2	3	4	5
Strongly Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Strongly Agree

**5. I keep up with the latest technological developments in my areas of interest**

1	2	3	4	5
Strongly Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Strongly Agree

**6. Technical support lines are not helpful because they don't explain things in terms I understand**

1	2	3	4	5
Strongly Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Strongly Agree

**7. Sometimes, I think that technology systems are not designed for use by ordinary people**

1	2	3	4	5
Strongly Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Strongly Agree

**8. People are too dependent on technology to do things for them**

1	2	3	4	5
Strongly Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Strongly Agree

**9. Too much technology distracts people to a point that is harmful**

1	2	3	4	5
Strongly Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Strongly Agree

**10. Technology lowers the quality of relationships by reducing personal interaction**

1	2	3	4	5
Strongly Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Strongly Agree



## Technology Experience Profile

The purpose of this set of questions is to assess your familiarity and experience with technology.

The following pages list technologies from different areas.

Please circle the most appropriate response to indicate how much you have used the technology listed, within the last 12 months.

Please turn to the back of this page to begin.

**Within the last 12 months, how much you have used...?**

<b><i>Communication Technology</i></b>	Not sure what it is	Not used	Used once	Used occasionally	Used frequently
1. Answering Machine/ Voicemail (e.g., record and retrieve messages) *with or without video relay service	1	2	3	4	5
2. Automated Telephone Menu System (e.g., pay bills, refill prescriptions) *with or without video relay service	1	2	3	4	5
3. Fax (e.g., receive and send printed documents)	1	2	3	4	5
4. Mobile Phone (e.g., make and receive calls) *with or without video relay service	1	2	3	4	5
5. Text Messaging (e.g., phone texting, BBM, iMessage, SMS)	1	2	3	4	5
6. Video call/conferencing (e.g., Skype, Facetime)	1	2	3	4	5

**Within the last 12 months, how much you have used...?**

<b><i>Computer Technology</i></b>	Not sure what it is	Not used	Used once	Used occasionally	Used frequently
7. Desktop/Laptop Computer	1	2	3	4	5
8. Tablet Computer (e.g., iPad, Surface)	1	2	3	4	5
9. Email (e.g., Gmail, Yahoo)	1	2	3	4	5
10. Photo/Video Software (e.g., editing, organizing; iPhoto, Picture Manager, Photoshop)	1	2	3	4	5
11. Productivity Software (e.g., Excel, PowerPoint, Quicken, TurboTax, Word)	1	2	3	4	5
12. Social Networking (e.g., Facebook, MySpace)	1	2	3	4	5

<b>Within the last 12 months, how much you have used...?</b>					
<b><i>Everyday Technology</i></b>	Not sure what it is	Not used	Used once	Used occasionally	Used frequently
13. Automatic Teller Machine (ATM)	1	2	3	4	5
14. Photocopier (e.g., Lexmark, Xerox)	1	2	3	4	5
15. Home Security System (e.g., Ackerman Security, ADT)	1	2	3	4	5
16. In-Store Kiosk (e.g., grocery self-checkout, price checker)	1	2	3	4	5
17. Microwave Oven	1	2	3	4	5
18. Programmable Device (e.g., coffee maker, thermostat)	1	2	3	4	5
<b>Within the last 12 months, how much you have used...?</b>					
<b><i>Health Technology</i></b>	Not sure what it is	Not used	Used once	Used occasionally	Used frequently
19. Blood Pressure Monitor (e.g., measure blood pressure)	1	2	3	4	5
20. Digital Thermometer (e.g., measure temperature)	1	2	3	4	5
21. Health Management Software (e.g., to keep track of weight, diet, exercise; Personal Health Record)	1	2	3	4	5
22. Heart Rate Monitor (e.g., measure heart rate, pulse)	1	2	3	4	5
23. Medication Reminder Device (e.g., schedule electronic alerts)	1	2	3	4	5
24. Pedometer (e.g., measure walking distance)	1	2	3	4	5

<b>Within the last 12 months, how much you have used...?</b>					
<b><i>Recreational Technology</i></b>	Not sure what it is	Not used	Used once	Used occasionally	Used frequently
25. Digital Music Player (e.g., iPod, MP3 player, Zune, tablet)	1	2	3	4	5
26. Digital Photography (e.g., camera, tablet, phone)	1	2	3	4	5
27. Electronic Book Reader (e.g., Kindle, Nook, tablet)	1	2	3	4	5
28. Gaming Console (e.g., Playstation, Wii, Xbox)	1	2	3	4	5
29. Online Shopping/Coupons (e.g., Amazon, Groupon, retail stores)	1	2	3	4	5
30. Recording and Playback Device (e.g., Blu-Ray, CD, DVD, DVR, VCR)	1	2	3	4	5

<b>Within the last 12 months, how much you have used...?</b>					
<b><i>Transportation Technology</i></b>	Not sure what it is	Not used	Used once	Used occasionally	Used frequently
31. Airline Kiosk (e.g., check in, print boarding pass)	1	2	3	4	5
32. Bus Tracker (e.g., check location of buses, estimate time of arrival)	1	2	3	4	5
33. Online Map Software (e.g., get directions, plan routes; Google Maps, MapQuest)	1	2	3	4	5
34. In-Vehicle Navigation System/GPS	1	2	3	4	5
35. Online Travel Reservation (e.g., airline website, Expedia, Travelocity)	1	2	3	4	5
36. Parking Payment System (e.g., exiting lot, paying for space)	1	2	3	4	5

## **Blood Pressure Monitor**

This healthcare technology is a convenient, portable unit that allows you to monitor your blood pressure at home, work, or anywhere. This technology is composed of a monitor and a cuff. You will need to perform the following steps to properly use this healthcare technology:

1. Plug the monitor into an electrical outlet or load 4 AA batteries into the monitor.
2. Insert the air plug of the cuff into the air jack of the monitor securely.
3. Put the cuff on your upper arm with the middle of the cuff placed directly above the bend of the elbow. Place that same arm on a flat surface with your upper arm at heart level. Sit with your back straight and your feet on the floor with your legs uncrossed.
4. Press the START/STOP button and hold still.

Once the correct position is reached, the cuff will inflate automatically until your blood pressure is measured. Then the cuff will deflate and the results are displayed on the monitor. Be sure to remove the arm cuff and press the START/STOP button to turn the monitor off when you are finished. The monitor will automatically store the measurement result in its memory and will automatically turn off after 2 minutes.

## **Electronic Pillbox**

This healthcare technology conveniently reminds you to take your medication. The kit contains a hub, a weekly pill organizer, and scanning tags (e.g., stickers). The hub has a large and easy to read screen, buttons to scroll, a clock, and it reminds you when to take your medication at a pre-set time using light and sound. You have the option of using the weekly pill organizer and/or tags that you can place on your pill bottles. You can also use the optional app to create and edit medication schedules, get reminders on the go, receive adherence updates, and log doses. You will need to complete the following steps to properly use this healthcare technology:

1. Plug the hub into an electrical outlet.
2. Organize your medications via the weekly pill organizer and/or place tags on the top of your pill bottles.
3. Scan the weekly pill organizer or pill bottles with tags on them separately across the hub setting the time that you would like to be notified to take each medication.
4. Optional: Connect the hub to Wi-Fi and download the app from the Google Play Store, the Apple iTunes Store, or use the website.

Once the preset time is reached, scan the weekly pill organizer or the pill bottles with tags on them across the hub to log each dose taken.

## **Multifunctional Healthcare Robot**

This healthcare technology has two functions: to monitor your blood pressure and to bring your medication at a preset time. You can conveniently command the robot by talking to it. The robot has two arms, a touch screen monitor, and a removable pillbox tray. The Multifunctional Healthcare Robot can check your blood pressure by using a cuff and the touch screen monitor. It also can bring you the medication that you inserted into the circular pillbox tray. When the robot receives no commands, it will return to its charging station. You will need to perform the following steps to properly use this healthcare technology:

### **General setup:**

1. Charge the robot by plugging in into an electrical outlet.

### **Instructions to take blood pressure:**

1. Tell the robot, "Time to take my blood pressure" when you are seated and ready.
2. Sit with your back straight and your feet on the floor with your legs uncrossed.
3. Place your arm on a flat surface with your upper arm at heart level.
4. Hold still, while the robot places the wireless cuff on your upper arm with the middle of the cuff placed directly above the bend of the elbow.

Once the correct position is reached, the cuff will inflate automatically until your blood pressure is measured. Then

the cuff will deflate. The robot will state the results and show them on the touch screen monitor, as well as store the results for later review.

**Instructions for medication reminder and pill dispensing:**

1. Remove the circular pillbox tray under the touch screen monitor to place your pills. There are 10 numbered compartments that will hold up to 25 medium sized pills.
2. Insert the pills that you would like to go in each compartment.
3. Once completed, place the circular pillbox tray back into the robot.
4. Use the touch screen to enter the name of the medication, dose per day, and to set the time that you would like to be notified to take each medication using the touch screen monitor.

When the preset time is reached, the robot will automatically dispense the medication into a cup and bring it to you. If a compartment becomes low, this robot will notify you and can order a refill with your permission.



# BACKGROUND QUESTIONNAIRE



For HFA Personnel Use Only DATE: \_\_\_ / \_\_\_ / \_\_\_

SUBJECT ID: \_\_\_\_\_ - \_\_\_\_\_ - \_\_\_\_\_ - \_\_\_\_\_

Data Entered By:	DATE
1 <sup>st</sup> _____	___ / ___ / ___
2 <sup>nd</sup> _____	___ / ___ / ___

Consent given to include data in archived repository

**Thank you for participating on our research!**

**This questionnaire asks you to provide information about various aspects of your background, including your demographic and health information. Please answer the questions by placing an X in the appropriate box.**

**Published documents regarding these answers will not identify individuals with their answers. However, if there is a question that you do not wish to answer, please leave it blank and go on to the next question.**

### **Demographic Information**

1. Gender:        <sub>1</sub> Male    <sub>2</sub> Female
  
2. What is your date of birth? \_\_\_\_\_ (mm/dd/yyyy)
  
3. Are you fluent in English?        <sub>1</sub> Yes    <sub>2</sub> No
  
4. What is your preferred language for communicating?
  - <sub>1</sub> English
  - <sub>2</sub> Spanish
  - <sub>3</sub> American Sign Language
  - <sub>4</sub> Other (please list)\_\_\_\_\_
  
5. What is your highest level of education?
  - <sub>1</sub> No formal education
  - <sub>2</sub> Less than high school graduate
  - <sub>3</sub> High school graduate/GED
  - <sub>4</sub> Vocational training
  - <sub>5</sub> Some or in-progress college/Associate's degree
  - <sub>6</sub> Bachelor's degree (BA, BS)
  - <sub>7</sub> Master's degree (or other post-graduate training)
  - <sub>8</sub> Doctoral degree (PhD, MD, EdD, DDS, JD, etc)
  - <sub>9</sub> Do not wish to answer
  
6. Current marital status (Check **one**)
  - <sub>1</sub> Single
  - <sub>2</sub> Married
  - <sub>3</sub> Separated
  - <sub>4</sub> Divorced
  - <sub>5</sub> Widowed
  - <sub>6</sub> Other (please specify) \_\_\_\_\_
  - <sub>7</sub> Do not wish to answer
  
7. Do you consider yourself Hispanic or Latino?
  - <sub>1</sub> Yes
  - <sub>2</sub> No
  - <sub>3</sub> Do not wish to answer

8. How would you describe your primary racial group?

- <sub>1</sub> American Indian/Alaska Native
- <sub>2</sub> Asian
- <sub>3</sub> Black or African American
- <sub>4</sub> Native Hawaiian or Other Pacific Islander
- <sub>5</sub> White
- <sub>6</sub> More than one race
- <sub>7</sub> Other (please specify) \_\_\_\_\_
- <sub>8</sub> Do not wish to answer

9. In which type of housing do you live?

- <sub>1</sub> Single family home
- <sub>2</sub> Apartment or Condominium
- <sub>3</sub> Assisted living residence
- <sub>4</sub> Nursing home residence
- <sub>5</sub> Other (please specify) \_\_\_\_\_
- <sub>6</sub> Do not wish to answer

10. Which one of the following BEST describes your living arrangement?

- <sub>1</sub> Living alone
- <sub>2</sub> Living with your immediate family (i.e., spouse/partner and/or dependent children, or parents if never married)
- <sub>3</sub> Living with your adult children
- <sub>4</sub> Living with your (or your spouse/partner's) extended family (e.g., parents, siblings, cousins)
- <sub>5</sub> Living with roommate(s)
- <sub>6</sub> Other (please specify) \_\_\_\_\_
- <sub>7</sub> Do not wish to answer

11. Is your housing or community specifically designed for seniors (i.e., 55 and older)?

- <sub>1</sub> Yes            <sub>2</sub> No            <sub>3</sub> Not sure

12. What is your primary mode of transportation? (Check **one**)

- <sub>1</sub> Drive myself
- <sub>2</sub> A friend or family member drives me
- <sub>3</sub> Walk
- <sub>4</sub> Bicycle
- <sub>5</sub> Taxi
- <sub>6</sub> Use transportation service provided by my residence
- <sub>7</sub> Use public transportation (e.g., bus, subway, van services)
- <sub>8</sub> Other (please specify) \_\_\_\_\_

13. Which category best describes your yearly household income? Do not give the dollar amount, just check the category.

- <sub>1</sub> Less than \$25,000
- <sub>2</sub> \$25,000 - \$49,999
- <sub>3</sub> \$50,000 - \$74,999
- <sub>4</sub> \$75,000 or more
- <sub>5</sub> Do not wish to answer
- <sub>6</sub> Do not know for certain

#### **Occupational Status**

14. What is your primary occupational status? (Check **one**)

- <sub>1</sub> Employed full-time      Occupation? \_\_\_\_\_
- <sub>2</sub> Employed part-time      Occupation? \_\_\_\_\_
- <sub>3</sub> Student
- <sub>4</sub> Homemaker
- <sub>5</sub> Retired      Former occupation? \_\_\_\_\_      Year retired? \_\_\_\_\_
- <sub>6</sub> On maternity leave, on sick leave, or on disability benefits
- <sub>7</sub> Unemployed or temporarily laid off
- <sub>8</sub> Other (please specify) \_\_\_\_\_

## Health Information

1. In general, would you say your health is:

<input type="checkbox"/> <sub>1</sub>	<input type="checkbox"/> <sub>2</sub>	<input type="checkbox"/> <sub>3</sub>	<input type="checkbox"/> <sub>4</sub>	<input type="checkbox"/> <sub>5</sub>
Poor	Fair	Good	Very good	Excellent

2. Compared to other people your own age, would you say your health is:

<input type="checkbox"/> <sub>1</sub>	<input type="checkbox"/> <sub>2</sub>	<input type="checkbox"/> <sub>3</sub>	<input type="checkbox"/> <sub>4</sub>	<input type="checkbox"/> <sub>5</sub>
Poor	Fair	Good	Very good	Excellent

3. How satisfied are you with your present health?

<input type="checkbox"/> <sub>1</sub>	<input type="checkbox"/> <sub>2</sub>	<input type="checkbox"/> <sub>3</sub>	<input type="checkbox"/> <sub>4</sub>	<input type="checkbox"/> <sub>5</sub>
Not at all satisfied	Not very satisfied	Neither satisfied nor dissatisfied	Somewhat satisfied	Extremely satisfied

4. How often do health problems stand in the way of your doing the things you want to do?

<input type="checkbox"/> <sub>1</sub>	<input type="checkbox"/> <sub>2</sub>	<input type="checkbox"/> <sub>3</sub>	<input type="checkbox"/> <sub>4</sub>	<input type="checkbox"/> <sub>5</sub>
Never	Seldom	Sometimes	Often	Always

5. How much of the time has your health condition interfered with your social activities (like visiting with friends, relatives, etc.)?

<input type="checkbox"/> <sub>1</sub>	<input type="checkbox"/> <sub>2</sub>	<input type="checkbox"/> <sub>3</sub>	<input type="checkbox"/> <sub>4</sub>	<input type="checkbox"/> <sub>5</sub>
Never	Seldom	Sometimes	Often	Always

6. How many different **prescription medications** do you take each day?

\_\_\_\_\_

7. How many different **over-the-counter medications/supplements** do you take each day?

\_\_\_\_\_

8. Please indicate if you have ever been told by a health professional that you have any of the following conditions. Check **one** box for each condition.

<b>Condition</b>	<b>Yes<sub>1</sub></b>	<b>No<sub>2</sub></b>	<b>Do not wish to answer/ Not sure<sub>3</sub></b>
a. Alzheimer's Disease			
b. Arthritis			
c. Asthma			
d. Cancer			
e. Cardiac Atrial Fibrillation/ Cardiac Arrhythmia			
f. Chronic Kidney Disease			
g. Chronic Obstructive Pulmonary Disease (COPD)			
h. Coronary Artery Disease/ Coronary Heart Disease			
i. Depression			
j. Diabetes/High Blood Sugar			
k. Heart Failure/ Congestive Heart Failure			
l. High Blood Pressure/Hypertension			
m. High Cholesterol/Hyperlipidemia			
n. Osteoporosis			
o. Overweight			
p. Stroke/Transient Ischemic Attack			
q. Other? (If yes, please list below)  _____			
_____			

# Form C

---

Instructions: Each item below is a belief statement about your medical condition with which you may agree or disagree. Beside each statement is a scale which ranges from strongly disagree (1) to strongly agree (6). For each item we would like you to circle the number that represents the extent to which you agree or disagree with that statement. The more you agree with a statement, the higher will be the number you circle. The more you disagree with a statement, the lower will be the number you circle. Please make sure that you answer EVERY ITEM and that you circle ONLY ONE number per item. This is a measure of your personal beliefs; obviously, there are no right or wrong answers.

---

1=STRONGLY DISAGREE (SD)	4=SLIGHTLY AGREE (A)
2=MODERATELY DISAGREE (MD)	5=MODERATELY AGREE (MA)
3=SLIGHTLY DISAGREE (D)	6=STRONGLY AGREE (SA)

---

Number	Question	SD	MD	D	A	MA	SA
1	If my condition worsens, it is my own behavior which determines how soon I will feel better again.	1	2	3	4	5	6
2	As to my condition, what will be will be.	1	2	3	4	5	6



3	If I see my doctor regularly, I am less likely to have problems with my condition.	1	2	3	4	5	6
4	Most things that affect my condition happen to me by chance.	1	2	3	4	5	6
5	Whenever my condition worsens, I should consult a medically trained professional.	1	2	3	4	5	6
6	I am directly responsible for my condition getting better or worse.	1	2	3	4	5	6
7	Other people play a big role in whether my condition improves, stays the same, or gets worse.	1	2	3	4	5	6
8	Whatever goes wrong with my condition is my own fault.	1	2	3	4	5	6
9	Luck plays a big part in determining how my condition improves.	1	2	3	4	5	6
10	In order for my condition to improve, it is up to other people to see that the right things happen.	1	2	3	4	5	6
11	Whatever improvement occurs with my condition is largely a matter of good fortune.	1	2	3	4	5	6

12	The main thing which affects my condition is what I myself do.	1	2	3	4	5	6
13	I deserve the credit when my condition improves and the blame when it gets worse.	1	2	3	4	5	6
14	Following doctor's orders to the letter is the best way to keep my condition from getting any worse.	1	2	3	4	5	6
15	If my condition worsens, it's a matter of fate.	1	2	3	4	5	6
16	If I am lucky, my condition will get better.	1	2	3	4	5	6
17	If my condition takes a turn for the worse, it is because I have not been taking proper care of myself.	1	2	3	4	5	6
18	The type of help I receive from other people determines how soon my condition improves.	1	2	3	4	5	6

## **Debriefing**

University of Illinois at Urbana-Champaign  
Project Title: Understanding Older Adults' Intentions to Use Healthcare  
Technology

Thank you for participating in this research study. This research could not be conducted without your help.

Healthcare technologies can be significantly helpful for older adults. For example, various types of healthcare technologies can assist in the performance of daily activities, increase work efficiency, and lower care burden among family members. The purpose of this research study was to assess what older adults think about when considering using healthcare technologies. We are interested in understanding what older adults think about with regard to a variety of healthcare technologies and how their intentions to use those technologies change in relation to differing levels of technology complexity.

We covered many different topics in our session today. During the first part of the session, you were asked to complete a set of questionnaires including a technology readiness questionnaire and the technology experience questionnaire. The second part of the session was the interview in which we discussed your thoughts toward the three types of healthcare technologies. This part of your verbal responses was being recorded. During the last part of the session, we asked you to complete questionnaires including demographics and health locus of control. Your input is important; we hope that findings from this research study will help increase our understanding of what factors are important for developing healthcare technologies that can benefit the general population of older adults.

Please remember that all of your personal information and responses are confidential. In addition, all written and audio records will be kept in locked cabinets. Only research staff will be allowed to look at your responses. Your name and any other identifying information will not appear when results of this study are presented or published, unless you provided consent for us to do so.

Thank you for your time and involvement in this study!

If you have any questions or ways to improve our research, please contact:

Dr. Wendy A. Rogers  
Principal Investigator  
(217) 333-1470  
[wendyr@illinois.edu](mailto:wendyr@illinois.edu)

Maurita T. Harris  
Student Investigator  
(217) 300-5445  
[maurita2@illinois.edu](mailto:maurita2@illinois.edu)

## APPENDIX D - CODING SCHEME

Code	Subcodes	Related Questions
Icebreaker		What was the last healthcare technology that you used and what did you use it for?
Tech Discussed		
	Blood Pressure Monitor	
	Electronic Pill Box	
	Multifunctional Healthcare Robot	
Perceived Usefulness		Do you think this technology useful? a. If yes, "Why?" b. If no, "Why not?"
	Useful	
	Not Useful	
Relative Advantage		Do you currently use something similar to this technology? Is this a technology that you would currently use in place of your current method? 1. Do you see this new technology easier to use than (fill in the method or device that they are currently using)?
	Better (than current way)	
	Worse/Not better (than current way)	
Perceived Need		Do you need this technology to assist you in (fill in task of the technology)? Do you think this could be helpful for other people?
	Good for Others	

	Good for Me	
	Not Good for Me (right now, good for me in the future)	
Perceived Benefit		<p>What are some of the benefits that would come from using this technology?</p> <p>a. After talking about the benefits of using this technology, do you believe this new technology would improve your health at all?</p> <p>b. Do you see any challenges with how this technology would help with your health?</p>
	Advantages	
	Disadvantages	
	Can't think of any advantages or disadvantages	
Other		
Perceived Ease of Use		<p>How easy do you believe it would be to use this technology?</p> <p>Do you see this new technology easier to use than (fill in the method or device that they are currently using)?</p>
	Easy to use	
	Complexity	
Convenience/Inconvenience		Do you believe you would have to put forth any effort to use this technology? (e.g., time)
	Convenience (Effort to use)	
	Inconvenience	

Trust		Would you trust this technology?
	Conditional Trust	
	Trust in the person	
	Trust in the technology	
	Lack of trust	
Privacy		Do you believe this technology will get in the way of your privacy?
	Invades privacy	
	Supports privacy/Privacy is not an issue	
	Lack of privacy concern	
Familiarity		How familiar are you with this type of technology? Do you currently use something similar to this technology? (i.e., method or device) a. If yes: Can you describe it? i. Is this a technology that you would currently use in place of your current method or device?
	Familiar	
	Unfamiliar	
	Experience needed/see it	
Other		
Subjective Norm - Healthcare Provider		How would your healthcare provider feel about you using this technology?
	Positive	
	Negative	
	Not sure/Don't care	
	Other	
Subjective Norm - Family		How would your family feel about you using this technology?

	Positive	
	Negative	
	Not sure/Don't care	
	Other	
Subjective Norm - Friends		How would your friends feel about you using this technology?
	Positive	
	Negative	
	Not sure/Don't care	
	Other	
Advice Acceptance - Healthcare Provider		This technology is recommended by your healthcare provider, does this make you more likely to use it?
	More likely	
	Less likely	
	Not sure/Don't care	
	Other	
Advice Acceptance - Family		If a family member recommended you to use this technology, would this make you more likely to use it?
	More likely	
	Less likely	
	Not sure/Don't care	
	Other	
Advice Acceptance - Friends		If a friend recommended you to use this technology, would this make you more likely to use it?
	More likely	
	Less likely	
	Not sure/Don't care	
	Other	
Other		



Facilitating Conditions		Some people may or may not need help using this technology. Would you be comfortable using this new technology on your own? a. If yes: Why would you be comfortable using this technology on your own? b. If no: What would make you comfortable to use this technology on your own?
	Support wanted	
	No support wanted	
Perceived Cost (the whole section)		After reading the description, how much do you believe this new technology will cost? 20. You said that you believe this technology cost (insert amount they stated). If you had to pay that amount out of pocket to buy this new technology, would you use it? a. If yes: Why would you buy this technology? b. How about if your health insurance covered half of the cost, do you believe you would use this technology? c. How about if we offered it to you to take home for free, would you use this technology?
	Positives	
	Concerns	
	Price	
Compatibility		Do you believe you can easily incorporate this technology into your daily routine?
	Compatible	
	Incompatible	
Other		
User Characteristics		

	Self-Efficacy (Rating)	On a scale of 1 to 10, 1 being not confident and 10 being very confident, how confident are you that you could use this technology correctly?
Initial reactions		What do you think about this technology? How do you feel when you think of using this new technology?
	Positive	
	Negative	
	Other/Mixed	
Other		
Preferred Tech		
	Blood Pressure Monitor	
	Electronic Pill Box	
	Multifunctional Healthcare Robot	
Request for Information		
Technological Improvements		
Other		