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Behavioral Intention and Use Behavior of Social Networking Websites among Senior Adults

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Behavioral Intention and Use Behavior of Social Networking Websites
among Senior Adults


by
Andrew Mark Berry

A dissertation submitted in partial fulfillment of the requirements
for the degree of Doctor of Philosophy
in
Information Systems

College of Engineering and Computing
Nova Southeastern University

2017


We hereby certify that this dissertation, submitted by Andrew Berry, conforms to acceptable standards and is fully adequate in scope and quality to fulfill the dissertation requirements for the degree of Doctor of Philosophy.



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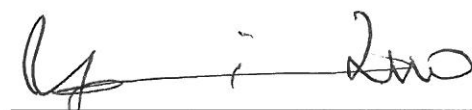


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2017

An Abstract of a Dissertation Submitted to Nova Southeastern University
in Partial Fulfillment of the Requirements for the Degree of Doctor of Philosophy

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by
Andrew M. Berry
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Use of social networking websites has rapidly increased over the last decade. Online social environments are quickly changing to meet the demands of younger users however the needs of senior adults are often ignored on most websites today and underrepresented in many Unified Theory of Acceptance and Use of Technology (UTAUT) studies. The study sought to close the gap in research by providing greater knowledge about the behavioral intention and use behavior of social networking websites among senior adults. Senior adults from several locations and organizations were asked to complete an online self-administered survey answering questions that tie directly into the research hypotheses for the study and the UTAUT model to identify specific factors that influence behavioral intention and use behavior of social networking websites. Implications of the study include a better understanding and discovery of the unique needs and requirements for seniors in relation to social networking websites.

Results of the study provided some important findings as the original hypotheses initially thought that the gender had a moderating effect on each performance expectancy, effort expectancy, or social influence as they each relate to a senior adult's behavioral intention to use social networking sites. However, conclusions were drawn from the data indicating that in all three instances, a significant correlation consistently did not exist among gender and performance expectancy, effort expectancy, or social influence respectively. In each instance, evidence for the moderating effect of gender was unable to be supported in stark contrast to what was previously thought at the onset of the study. It was further concluded that a senior adult's perceived performance expectancy, effort expectancy, and social influence were all found to be predictors of the senior's behavioral intention toward using a social networking website. Finally, a senior adult's perception of facilitating conditions and their actual behavioral intention to use a social networking website were found to be predictors of the senior's use behavior for a social networking website.

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My acknowledgements go deeper than I can possibly express in words alone, however I must start first and foremost with the patience, support, and encouragement from Dr. Maxine Cohen, my committee chair, Dr. Martha Snyder, and Dr. Ling Wang. My journey towards completion had many road bumps, detours, and pot holes—it is with sincere appreciation for Nova Southeastern University, my dissertation chair, and dissertation committee members that allowed me to succeed and push forward to the end when at some moments the light at the end of the tunnel seemed dim. The support of these individuals was crucial to my success and allowed me to both redeem myself and achieve my dreams and live up to my full potential as a doctoral student. Again, I cannot begin to express the gratitude that I have for each and every one of you in both a professional capacity and personally as it made all the difference in ways you may never realize—*thank you from the bottom of my heart.*

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Chapter 1

Introduction

Background

In recent years, social networking trends have risen to demand unprecedented levels of attention despite the already busy lives of most people today. Many younger adults have quickly latched onto these trends and now post dozens of “status updates,” “tweet” about their everyday lives, “comment” on their friend’s “wall posts,” and “like” new album photos that appear in their “news feed.” It is evident that much of this “technobabble,” also called “technospeak,” has now worked its way into the everyday language of a typical teenager or college student. Thus, research discussion of technology mostly revolves around young adults and leaves unanswered data gaps for other age groups (Chen & Chan, 2014). One might ask, what about the rest of society? Senior adults, in particular, have been falling noticeably behind in the scope of recent social networking trends (Duggan et al., 2015; Lenhart, 2009). Whether this is due to popular social networking websites not being designed with a universally usable senior-friendly interface, misinformed perception of the constructive and professional uses of these sites, or another reason altogether, this dissertation study uncovers more answers to an area that has been overlooked in the wake of recent catering to the dominating younger adult user group (Chen & Chan; Lüders & Brandtzæg, 2014).

Problem Statement

Social networking sites (SNSs) are not universally designed to engage senior adults in today's progressive multidirectional interactive online communities (Jaeger & Xie, 2009; Niehaves & Plattfaut, 2014; Redish & Chisnell, 2004). Despite their overwhelming popularity, senior adults are not actively using social networking sites (SNSs) nearly as much as younger online adults (Arjan, Pfeil, & Zaphiris, 2008; Jones & Fox, 2009; Lenhart, 2009; Waycott et al., 2016). Given the significance of a very large older adult population, it will be increasingly relevant for marketing, advertising, and other businesses to understand the behavioral intention and comprehensive use behavior of SNSs among seniors to gain insight into why they are not actively participating in such sites (Waycott et al., 2016). In 2009, surveys show that only 7% of senior adults 65 and older have a profile on a social network website in comparison to 10% of adults ages 55 to 64, 19% age 45 to 54, 30% age 35 to 44, 57% age 25 to 34, and 75% of young adults 18 to 24 (Lenhart). Only in 2014 did researchers see the first marked increase among adults 65 and older with more than half of online senior adults (56%) now using Facebook (Duggan et al., 2015). While the new influx of older users is an improvement in SNS usage among this age group, it is important to factor that the same data also show that overall growth with Facebook's platform is not just stagnant, it has slowed dramatically with the same 71% usage among all internet users in 2013 as in 2014 in comparison to other SNS studied such as LinkedIn (6% increase), Pinterest (7% increase), Instagram (9% increase), and Twitter (5% increase) who all saw statistically significant increases in 2014 (Duggan et al.). While Facebook has been the only SNS to finally attract senior adults in comparison to other SNS for the first time in 2014, this still

does not solve the overwhelming lack of usage among other trending SNS that operate in the same digital realm as Facebook that comprise millions of online adults, many that are not senior adults. Instagram currently boasts 53% usage among those 18 to 29 versus only 6% of senior adults over 65 of age (Duggan et al.). Despite the still overwhelming lack of SNS usage by seniors, the demographic is still considered the fastest growing segment of new computer and Internet users in addition to soon becoming the largest age group in the U.S. with an estimated one in five persons living in the U.S. being over the age 65 by 2050 (Robert & Labat-Robert, 2015; Washington, 2015; Wilson & Nicholas, 2008).

Dissertation Goal

The main goal for this dissertation research was to investigate and identify factors that influence behavioral intention and use behavior of major online social networking websites among senior adults using the Unified Theory of Acceptance and Use of Technology (UTAUT) model which is currently the most well-received technology acceptance model among research to-date (Steinke, 2015; Venkatesh, Morris, Davis, & Davis, 2003). For the purpose of this study, late adulthood is defined as persons age 65 and older (senior adults), middle-age adults are those between the ages of 40 and 64, younger adults are age 19 to 39, and adolescents are ages 13 to 18 (Erickson, 1950). The age groups of participants in this research study is senior adults age 65 or older as this age group has been neglected in recent years with more focus on younger adults or adolescents (Lüders & Brandtzæg, 2014; Pfeil, 2007a; Pfeil, 2007b). Discovering and analyzing data from this age group helps researchers to better develop and design all SNSs to actively engage seniors. Additionally, this dissertation study provides valuable

insight through reporting new findings from applying the UTUAT as a determinant for discovery of how senior adults' intention to use technology and their actual use behavior correlate to exogenous variables such as performance expectancy, effort expectancy, social influence, and facilitating conditions. Most past studies in the body of work involving the UTUAT have disregarded all moderation or mediation such as gender, age, experience, and voluntariness of use only to produce a study employing a subset of the UTUAT's principal constructs (Venkatesh, Thong, & Xu, 2003, 2012). This research study will be additionally including one of the four moderators of the UTUAT to strengthen the reported findings—gender. Such findings serve to assist website designers and developers in creating more universally accessible multidirectional interactive online communities, such as SNSs, that are specifically designed to cater to the unique needs of the senior adult demographic. Furthermore, the study is not limited to only the top five major social networking sites, which are Facebook, LinkedIn, Twitter, Instagram, and Pinterest as reported by recent demographic data (Duggan et al., 2015). Since the study is not looking at any one single SNS in particular, other websites that meet the defined criteria of SNSs such as YouTube or Google+ will be included in the reported findings. Ellison (2007) defines SNSs as web-based sites that allow individuals to construct a public or semi-public profile within a bounded system, articulate a list of other users with whom they share a connection, and view and traverse their list of connections and those made by others within the system.

Research Hypotheses

This study evaluated and assessed several research hypotheses derived from the UTUAT model (see Figure 1).

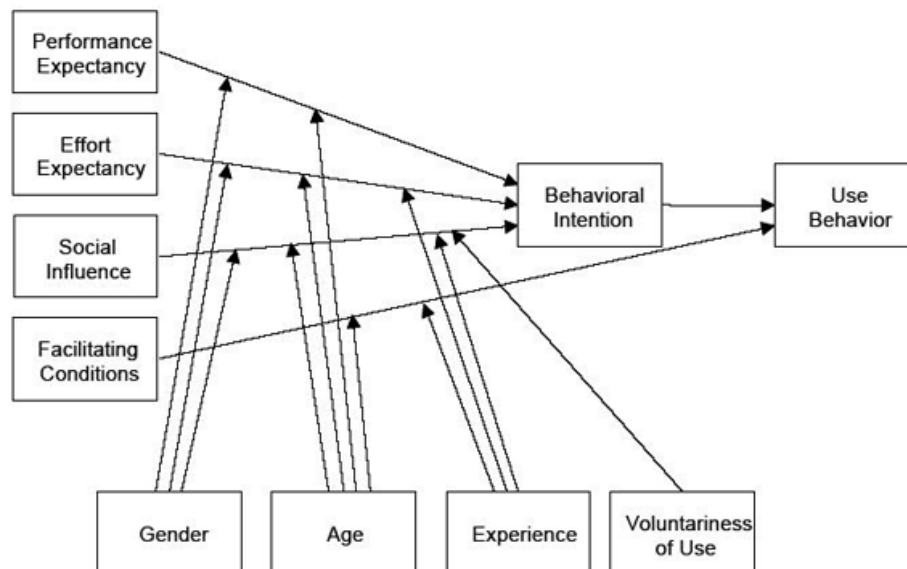


Figure 1. Unified Theory of Acceptance and Use of Technology by Venkatesh et al. (2003)

The following research hypotheses were all measured using data collected in the form of responses from a separate self-administered online survey that was e-mailed to several convenience samples of prospective senior adult participants:

- Research Hypothesis 1 (H1): *A senior adult's perceived performance expectancy positively influences the senior's behavioral intention toward using a social networking website.*
- Research Hypothesis 2 (H2): *A senior adult's perceived effort expectancy positively influences the senior's behavioral intention toward using a social networking website.*

- Research Hypothesis 3 (H3): *A senior adult's perceived social influence positively influences the senior's behavioral intention toward using a social networking website.*
- Research Hypothesis 4 (H4): *A senior adult's perception of facilitating conditions positively influences the senior's use behavior for a social networking website.*
- Research Hypothesis 5 (H5): *A senior adult's behavioral intention to use a social networking website positively influences the senior's use behavior for a social networking website.*
- Research Hypothesis 6 (H6): *The influence of performance expectancy on a senior adult's behavioral intention toward using a social networking website will be moderated by gender.*
- Research Hypothesis 7 (H7): *The influence of effort expectancy on a senior adult's behavioral intention toward using a social networking website will be moderated by gender.*
- Research Hypothesis 8 (H8): *The influence of social influence on a senior adult's behavioral intention toward using a social networking website will be moderated by gender.*

Furthermore, the previously stated research hypotheses were all sorted and analyzed by gender to allow for conclusions and comparisons to be drawn if gender affects perceived performance expectancy, effort expectancy, and social influence. Age

data were collected only for purposes of ensuring the studied population group of seniors age 65 and older are the only group included in data that was analyzed from this dissertation study.

Relevance and Significance

The problem of finding ways to design social networking sites to engage senior adults exists because there are currently few identified and fully tested best practices or directly relevant guidelines for accessible online communities (Nef, Ganea, Müri, & Mosimann, 2013). Existing guidelines primarily target the information dissemination function of a website and others are insufficient as they are designed to only evaluate one-way communication rather than multidirectional interactive communication found in today's Web 2.0 environments and online communities (Jaeger & Xie, 2009). The same guidelines often do not apply to senior adults or persons with common age-related impairments as they can sometimes be limited in their access to and use of new information and communication platforms by a wide range of factors from lack of ability to afford the new hardware, to accessibility problems with Internet service providers to web browsers that are not compatible with vital assistive technologies (Fox, 2004; Fox & Madden, 2006; UCLA, 2003). In 2009, the use of social networking sites was only 11% for senior adults ages 64 to 72 and a mere 4% for those over age 73; this is in comparison to 20% adults age 45 to 54, 36% adults age 33 to 44 and 67% of Generation Y young adults ages 18-32 (Jones & Fox, 2009). Since 2009, significant growth can only be seen among Facebook's online platform with now more than half (56%) of online adults 65 and older using the platform (Duggan et al., 2015). It is important to note that these statistics do not include the total "offline" population of senior adults and while Facebook

for the first year has seen statistically significant increases since it was founded in 2004, all other SNS still continue to dramatically fall behind in usage among senior adults which indicates that a problem still exists with adoption among this aging population separating these users from their younger counterparts on other online social platforms. The problem still directly affects senior adults over the age of 65 as additional research studies show that their actual use of social networking sites is still minimal as only 6% use Instagram, 10% are on Twitter, 17% on Pinterest, and 21% are using LinkedIn (Duggan et al.).

The benefit of solving the problem can be seen in many areas, including both in information technology and also outside the realms of computers in more humanizing ways. Findings from past research have shown that older adults view the act of keeping in touch as being worthy of time and dedication (Lindley, Harper, & Sellen, 2009). Consider the benefits of long-lost relatives finding each other or friends reuniting, military buddies staying in contact, including rekindling past romances. It is only SNSs that have the ability to dramatically increase these chances as Internet users who maintain profiles on SNSs are almost four times as likely as non-SNS users to have reportedly been contacted by someone from their past (Madden & Smith, 2010). Given that research shows social media users receive more contact from past connections, senior adults would most certainly benefit from reconnecting with people in their past (Madden & Smith).

Guidelines to assist in creating more generally accessible websites have been around for many years to assist website designers and developers and ensure a heightened level of website usability (Morrell, 2005). However, the indirect attempts to address

unique issues faced by senior adults through these more general guidelines is not sufficient because current emphasis on accessibility for senior adults is focused only on websites with one-way information provision instead of multidirectional interactive online communication found in social networking sites like Facebook, LinkedIn, Twitter, Google+, MySpace, and even interactive photo sharing websites similar to Instagram, SnapChat, Google's Picasa, and Yahoo!'s Flickr (Jaeger & Xie, 2009). Consequences of not having a well-established and usable set of guidelines that are specific to senior adults include the existence of SNSs that may be poorly suited for the unique needs of senior adults and therefore could also provide reasoning into why it is that senior adults are not actively using social networking sites nearly as much as younger online adults (Lenhart, 2009).

The goal of this study addresses the research problem by providing valuable insight into how senior adults perceive and use SNSs so that researchers can use the findings to develop better ways of designing multidirectional interactive online communities to be more universally accessible. Future studies can expand on the research and make use of any identified differences to provide additional valuable insight for the development of more universally accessible guidelines for use in SNSs designed to meet the needs of senior adults. The research gathered addresses the problem of the study by answering research hypotheses that further close the gap in research specific to the behavioral intention and use behavior of SNSs among the senior adult population. The research can further be used to provide website designers and developers of these types of multidirectional interactive online communities a better understanding of senior adults to improve their approach in accurately engaging the age group alongside the currently

dominating younger adult age group. This study adds to the existing knowledge base by providing human-computer interaction (HCI) researchers and practitioners the research and understanding they need to develop better guidelines for SNSs that aspire to adopt more universal usability in addition to helping them identify whether or not SNSs are actively meeting the needs of the senior adult population. The potential for generalization of the study's results also bleeds into improving certain types of website accessibility needs for individuals with disabilities of any age as common characteristics are shared between this group and senior adults—the most prevalent of which include common age-related challenges such as impaired vision and hearing, in addition to various cognitive and physical health issues. The realization of original work in this study was significant as there is little relevant research available in providing equal access to multidirectional interactive online communication in Web 2.0 environments for older adults as most of today's research is purely focused on only providing equal access to information itself (Jaeger & Xie, 2009).

Barriers and Issues

The goal of this research study was previously not met because SNSs have only recently become widespread over the last decade (Nyberg & Harr, 2015; USA Today, 2006). SNS's increasing usage by digital natives has quickly left senior adults playing catch-up when the benefits of multidirectional interactive online communication should be equally shared by all ages (Duggan et al., 2015). Social networking sites are an invention of recent years and therefore it has been only recently that researchers have discovered their inherent limitations in respect for the unique needs and desires of senior adults (Househ, Borycki, & Kushniruk, 2014). Current web design still does not suffice

in taking all of the needs of older users into account and can also inhibit the benefits of using SNSs (Nef, Ganea, Müri, & Mosimann, 2013). The expected degree of difficulty to identify differences in both behavioral intention and use behavior of major online social networking websites among senior adults and propose a set of guidelines to assist website designers and developers in creating SNSs that are more universally accessible for senior adults was considerable as there is currently a paucity of research available at the time of this writing and research (Lüders & Brandtzæg, 2014). Past research substantiates that understanding why users accept or reject technological innovations, such as social networking sites, is an inherently difficult and challenging research problem (Davis, Bagozzi, & Warshaw, 1989; Gangadharbatla, 2009; Swanson, 1988).

Limitations, Assumptions, and Delimitations

Limitations of the study included slight wording changes to the questions derived from Venkatesh, Morris, Davis, and Davis' (2003) original UTAUT research model that was included in the self-administered online survey and sent to prospective participants via e-mail. In addition to the typical alterations as done in previous UTAUT studies such as Spil and Schuring (2006) and Sundaravej (2010) only to appropriately match the subject material of the study, the limitation only exists specifically where questions assume the individual is working a job and thus such questions have been either removed or worded to take into consideration that some senior adults may not currently be working or retired and instead may be retired, volunteering, or seeking employment. Realizing the survey's potential to elicit fewer responses or incomplete responses from survey participants, making these minor wording changes to four questions in the study's

online survey assisted in the researcher's attempt to address this limitation as much as possible without altering the integrity of the survey questions.

Additionally, a pilot test was performed prior to the administration of the online survey to circumvent any unknown limitations that might arise and present an opportunity to make any necessary adjustments to time estimates, errors within the online survey instrument, or identifying other outliers which may need attention prior to administering the survey to the remainder of the population groups.

Assumptions of the study included the possibility of participants inflating their knowledge, skills, or experience as to not appear uneducated, computer illiterate, or ignorant regarding certain knowledge (Sax, Gilmartin, & Bryant, 2003). The online survey was completely anonymous, which was expected to aid in minimizing the effect of this particular assumption.

Delimitations intentionally imposed to constrain the scope of the study included the age of the studied population group being constrained to population groups of seniors age 65 and older and that the research hypotheses were all sorted and analyzed by one out of the four moderators of the UTAUT model to allow for conclusions and comparisons to be drawn if gender affected perceived performance expectancy, effort expectancy, and social influence.

Definition of Terms

Behavioral Intention

The degree to which an individual believes that he or she will engage in a given behavior (Institution of Medicine, 2002).

Effort Expectancy

The degree of ease associated with the use of the system (Venkatesh, Morris, Davis & Davis, 2003).

Endogenous Variable

A factor in a causal model or causal system whose value is determined by the states of other variables in the system (Pearl, 2000).

Exogenous Variable

A factor in a causal model or causal system whose value is determined by factors or variables outside the causal system under study (Engle, Hendry, & Richard 1983; Pearl, 2000).

Facilitating Conditions

The degree to which an individual believes that an organizational and technical infrastructure exists (Venkatesh, Morris, Davis & Davis, 2003).

Mediation Analysis

An analysis that demonstrates a data set is consistent within a model in which an intervening variable assisting in explaining the influences an independent variable has on a dependent variable (Aguinis & Gottfredson, 2010; Baron & Kenny, 1986; James & Brett, 1984; Judd & Kenny, 1981).

Moderation Analysis

A statistical analysis used to determine whether the relationship between two variables depends on, or is moderated by, the value of a third variable. The analysis places emphasis on the theory and subsequent hypotheses that surround the statistical test (Aguinis, 2004; Jaccard & Turrisi, 2003; Jose, 2013).

Multidirectional Interactive Online Communication

Means of connecting between people via pathways where information can flow in several directions simultaneously at the same time within a digital environment or community on the Internet (Jaeger & Xie, 2009).

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, Morris, Davis & Davis, 2003).

Senior Adult

For the purpose of this study, senior adults are defined as persons age 65 and older (Erickson, 1950; Fox, 2004).

Social Influence

The degree to which an individual perceives that other important people or groups of people believes he or she should use the new system (Venkatesh, Morris, Davis & Davis, 2003).

Social Networking Website

Web-based service that allows individuals to construct a public or semi-public profile within a bounded system, articulate a list of other users with whom they share a connection, and view and traverse their list of connections and those made by others within the system (Ellison, 2007). Examples include Facebook, LinkedIn, Twitter, Google+, MySpace, Instagram, SnapChat, Google's Picasa, and Yahoo!'s Flickr (Jaeger & Xie, 2009).

Use Behavior

The physical and mental acts involved in incorporating the information found into the person's existing information base (Wilson, 2000).

Usability

The extent to which a product can be used by specified users to achieve specific goals with effectiveness, efficiency, and satisfaction in a specified context of use (ISO 9241-11, 1998).

Summary

The rapid rise of the senior adult population's age longevity since the end of World War II eludes to the reality that those persons age 65 and older should not be ignored in current technology research studies (Robert & Labat-Robert, 2015). Considering the onset of longer living senior adults and increased importance in studying this ever-present age group, this dissertation study assists in closing the gap within research by providing greater knowledge about the behavioral intention and use behavior of today's leading social networking websites by the senior adult population.

The subsequent chapters of this dissertation are outlined as follows: Chapter 2 presents a literature review surrounding the core topics of the dissertation itself including the first Technology Acceptance Model and the more recent Unified Theory of Acceptance and Use of Technology. Due to the ever-changing technology landscape that exists in today's social networking sites, the literature review also addresses common age-related impairments specific to the senior adult age group among both traditional and newer challenges seniors now face. Social networking website usage is discussed alongside the presentation of the various facets of multidirectional interactive online communication that still are understudied and underrepresented (Jaeger & Xie, 2009). Chapter 3 outlines the methodology of the research study. Implementation of the research is presented which outlines the procedures, survey instrument, study participants and sample size. Reliability and validity dynamics are examined which present further rationale for how this research study identified various possible factors of why seniors do not use SNSs and thus provided useful and relevant data to assist in the increased inclusion of functionality, characteristics, and features that are more likely to be adopted

by senior adults in future iterations of SNSs (Gangadharbatla, 2009). Chapter 4 presents the results of the data analysis by addressing the research hypotheses. Factors that influence behavioral intention and use behavior of major online social networking websites among senior adults using the Unified Theory of Acceptance and Use of Technology model are identified and revealed along with all accompanying data from the data analysis. Finally, Chapter 5 draws inferences based on the results of the study through interpretation, examination, and concluding with implications of the contribution to research in addition to asserting recommendations for future research.

Chapter 2

Review of the Literature

Introduction

Although life expectancy was quite low for millennia, the combined average age of the human race has steadily increased to close to 50 years by the end of the 19th century and has now reached a combined average of 80 years for both sexes as of the year 2014 (Robert & Labat-Robert, 2015). Research suggests that the average human life expectancy is expected to only increase in the years ahead to or even above 120 years of age (Coles, 2013). This reality indicates senior adults age 65 and older will have an increasingly important place in current technology research studies in the many years to come, therefore there is significance in discovering how senior adults' intention to use current SNS and their actual use behavior correlate to different constructs of performance expectancy, effort expectancy, social influence, and facilitating conditions from the UTAUT model. Several differing technology acceptance models and theories will be discussed throughout this chapter and research will be presented that outlines current SNS usage and challenges among the senior adult age group.

The Technology Acceptance Model

In a study by Davis (1989), a valid measurement scale for predicting user acceptance of information systems was developed and quickly became the most widely accepted model for use in future research studies (Burton-Jones & Hubona, 2005). The

technology acceptance model (TAM) (see Figure 2) suggests that the ultimate adoption of any technological innovation depends on two key factors: *perceived usefulness* and *perceived ease of use* (Davis, Bagozzi, & Warshaw, 1989; Venkatesh & Morris, 2000).

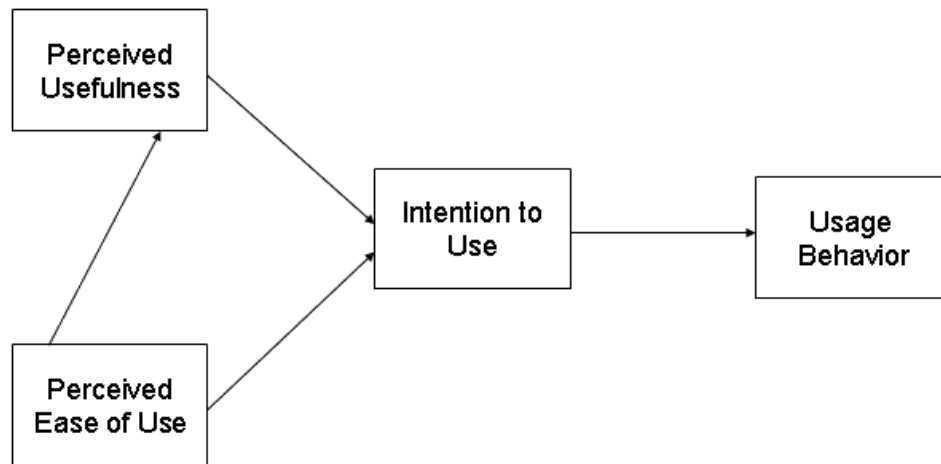


Figure 2. The first TAM published by Davis et al. (1989)

Application of the TAM in studies often shows that systems users find easy to use are generally perceived as useful. The TAM was originally developed for use in a corporate setting focused primarily on internal use; however, in other studies, such as those involving e-commerce web sites, it was eventually necessary to increase the range of the model's application to include additional constructs of *attitude toward using* a web site and *behavioral intention to use* the web site for future studies (Chen et al., 2004; Gefen et al., 2003; Klopping & McKinney, 2004). Although there have been other various modifications by Becker (2004), Shih (2004), and Phang, et al. (2005), none have been modified in a way that compensates for the unique considerations of senior adults until Smith (2007) proposed an extended TAM which accounts for the aging population. The successful TAM modifications (see Figure 3) added an additional external variable

of age to compensate for the aging differences of senior adults that impacts the two variables *Web Site Usability* and *Internet Usability*.

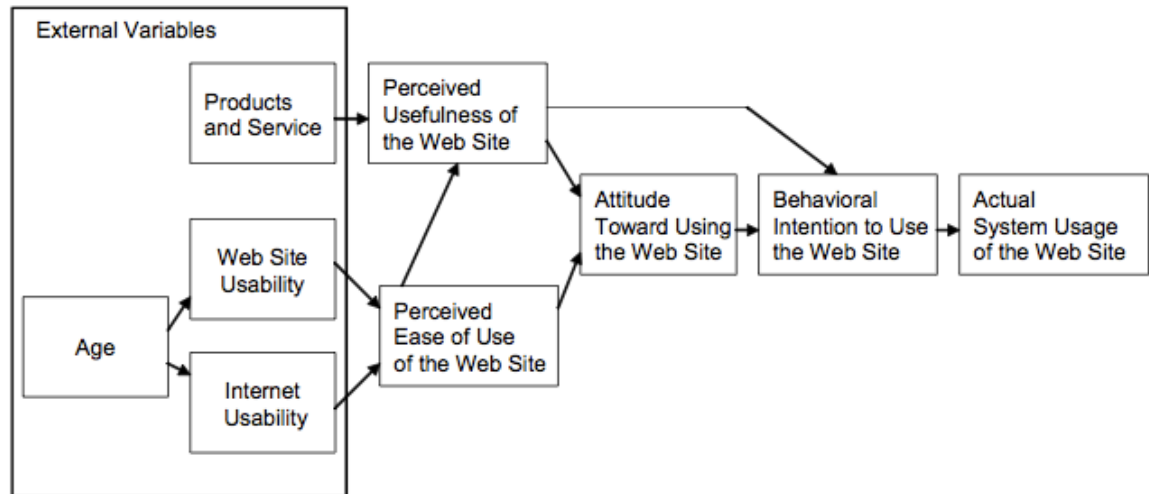


Figure 3. Extended TAM by Smith (2007) Compensating for Senior Adults

While the newer modified TAM by Smith (2007) has shown potential for further study and application, it is still an extension of the older TAM model developed in 1989 and does not take into account additional facets of perception and use variables introduced in the original researchers' updated 2003 model now regarded as the Unified Theory of Acceptance and Use of Technology (UTAUT) (Venkatesh, Morris, Davis & Davis, 2003).

Unified Theory of Acceptance and Use of Technology

Further studies by Venkatesh, et al. (2003) led to the creation of a newer more relevant model that is now focused on a unified view approach toward acceptance and use of technology developed through a review and consolidation of the constructs of eight other research models including the original TAM, the TAM 2, and the TAM3. The new UTAUT model has four key constructs: performance expectancy, effort expectancy,

social influence, and facilitating conditions (see Figure 4). The Facilitating Conditions construct is a determinant of use behavior while the other three are direct determinants of both usage intention and behavior. The impact of the four key constructs on use behavior and behavioral intention is moderated by gender, age, experience, and voluntariness of use in the model. Some items were found to not be significant moderators in the new UTAUT model therefore the not all moderators are used for every key construct as in the case with performance expectancy as it was only significant when examined in conjunction with the moderating effects of gender and age (Venkatesh et al., 2003, 2012).

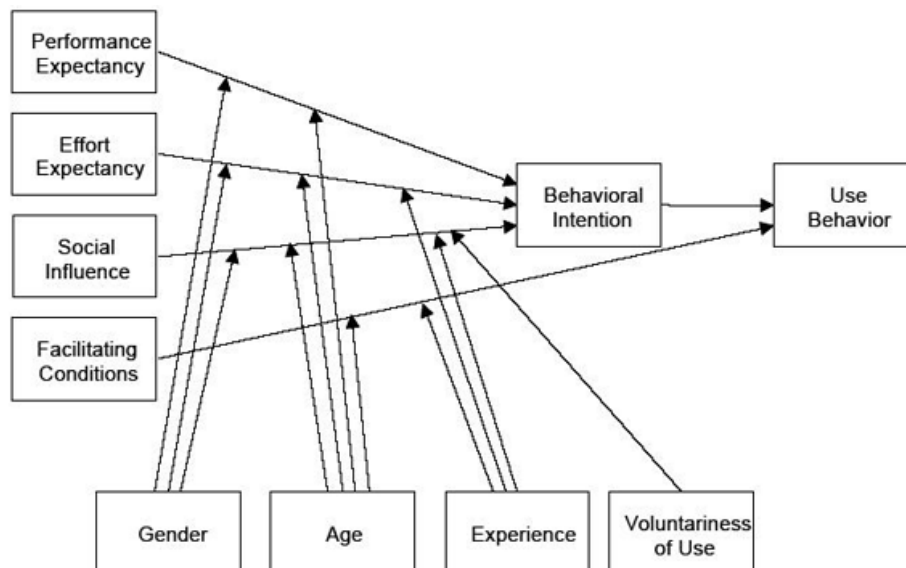


Figure 4. Unified Theory of Acceptance and Use of Technology by Venkatesh, Morris, Davis, and Davis (2003)

The UTAUT model has undergone various proposed modifications over the years with some studies bringing back the “attitude” component of the older TAM model which Venkatesh, et al. (2003) removed due to the effect of attitude on behavioral intention being spurious and emerging only when performance expectancy and effort expectancy are omitted from the model (Thomas, Singh, & Gaffar, 2013). Other

researchers such as Wang and Wang (2010) have since extended the UTAUT model to study the determinants and gender differences specific to mobile Internet acceptance. Perceived playfulness, perceived value, and palm-sized computer self-efficacy were three new constructs added in addition to choosing behavioral intention as a dependent variable and omitting behavior, facilitating conditions, experience, voluntariness, and age in the study. The extension of the UTAUT model by Wang and Wang (2010) is the most notable, reputable, and relevant UTAUT model extension in recent years, however there have been other newly proposed technology acceptance models targeted towards seniors which have assisted in expanding additional research outlets for this understudied population (Chen & Chan, 2014; van Biljon & Renaud, 2008; Washington, 2015). Chen and Chan proposed an updated Senior Technology Acceptance Model (STAM) that is based primarily from Davis' (1989) older and original TAM, but not after the fourth generation UTAUT model. The STAM (see Figure 5) differs from the TAM by integrating cognitive ability and gerontechnology anxiety variables (Chen & Chan, 2014; Steinke, 2015). Despite the STAM being a more recent adaptation of the original TAM, it has also been researched to a lesser degree than other studies involving the UTAUT where the STAM is reviewed in the literature but not actually utilized (Lüders & Brandtzæg, 2014; Niehaves & Plattfaut, 2014; Steinke). Steinke's results conclude that the UTAUT explains more than 70% of the variance in Internet adoption intention during their investigation of alternative theories that also factors in socio-demographic variables for technology acceptance research. Chen and Chan claim that their proposed STAM model could explain 68% of the variance in the use of gerontechnology. Both studies agree that age has a significant moderating effect among the senior adult demographic;

however, given that the UTAUT model has a more established presence in past studies it more importantly provides a solid set of constructs that are well established over many iterations of the TAM, TAM2, TAM3, and among other technology acceptance models integrated into the UTAUT (Steinke).

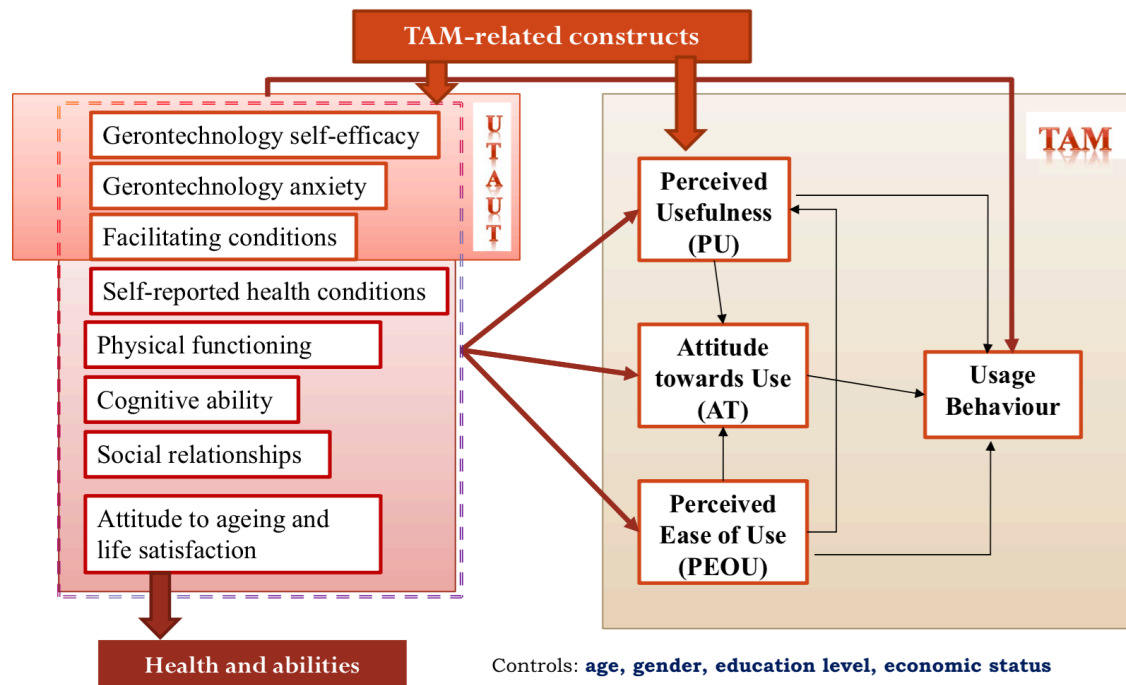


Figure 5. Senior Technology Acceptance Model by Chen and Chan (2014)

Application of the UTAUT can be seen in various studies such as one pilot study by Mallenius, Rossi, and Tuunainen (2007), which utilizes the UTAUT model to find that seniors are less likely to use mobile phones in comparison to younger individuals. Niehaves and Plattfaut (2014) provides the most relevant look into general Internet adoption by seniors in their empirical study also utilizing the UTAUT model with findings that elderly individuals are indeed more reluctant to use information technologies. Additional UTAUT research is recommended in practical applications for

reasons of intelligibility and feasibility as the findings of the study concluded that Internet adoption in general is significantly less than that of other age groups and UTAUT can explain more than 70% of the variance in intention among the seniors in their study. Age had a direct impact (negative effect on behavioral intention) as well as a significant moderating impact on the relationship between performance expectancy and behavioral intention with the expected performance of the Internet having a greater influence on the intention to use this technology among the senior adults in their study. Niehaves and Plattfaut (2014) acknowledge that their results are generalized to information technology as a whole focusing solely on the Internet, therefore the researchers conclude that more perspective can be obtained through more specific applications of their study when examining adoption of other technologies by senior adults. It is recommended that due to the lag behind senior adults face in using and benefiting from technology and more specifically the Internet within their study, additional research in other related or more specific areas is needed and suggested to aid in the discovery of emerging strategies and initiatives that can better inform senior adults that the use of information technology has much to offer them in terms of increasing their overall quality of life (Benckendorff, Sheldon, & Fesenmaier, 2014; Mitzner et al., 2010; Niehaves & Plattfaut, 2014).

However, other than demographic data, other research studies that look specifically at current trends in behavioral intention and use behavior of social networking sites are still scarce, and when factoring-in the senior adult population which is still largely understudied in most technology acceptance studies in comparison to other age groups, this only further validates the value of this dissertation study (Benckendorff,

Sheldon, & Fesenmaier, 2014; Chen & Chan, 2014; Duggen, et al., 2015; Hanson, 2009; Niehaves & Plattfaut, 2014; Smith, 2007; Wong, et al., 2012).

Common Age-Related Impairments and Challenges for Senior Adults

Senior adults often face common age-related impairments and challenges that most younger adults, teenagers, and children do not deal with on a daily basis. The Administration on Aging states that 20% of older adults experience some level of difficulty in performing activities of daily living (ADLs), often caused by decreased mobility, stamina, and muscle strength (Blaschke, Freddolino, & Mullen, 2009). Despite the onset of cognitive and physical health issues that seniors begin to face as they get older, utilizing social computing technology has shown to improve various aspects for senior adults in a positive light. Cognitive issues have been shown to be combatted through the use of stand-alone and online computer games, played socially with others in the same location or online, which offer the potential for mental stimulation, fun, and even therapeutic outcomes (Freddolino & Blaschke, 2008). Chat rooms and online discussion groups, which share similarities to many SNSs, have also been shown to enhance communication channels and social support, help seniors develop and sustain new friendships, and provide a sense of community (Novak, 2006; Russell, 1999). On the other side, some physically active senior adults like 75-year-old Scottie Brooks are saying, “I just don’t want to add that one more thing that keeps me sitting down” (Swift, 2010, p. 21). Such a statement indicates that older adults recognize that they need to get up and move instead of staying stationary behind a computer screen and desk when they are at an age where regular exercise and movement is important to their daily health to keep them feeling more energetic. Online social gaming has been a recent area where

technology has transcended into living rooms and a positive impact on the overall well-being of seniors can be seen as exercise is more often encouraged and social isolation is replaced with healthy stimulating social interaction (Jung, Li, Janissa, Gladys, & Lee, 2009).

Cognitive and physical challenges, including hearing and vision impairments, that senior adults face as they get older have also been shown to eventually lead to social isolation, depression, and an increased dependence on others for care (Cheek, Nikpour, & Nowlin, 2005). However, not all senior adults have fallen victim to these statistics. In a 50+ lifestyle magazine interview, Nancy Briggs, a 66-year-old grandmother, looks for ways to stay connected with her grandchildren and acknowledges both her realization and concern that society has consistently removed the more traditional or old-fashioned methods of phone calls or face-to-face relationships which have led to an increase in isolation from the younger generation of family members. Recently, she has started to slowly adjust to these changes and has now begun to utilize Facebook as a way to stay connected with her grandchildren by “grabbing onto whatever is offered” as a way to maintain that connection instead of losing it (Swift, 2010, p. 21). Other research shows that the use of computer-related technology has the potential to improve communication with family and friends, enable the development of new friendships, and support stronger intergenerational linkages which helps to subside social isolation and depression one may experience with age (Adler, 2006; White & Weatherall, 2000). New large-scale empirical research does show that among the general population of visually impaired Facebook users in comparison to other users, they do participate (e.g. status updates, comments, likes) as much as the general population and actually receive more feedback (i.e.

comments and likes) on average on their content (Wu & Adamic, 2014). While this study is the first of its kind among 50,000 visually impaired users of Facebook, it still does not address the senior population even within the studied sample or other social networks such as Twitter, let alone newer SNSs like Instagram. Recent research suggests and correlates the increasing importance for today's designs to be made in such a way that the majority of users are accommodated, which can be challenging for designers, however the needs of people who wear corrective lenses, have visual impairments, or are blind are a key indicator that designers still need to continue pursuing through the study of flicker, contrast, motion sensitivity, depth perception as well as the impact of glare and visual fatigue (Shneiderman, Cohen, Jacobs, Elmqvist, & Diakopoulos, 2017).

New Challenges to Aging Senior Adults in the 21st Century

Despite the many common age-related challenges that senior adults face, the onset of omnipresent computer technology in the 21st Century has also given rise to never-before-seen opportunities for aging seniors to strengthen both their mental abilities and emotional well-being. Mobile device usage among seniors is a new area of research where studies show that the usefulness and accessibility of such newer technologies allow for senior adults to experience positive outcomes in overall quality of life such as remaining in contact with their families and improve cognitive development (Washington, 2015). A study by Morris (2005), shows evidence that technology aids in reduced feelings of social isolation and depression in elderly individuals. Morris (2005) “used sensor data (measuring phone calls and visits) to derive public displays of social interactions with relatives and friends, which they introduced into select elder's homes. This approach shows the persuasive power of mobilizing concepts such as social

networks: as people see their social interactions illustrated in these feedback displays, their feelings of social isolation are subtly and gently refuted” (Churchill & Halverson, 2005, p. 7).

Social Networking Website Usage

In 2008, 35% of older adults age 65 and over reported using the Internet or e-mail while only one year later in December of 2009 the percentage rose barely 3% to a mere 38% of all U.S. senior adults age 65 and older that were using the Internet (Fox & Vitak, 2008; Rainie, 2010). The same study shows that 70% of adults age 50 to 64 and 85% of adults 30 to 49 reported having used the Internet or e-mail in 2008. Comparisons to younger adults show that a significantly higher statistic of 90% of 18 to 29 year olds that report to be using the Internet on a regular basis (Rainie). Only 42% of adults 50 and older send text messages via a cellular or smartphone device versus 85% of 13 to 24 year old adults (Marcus, 2013). Until recently, statistics representing usage of SNSs were even more bleak with surveys showing that only 7% of senior adults 65 and older had a profile on a social network website in comparison to 75% of adults 18 to 24 (Lenhart, 2009). The year 2014 became noteworthy for seniors as it was the first year researchers saw more than half of online adults 65 and older (56%) now using Facebook (Duggan et al., 2015). However, Facebook is the only platform with these numbers as other trending SNS such as Instagram have significantly less usage among online senior adults at only 6% usage, Twitter has 10%, Pinterest has 17%, and LinkedIn has the second largest usage at 21% usage among seniors. The same research shows that Facebook may not be the best indicator of SNS usage in the near future as its limelight status has recently fallen as indicated by statistics from 2013 to 2014 indicating usage has stayed stagnant at the same

71% usage among all online adults while other SNS have risen significantly in popularity and are trending among the younger generations at a much faster rate (Duggan et al.; Pfeiffer, KleeB, Mbelwa, & Ahorlu, 2014). Surprisingly enough, there is not enough knowledge to gain insight into why senior adults are still not actively participating in most SNSs and still very little that is being done to encourage them to actively use such sites despite the fact that their demographic is still considered the fastest growing segment of new computer and Internet users in addition to soon becoming the largest age group in the U.S. with an estimated one in five persons living in the U.S. being over the age 65 by 2050 (Wilson & Nicholas, 2008). Some experts say it is the fear of technology in general and the cost of computer equipment and Internet service that can be the biggest obstacles to keeping older adults from using the Internet for communicating (Vickrey, 2010). It is also possible that much of the lack of participation among senior adults in SNSs may be due to oversight in the area of web site accessibility and usability tailored not just for younger users, but also for persons with disabilities and older adults—also known as universal accessibility, which is shown to be essential for social inclusion among online communities (Jaeger & Xie, 2009). Research shows that even websites specifically targeting older users often do not design with the needs of these users in mind (Czaja, Sharit, & Nair, 2008; Hanson, 2009).

Multidirectional Interactive Online Communication

Senior-friendly web sites accommodating the special needs of older adults can generally be achieved by implementing a set of empirical guidelines developed by the National Institute on Aging (NIA) and the National Library of Medicine (NLM) (Morell, 2005). The research looks at changes in cognitive, physical, and perceptual abilities and

then examines any age-related changes to these factors to determine if and how they affect computer use among older users and is still utilized in current research studies (Leung, 2014; NIA & NLM, 2001). The four significant requirements to more easily assist older adults and persons with disabilities in using web sites are: providing readable text, presenting information in a way that is easy to understand, incorporating nontext-based media to facilitate information transfer, and organizing the web site in a way that is easy to navigate. Other guidelines set forth by the World Wide Consortium's Web Accessibility Initiative (WAI) and also Section 508 of the Rehabilitation Act, which was developed by U.S. federal government agencies much like the previously discussed NIA and NLM guidelines, have attempted to address accessibility-related issues with web sites however much of the responsibility currently has been placed on the older users instead of the actual developers and designers of the web site (Jaeger & Xie, 2009). For this reason, the NIA/NLM guidelines are the preferred, and often only, practical approach toward addressing accessibility-related issues on web sites (Sloan, 2006). Even so, existing guidelines are insufficient when evaluating online communities as one-way communication provisions are considered antiquated in comparison to the recent focus now placed on newer innovative multidirectional interactive online communication in SNSs such as Facebook and Twitter. Jaeger and Xie (2009) have proposed a generalized starting point for designing accessible online communities for persons with disabilities and older adults, however their suggestions end at the close of a brief literature review without any actual testing or follow-through in a controlled research environment.

Summary

The substantial growth of SNSs over the last several years is hard to ignore. The move from one-way information transfer to more prominent multidirectional interactive online communication has seemingly taken the world by surprise almost overnight (Jaeger & Xie, 2009). Much of the research to-date has focused primarily on design guidelines and other various studies related primarily to traditional information-oriented web sites rather than today's communication-oriented web sites such as online communities where the Internet browsing experience is much more "conversational" among networks of friends, professional contacts, recreational affiliations, or other social groups (Lankes, Silverstein, & Nicholson, 2007). Although not all existing guidelines and policies have been updated or revised to reflect the new communication-oriented focus of newer websites, such as Facebook and other SNSs, research suggests that they can still be used as a starting point in designing accessible online communities even for persons with disabilities and older adults (Jaeger & Xie).

The research completed and analyzed within this dissertation is substantial and relevant, as it presents more practical knowledge for other researchers to use when studying how senior adults utilize social networking sites. The research primarily provides core data from a HCI stance to assist in finding ways SNSs can increase participation from senior adults and possibly even for corporate marketing reasons to tap into the specific age group for an increase in financial profit. In 2025, 17.9% (or 63.9 million) of the United States population will be 65 or older versus 12.7% in 2008 (Marcus, 2013). Given the intense consumer/user focus on social networking sites in the past few years, the predicted growth of the senior adult population, and the lack of

research in this field of study, it is evident that additional research is both necessary and of significant value (Jaeger & Xie, 2009).

Chapter 3

Methodology

Introduction

The current lack of research of online social interactions within the senior citizen population warrants further investigation (Lüders & Brandtzæg, 2014; Pfeil, 2007a; Pfeil, 2007b). Even though their population continues to grow consistently, seniors were not only often overlooked in the first Technology Acceptance Model (TAM), but are also still underrepresented in newer Unified Theory of Acceptance and Use of Technology (UTAUT) research studies (Niehaves & Plattfaut, 2014; Smith, 2007). Senior adults are a growing age group that warrants the need and opportunity for more research to be explored among their population (Nef, Ganea, Müri, & Mosimann, 2013; Washington, 2015). Many studies involving younger people using SNSs have been conducted in recent years however much less research exists that focus exclusively on today's trending social networking usage and behavioral intention specifically among seniors age 65 and above, with studies especially lacking in those that utilize newer technology acceptance models such as the UTAUT model (Hanson, 2009; Lampe, Ellison, & Steinfield, 2008; Leist, 2013; Lüders & Brandtzæg; Niehaves & Plattfaut, 2014). Given that not much research pertaining to seniors has been conducted surrounding SNS behavioral intention and use behavior, this dissertation principally focuses on the latter assisting in the expansion of research in a similar manner that Niehaves and Plattfaut (2014) accomplished by exclusively representing the senior population in their study involving general Internet

adoption but instead looked specifically at social networking sites to better provide a more thorough understanding in why seniors are lagging behind in the use of today's social networks.

Research Overview

Although this study evaluated and assessed several research hypotheses derived from the original UTAUT model (see Figure 1), the researcher simplified the existing model to incorporate only the factors that pertain to this study and the data that were later collected from participants along with indicating how the research hypotheses align with the UTAUT model (see Figure 6).

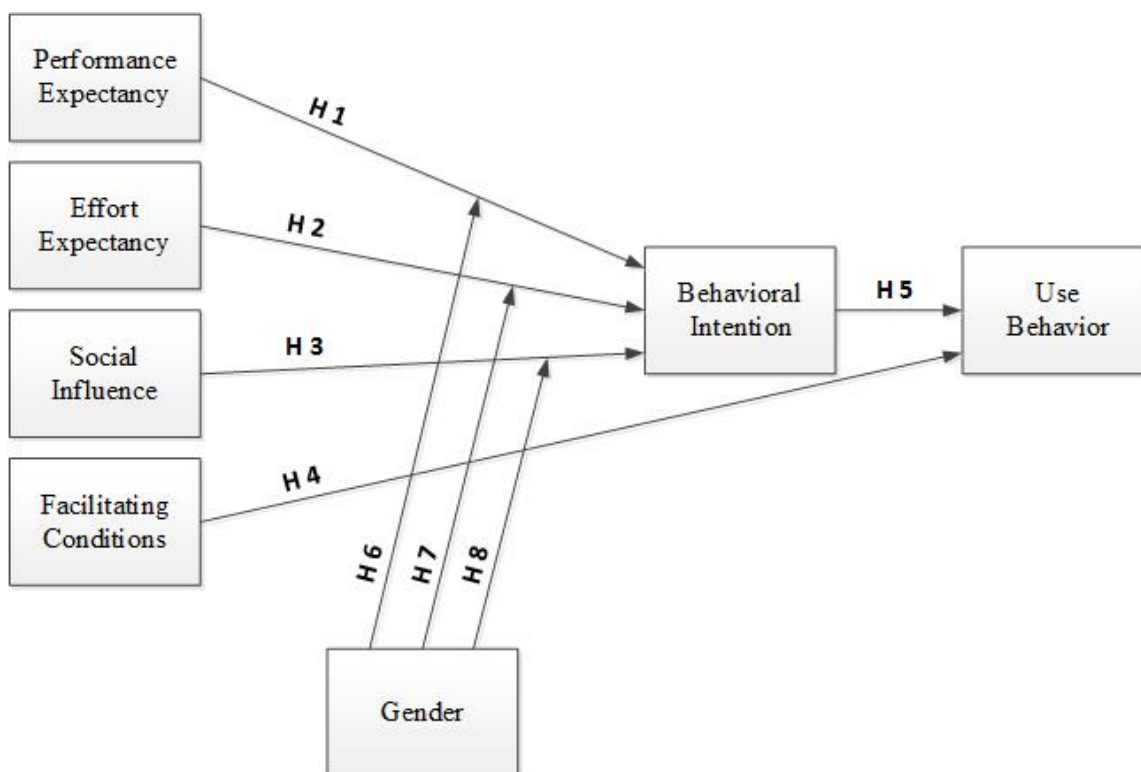


Figure 6. Simplified Unified Theory of Acceptance and Use of Technology (adapted from Venkatesh, Morris, Davis, and Davis, 2003)

The following research hypotheses were all measured using data collected in the form of responses from a separate self-administered online survey that was e-mailed to several convenience samples of prospective participants:

- Research Hypothesis 1 (H1): *A senior adult's perceived performance expectancy positively influences the senior's behavioral intention toward using a social networking website.*
- Research Hypothesis 2 (H2): *A senior adult's perceived effort expectancy positively influences the senior's behavioral intention toward using a social networking website.*
- Research Hypothesis 3 (H3): *A senior adult's perceived social influence positively influences the senior's behavioral intention toward using a social networking website.*
- Research Hypothesis 4 (H4): *A senior adult's perception of facilitating conditions positively influences the senior's use behavior for a social networking website.*
- Research Hypothesis 5 (H5): *A senior adult's behavioral intention to use a social networking website positively influences the senior's use behavior for a social networking website.*
- Research Hypothesis 6 (H6): *The influence of performance expectancy on a senior adult's behavioral intention toward using a social networking website will be moderated by gender.*

- Research Hypothesis 7 (H7): *The influence of effort expectancy on a senior adult's behavioral intention toward using a social networking website will be moderated by gender.*
- Research Hypothesis 8 (H8): *The influence of social influence on a senior adult's behavioral intention toward using a social networking website will be moderated by gender.*

Although the survey was sent to differing age groups, age data were not analyzed. It was only used to ensure only responses from senior adult participants of the various convenience samples were collected and used in this study. The research hypotheses were all sorted and analyzed by gender to allow for conclusions and comparisons to be drawn if gender affected perceived performance expectancy, effort expectancy, and social influence.

Implementing the Research

Procedure

The major steps toward accomplishing the research hypotheses and goal of the research study were as follows:

1. A self-administered online survey was developed for sending to prospective participants via e-mail. Questions were derived from Venkatesh, Morris, Davis, and Davis' (2003) original list of items used in estimating UTAUT (see Table 1) and were slightly modified as typically done in previous UTAUT studies such as Spil and Schuring (2006) and Sundaravej (2010) only to appropriately match the subject material of the study, which in this study looks specifically at social

networking sites and was worded to be representative of how a typical end-user would communicate within a multidirectional interactive online community (Spil & Schuring, 2006; Sundaravej, 2010). Venkatesh's et al. (2003) original list of items used in estimating UTAUT initially dropped self-efficacy, anxiety, and attitude toward using technology as it was discovered during their study that these three items did not have any direct effect on behavioral intention and the model was estimated again with the items dropped as seen in Table 1. The results of the reestimated model from the original study can be found in Table 2. These three dropped items were not included in the study and the remainder items of the final UTAUT model was used which are: performance expectancy, effort expectancy, social influence, facilitating conditions, and behavioral intention to use the system. Questions that assume the individual is working a job were worded or removed to take into consideration that some senior adults may not currently be working and instead may be retired, volunteering, or seeking employment—this known limitation has been addressed in the Assumptions, Limitations, and Delimitations section of Chapter 1. The wording of the three questions aligning to behavioral intention have been changed to match that of a later study by Venkatesh, Thong, and Xu (2012) where the value placeholder <n> is no longer utilized and future tense verbiage is used instead. All questions linked directly to performance expectancy, effort expectancy, social influences, and facilitating conditions in addition to the four moderating variables of gender, age, experience, and voluntariness of use in relation to the behavioral intention towards social networking site usage among the senior adult population. The modified constructs

for this dissertation study can be found in Table 3 which drop all three items that did not have any direct effect on behavioral intention from the test results of the reestimated UTAUT model seen in Table 2. Gender and age data were also collected in the survey; however only gender data were sorted and analyzed in this study as age data were used to ensure the only data reported was from the senior adult age group. The use of a self-administered online survey ensured that a good sampling of participants from the senior adult population were chosen to support the research hypotheses and the goal of the study. In addition, the online survey format helped to minimize response bias through the randomization of questions and response options.

Items Used in Estimating UTAUT	
Performance expectancy	
U6:	I would find the system useful in my job.
RA1:	Using the system enables me to accomplish tasks more quickly.
RA5:	Using the system increases my productivity.
OE7:	If I use the system, I will increase my chances of getting a raise.
Effort expectancy	
EOU3:	My interaction with the system would be clear and understandable.
EOU5:	It would be easy for me to become skillful at using the system.
EOU6:	I would find the system easy to use.
EU4:	Learning to operate the system is easy for me.
Attitude toward using technology	
A1:	Using the system is a bad/good idea.
AF1:	The system makes work more interesting.
AF2:	Working with the system is fun.
Affect1:	I like working with the system.
Social influence	
SN1:	People who influence my behavior think that I should use the system.
SN2:	People who are important to me think that I should use the system.
SF2:	The senior management of this business has been helpful in the use of the system.
SF4:	In general, the organization has supported the use of the system.
Facilitating conditions	
PBC2:	I have the resources necessary to use the system.
PBC3:	I have the knowledge necessary to use the system.
PBC5:	The system is not compatible with other systems I use.
FC3:	A specific person (or group) is available for assistance with system difficulties.
Self-efficacy	
	I could complete a job or task using the system...
SE1:	If there was no one around to tell me what to do as I go.
SE4:	If I could call someone for help if I got stuck.
SE6:	If I had a lot of time to complete the job for which the software was provided.
SE7:	If I had just the built-in help facility for assistance.
Anxiety	
ANX1:	I feel apprehensive about using the system.
ANX2:	It scares me to think that I could lose a lot of information using the system by hitting the wrong key.
ANX3:	I hesitate to use the system for fear of making mistakes I cannot correct.
ANX4:	The system is somewhat intimidating to me.
Behavioral intention to use the system	
BI1:	I intend to use the system in the next <n> months.
BI2:	I predict I would use the system in the next <n> months.
BI3:	I plan to use the system in the next <n> months.

Table 1. Items Used in Estimating UTAUT by Venkatesh, Morris, Davis, and Davis (2003)

Preliminary Test of UTAUT								
(a) Dependent Variable: Intention								
	T1 (N = 215)		T2 (N = 215)		T3 (N = 215)		Pooled (N = 645)	
	D ONLY	D + I	D ONLY	D + I	D ONLY	D + I	D ONLY	D + I
R ² (PLS)	.40	.51	.41	.52	.42	.50	.31	.76
R ² (hierarchical regrn.)	.39	.51	.41	.51	.42	.50	.31	.77
Adjusted R ² (hierarchical regrn.)	.35	.46	.38	.46	.36	.45	.27	.69
Performance expectancy (PE)	.46***	.17*	.57***	.15*	.59***	.16*	.53***	.18*
Effort expectancy (EE)	.20*	-.12	.08	.02	.09	.11	.10	.04
Social influence (SI)	.13	.10	.10	.07	.07	.04	.11	.01
Facilitating conditions (FC)	.03	.04	.02	.01	.01	.01	.09	.04
Gender (GDR)	.04	.02	.04	.01	.02	.01	.03	.01
Age (AGE)	.08	.02	.09	.08	.01	-.08	.06	.00
Voluntariness (VOL)	.01	.04	.03	.02	.04	-.04	.02	.00
Experience (EXP)							.04	.00
PE × GDR		.07		.17*		.06		.02
PE × AGE		.13		.04		.10		.01
GDR × AGE		.07		.02		.02		.06
PE × GDR × AGE		.52***		.55***		.57***		.55***
EE × GDR		.17*		.08		.09		.02
EE × AGE		.08		.04		.02		.04
EE × EXP								.02
GDR × AGE (included earlier)		Earlier		Earlier		Earlier		Earlier
GDR × EXP								.02
AGE × EXP								.01
EE × GDR × AGE		.22**		.20***		.18*		.01
EE × GDR × EXP								-.10
EE × AGE × EXP								-.02
GDR × AGE × EXP								-.06
EE × GDR × AGE × EXP								-.27***
SI × GDR		.11		.00		.02		.02
SI × AGE		.01		.06		.01		.02
SI × VOL		.02		.01		.02		.06
SI × EXP								.04
GDR × AGE (included earlier)		Earlier		Earlier		Earlier		Earlier
GDR × VOL		.01		.04		.02		.01
GDR × EXP (included earlier)								Earlier
AGE × VOL		.00		.02		.06		.02
AGE × EXP (included earlier)								Earlier
VOL × EXP								.02
SI × GDR × AGE		-.10		.02		.04		.04
SI × GDR × VOL		-.01		.03		.02		.01
SI × GDR × EXP								.01
SI × AGE × VOL		-.17*		.02		.06		.06
SI × AGE × EXP								.01
SI × VOL × EXP								.00

Table 2. Preliminary Test of UTAUT by Venkatesh, Morris, Davis, and Davis (2003)

Preliminary Test of UTAUT (Continued)								
	T1 (N = 215)		T2 (N = 215)		T3 (N = 215)		Pooled (N = 645)	
	D ONLY	D + I	D ONLY	D + I	D ONLY	D + I	D ONLY	D + I
GDR × AGE × VOL		.02		.02		.01		.00
GDR × AGE × EXP (included earlier)								Earlier
GDR × VOL × EXP								.00
AGE × VOL × EXP								.01
SI × GDR × AGE × VOL		.25**		.23**		.20*		.04
GDR × AGE × VOL × EXP								.02
SI × GDR × AGE × VOL × EXP								-.28***
(b) Dependent Variable: Usage Behavior								
R ² (PLS)	.37	.43	.36	.43	.39	.44	.38	.53
R ² (hierarchical regrn.)	.37	.43	.36	.43	.39	.43	.38	.52
Adjusted R ² (hierarchical regrn.)	.36	.41	.35	.40	.38	.41	.37	.47
Behavioral intention (BI)	.61***	.57***	.60***	.58***	.58***	.59***	.59***	.52***
Facilitating conditions (FC)	.05	.07	.06	.07	.18*	.07	.10	.11
Age (AGE)	.02	.02	.01	.02	.04	.13	.04	.08
Experience (EXP)								.06
FC × AGE		.22*		.24*		.27**		.02
FC × EXP								.00
AGE × EXP								.01
FC × AGE × EXP								.23**

Table 2 (continued). Preliminary Test of UTAUT by Venkatesh, Morris, Davis, and Davis (2003)

Table 3

Construct and Items for PE, EE, SI, FC, and BI Derived from the UTAUT

Construct	Items
Performance Expectancy (PE)	
PE1:	I find SNSs useful.
PE2:	Using SNSs enables me to accomplish tasks more quickly.
PE3:	Using SNSs increases my productivity.
Effort Expectancy (EE)	
EE1:	My interaction with SNSs would be clear and understandable.
EE2:	It would be easy for me to become skillful at using SNSs.
EE3:	I would find SNSs easy to use.
EE4:	Learning to operate SNSs is easy for me.
Social Influence (SI)	
SI1:	People who influence my behavior think that I should use SNSs.
SI2:	People who are important to me think that I should use SNSs.
SI3:	My friends and family have been helpful in the use of SNSs.
Facilitating Conditions (FC)	
FC1:	I have the resources necessary to use SNSs.
FC2:	I have the knowledge necessary to use SNSs.
FC3:	SNSs are not compatible with other websites that I use.
FC4:	A specific person (or group) is available for assistance with SNSs difficulties.
Behavioral Intentions to Use SNSs (BI)	
BI1:	I intend to continue using SNSs in the future.
BI2:	I will always try to use SNSs in my daily life.
BI3:	I plan to continue to use SNSs frequently.
Actual Usage Behavior of SNSs (UB)	
UI1:	I currently use SNSs (n).
n= 0:	I do not use SNSs at all.
n= 1:	less than once a week.
n= 2:	about once each week.
n= 3:	several times each week.
n= 4:	about once each day.
n= 5:	several times a day.

2. An initial pilot test was conducted and initially expected to have no more than three to five participants comprised of both male and female senior adults 65 years of age or older that were personally or professionally known by the researcher and all originated from outside of the population groups utilized in the study. During the actual pilot test five participants were utilized and participated as pilot test participants. The self-administered online survey was e-mailed to the pilot test participants to complete within seven days. Results were collected for purposes of identifying that the survey was functioning as anticipated by the researcher and an individual feedback session was conducted with each pilot test participant to obtain their individual account of the survey completion experience. The introduction of a pilot test prior to the administration of the online survey assisted in the circumvention of any unknown limitations that could have potentially surfaced upfront and further presented an opportunity to make the necessary adjustments to anticipated time estimates, addressing any unforeseen errors within the online survey instrument, and identifying other problems which may have necessitated attention prior to administering the survey to the entire remainder of each population group. The results of the pilot test implied a need to update the initial timeframe expected for participants to complete the online survey and also revealed an essential mobile-friendly version of the online survey was desired by those utilizing their mobile devices or smartphones to complete the survey—these findings are discussed in greater detail and further explored in Chapter 4.

3. Non-random convenience samples of both male and female senior adults 65 years of age or older were used from three population groups in the Southern states of the United States of America. Since the researcher has access to a large diversity of resources in Alabama, Georgia, and Tennessee, the availability and prospect to obtain a good homogeneous distribution from the South was more attainable versus that of other geographic regions. No population group had less than 15 male and 15 female senior adult participants, which constituted a minimum of 30 participants for each homogeneous group. The researcher expected to receive the minimum stated responses for each population group, however it was not known how many responses would be expected as there was no limit, threshold, or maximum number of responses for the study—given the number of individuals the survey was to be sent out to, it was likely that a more than sufficient response would be expected from senior adults in each population group. An email was sent to the following senior adult populations that included a hyperlink pointing to the self-administered online survey after the researcher obtained explicit permission to conduct research from each site (see Appendix A, B, and C):
 - a. Church members, pastors, and staff across the Alabama South District Church of the Nazarene headquartered in Prattville, AL. The Alabama South District Church of the Nazarene has over 4,000 active members of various age groups with an estimated 800+ members who are senior adults. All participants were senior adults 65 years of age or older and resided mainly in the state of Alabama.

- b. Church members, pastors, and staff across the South Coastal District of the Wesleyan Church headquartered in Conyers, GA. The South Coastal District of the Wesleyan Church has over 7,000 active members of various age groups with an estimated 2450 members who are senior adults. All participants were senior adults 65 years of age or older and resided mainly in the states of Alabama, Mississippi, and Georgia.
 - c. Students, faculty, administration, and alumni of Trevecca Nazarene University located in Nashville, TN. Trevecca Nazarene University has almost 3,000 enrolled students of various ages and tens of thousands more alumni who are part of the Trevecca Alumni Association since the University was founded in 1901. All participants were senior adult students and alumni residents 65 years of age or older of the Greater Nashville Area, with the exception of some out-of-state alumni and online program students that may have resided in other states.
4. Responses were analyzed from the results of the data collection from the self-administered online surveys based upon their reported use of various social networking sites as to support the goal of this study in determining the correlations between the variables and moderators on behavioral intention and use behavior in relation to social networking site usage among the senior adult population. Data that indicates which of the three population groups a participant

is associated with was collected as to ensure the data were available for further analysis if necessary.

Instrument Development

The instrument used to collect data from participants was in the form of a self-administered online survey developed from the constructs and items of the UTAUT research model (see Table 3). Similar to other UTAUT studies, each question on the survey utilized a Likert scale for respondents to select their responses which is outlined in the “Scale Used for Survey Instrument Questions” in Appendix E. The survey comprised of 22 questions in total: five questions related to demographics and 17 corresponding to the various constructs and items of the UTAUT (see Appendix F). Questions were manually input into SurveyMonkey’s online website and developed to identically replicate each question electronically as to create a self-administered online survey which was later sent out via e-mail to prospective participants of the Alabama South District Church of the Nazarene, South Coastal District of the Wesleyan Church, and Trevecca Nazarene University. The initial introductory recruitment e-mail preceding the survey solicited voluntary participation from each population (see Appendix G). The introductory e-mail provided brief information to recipients regarding the survey while the attached online survey instructions and a participation letter included detailed instructions that outlined the research topic, purpose of the study, confidentiality, refusal to participate, and other specific information regarding the voluntary participation of the study (see Appendix H). Initial estimated survey administration time varied, however each participant was not expected to exceed a maximum of 45 minutes of cumulative time to read the initial e-mail, open the survey in any web browser, and complete the

online survey. The survey collection lasted a total of 14 days. The first cycle when surveys were initially sent out to each population group lasted 10 days. The second cycle was shorter in length and began on day 11 following the initial survey with one additional reminder e-mail being sent out to each of the population groups as the researcher's last opportunity to request their participation in the study. The second cycle lasted four days while survey responses continued being collected until the end of day 14 when the survey collection period ended.

Study Participants and Sample Size

The sample population criteria required that prospective survey respondents be senior adults age 65 years or older, have access to the Internet, and have a personal or work email account. The non-random convenience sample from the Alabama South District Church of the Nazarene, South Coastal District of the Wesleyan Church, and Trevecca Nazarene University produced a combined total of 14,000 prospective survey respondents of various age groups. Surveys were sent to respondents of all ages however, other age groups were not eligible to participate further as only results and data from the senior adult population age 65 years or older was included, sorted, or analyzed in this study. Although unlikely, the researcher predetermined if any population group response rate was less than the minimum of 15 male and 15 female senior adult participants, which constitutes a minimum of 30 participants for each homogeneous group, the data from that population group will be reported but would not be analyzed further in this study. Utilization of three separate population groups was aimed to ensure a reasonable expectation that sufficient responses were obtained to accurately report on the findings of the data.

Explicit permission was obtained from each organization prior to conducting any research or distributing the online self-administered survey to human subjects (see Appendix A, B, and C). Institutional Review Board (IRB) approval at Nova Southeastern University was sought after and secured to protect the integrity of the research and the safety of its participants as this dissertation study involves human subjects (see Appendix D).

Reliability and Validity

The ecological validity of the research study was ensured through the following guidelines set forth by Czaja and Sharit (2003) which state that real-world tasks must be performed within the problem domain, specific tasks must be clarified, the task results must be analyzed after data is collected, and the task should be investigated in the research environment by the use of a simulation or model. The TAM developed by Davis (1989) has historically demonstrated success in assisting in the determination of what causes people to accept or reject information technology, but is much older than newer models accepted in the research community including others with proposed modifications that are tailored to specific demographics or technologies such as mobile banking and healthcare (Lee, Xiong, & Hu, 2012; Lule & Waema, 2012; Morgan-Thomas & Veloutsou, 2013; Surendran, 2012; Venkatesh, Morris, Davis, & Davis, 2003). The UTAUT model, which has been developed by the expansion, reviewing, and consolidation of the constructs of eight previous technology acceptance models (TAMs), has built upon recent research to form a well-established methodological approach in comparison to older models. This modern model provides the most accurate results in explaining the behavioral intentions and use behavior differences among senior adults in

this dissertation research study (Davis, 1989; Venkatesh, Morris, Davis, & Davis; Niehaves & Plattfaut, 2014). Furthermore, past research has shown that in order to better understand SNS adoption and usage, it is important for the researcher to thoroughly examine literature on different TAMs (Gangadharbatla, 2009). Identifying possible factors of why seniors do not use SNSs provided useful and relevant data to assist in the inclusion of functionality, characteristics, and features that are more likely to be adopted by senior adults in future iterations of SNSs.

Data Analysis Strategies

Concluding the data collection period, recorded data were exported via the researcher's Survey Monkey Pro account into data formats that are usable to perform analysis using other statistics software. The data were first analyzed in regard to sample demographics, missing values, and non-responses. Total number of responses (N), minimum values (MIN), maximum values (MAX), mean, and standard deviation (SD) were analyzed from the demographic data in relation to gender using the statistical software application SPSS. Collected data were limited to that of senior adults age 65 or older as to address the research hypotheses of the dissertation study. Response rates were documented in the form of number of complete numerical responses and total percentage of completion based off the total sample population sizes. Percentages of female versus male respondents were also documented during the analysis.

Means and standard deviation of age, performance expectancy, effort expectancy, social influence, and facilitating conditions exogenous variables were reported alongside the behavioral intention and actual use behavior endogenous variables from the

Simplified UTAUT model. A series of linear regressions and moderation analyses were used in the discovery and further examination of significant relationships within the model to identify if each research hypotheses were supported as a result of the research. Cronbach's alpha measure of internal consistency for all sets of scaled items was analyzed to indicate the value ranges and to identify any confirmatory research. Linear regression analysis was performed for behavioral intention and use behavior to test if there was a high or low correlation indicating either a strong or insufficient influence between the two endogenous variables of the UTAUT model applied in this study.

Performance expectancy, effort expectancy, or social influence were each separately explored in relation to a senior adult's behavioral intention to use SNSs through testing the moderating effects of gender within their collective relationships. Moderated multiple regression analyses, such as the general multiple regression approach, are consistently one of the top five most popular data-analysis techniques found in the literature over the last 30 years (Aguinis, Pierce, Bosco, & Muslin, 2009). Best-practice recommendations outlined by Aguinis and Gottfredson (2010) were used to appropriately provide a better understanding of the change in strength and direction of variables involved using moderated multiple regression analyses as the primary approach for testing hypothesis about interaction effects. The moderation analysis used in this research study conformed to these best-practice recommendations for estimating interaction effects in addition to further validating and determining the significance of evidence in support of a moderating relationship contingent upon gender within a multiple linear regression analysis (Aguinis & Gottfredson, 2010; Baron & Kenny, 1986).

Steps to establish empirical support for the presence of an interaction effect were implemented before any claim to a moderating effect could occur in any of the tested relationships for hypotheses 6-8. The following essential steps were completed in the implementation of a moderated multiple regression analysis for each hypothesis 6-8 respectively:

- A new variable, known as the product term between the criterion variable and the predictor variable, was created for each hypothesis respectively.
- The F distribution statistic (F), cumulative probability, (t) test statistics, and the probability level (p) to determine whether there is empirical support for the presence of an interaction effect.
- Report the statistical significance or statistical non-significance of the interaction term.

If statistical significance does not exist between the moderator variable and the interaction term, there is no moderation and consequently no further interpretation should be made since the interpretation would not be valid (Baron & Kenny, 1986; James & Brett, 1984; Judd & Kenny, 1981).

The data analysis methods applied in this dissertation study employed methods consistently found or recommended among literature from other UTAUT studies and the unique insight gained by exploring the moderating effect of gender among the senior adult population further broadens the implications of this research. Benckendorff, Sheldon, and Fesenmaier (2014) observed the persistence of continued demand for additional research to examine the moderating effects of gender, age, experience, and

voluntariness of use in the strength of the relation they share between a corresponding predictor and an outcome variable within the UTAUT model—the analysis and findings of this research can be found in Chapter 4.

Resources

Resources needed to accomplish the goal of the dissertation included a reasonably attained list of requisites. All costs of acquiring any of the following stated resources were provided at the sole cost of the researcher. First and foremost, the researcher needed a mobile laptop computer and unimpeded access to the Internet, which had already been acquired, to collect and sort any survey data received from participants responding to the self-administered electronic survey during all phases of the research study. Software and web application resources included Microsoft Word, which was used to draft all surveys, and a paid monthly subscription to SurveyMonkey Select Plan to collect and record online survey data from participants. The survey was later self-administered via email, therefore no travel arrangements or on-site conference, classroom, or computer labs were necessary for either the participants or the researcher. The geographical location of the study being Nashville, Tennessee was selected because the researcher is both from this location and has access to any required facilities, if necessary, and more importantly access to senior adult participants for this study. Therefore, there was not any added expense to the researcher, no need to provide computer labs, and no need to be present during the administration of the self-administered survey for any of the population groups.

Human resources necessary for the study were limited to the researcher. The researcher developed the survey questions, created the self-administered online survey, delivered it electronically to each of the sites, and later collected, analyzed, and reported on the findings of the research data.

Summary

Following the restatement of the dissertation goal and review of all research hypotheses of the study derived from the UTAUT model, Chapter 3 reviewed the current literature surrounding the dissertation study. Differences and the significance of similar research models were discussed as this chapter presented the Simplified UTAUT model and substantiated its adaption from Venkatesh et al.'s (2003) original UTAUT model for more accurate use in the context of this dissertation.

Prior to conducting any research or distributing the online self-administered survey to human subjects within the three population groups with a combined total of 14,000 prospective survey respondents of various age groups, explicit permission was obtained from the homogeneous distributions of senior adults 65 years of age or older across the Southern states of the United States of America. The chapter was concluded by discussing the planned implementation of the research study and outlined all data analysis strategies in preparation for the forthcoming presentation of findings and data analysis. Approval to proceed with the execution of the pilot study and administration of the online surveys was obtained through Nova Southeastern University's Institutional Review Board for Research with Human Subjects.

Chapter 4

Results

Introduction

The purpose of this study was to investigate and identify factors that influence behavioral intention and use behavior of major online social networking websites among senior adults using the Unified Theory of Acceptance and Use of Technology (UTAUT) model. This chapter presents the results of the data analyses where descriptive statistics were examined to describe the trends in the nominal and continuous level variables. Cronbach's alpha was calculated for the scales to assess reliability. A series of linear regression and moderation analyses were used to examine the relationships and address each of the research hypotheses by applying similar data analysis methods utilized consistently in other previous UTAUT studies also adhering to the research methods and analysis from the original Venkatesh et al. (2003; 2012) study (Benckendorff, Sheldon, and Fesenmaier, 2014). Statistical significance was evaluated at the conventional level, $\alpha = .05$.

Execution of the Pilot

The pilot study was conducted as a preventative measure to ensure the online survey performed as expected and there were no unforeseen technology problems or comprehension issues related to any survey questions. Five volunteer senior adults were asked by the researcher to participate in the pilot study over a period of seven days. Their results were not included in the data analyses nor were they asked to participate in the actual study. These measures were taken to ensure the highest level of integrity for the

data analysis since the pilot study participants had already seen the questions during the pilot study. The five participants revealed that the anticipated timeframe of survey completion was five minutes instead of the predicted fifteen minutes. The Introductory E-mail Requesting Participation in Survey (see Appendix F) and the Online Survey Instructions and Participation Letter (see Appendix G) were updated to reflect the new difference in time. Verbal discussion with the five pilot study participants also revealed that a mobile version of the survey was necessary as it was highly likely that many of the survey recipients would be using smartphones to access the survey link and the current survey was not properly formatted to work on mobile devices. The survey was updated to work on mobile devices, independent of the screen size or resolution of the device used to collect data. The new mobile-friendly version was a significant improvement over the original survey collector that was previously designed to work best with desktop computers.

Analysis and Findings

Pre-Analysis Data Screen. Survey responses were collected over a 14-day period from a total of 129 participants within three population groups in the Southern states of the United States of America. A total of 24 participants were removed due to participants not meeting the age inclusion criteria and for incomplete responses to the survey instrument. The final sample consisted of 105 participants. All three of the population groups from the Alabama South District Church of the Nazarene, South Coastal District of the Wesleyan Church, and Trevecca Nazarene University met the minimum inclusion criteria of at least 15 male and 15 female senior adult participants from each sample.

Descriptive Statistics.

Frequencies and percentages. The distribution of genders was approximately equal between males ($n = 51$, 48.6%) and females ($n = 54$, 51.4%). Most participants in the sample identified themselves as retired ($n = 45$, 42.9%). However, many participants still worked full-time ($n = 28$, 26.7%) or part-time ($n = 23$, 21.9%). Among the individuals who were employed, most did not use social networking websites for their job ($n = 49$, 46.7%). Frequencies and percentages are presented in Table 4.

Table 4

Frequency Table for Demographic Variables

Variable	<i>n</i>	%
Gender		
Male	51	48.6
Female	54	51.4
Job situation		
Work full-time (40 or more hours per week)	28	26.7
Work part-time	23	21.9
Currently seeking employment	1	1.0
Retired	45	42.9
Volunteer	8	7.6
Do you use social networking websites for job?		
Yes	38	36.2
No	49	46.7
No response	18	17.1

Note. Due to rounding errors, percentages may not equal 100%.

Continuous variables. Descriptive statistics were used to explore the trends in the continuous level variables. The range of the variables is presented through minimum and maximum values, and summary statistics are presented through means (*M*) and standard deviations (*SD*). The skewness and kurtosis values are also included and met the criteria for normality. According to Kline (2010), data meet the normality assumption if skew is

between -2.0 and 2.0, and kurtosis is between -7.0 and 7.0. Table 5 presents the findings of the descriptive statistics. Table 6 presents the descriptive statistics when examined by gender.

Table 5

Summary Statistics Table for Continuous Variables

Variable	Min.	Max.	<i>M</i>	<i>SD</i>	Skew	Kurtosis
Age	65.00	98.00	73.64	8.04	1.28	1.05
Performance expectancy	1.00	7.00	4.38	1.71	-0.37	-1.00
Effort expectancy	1.00	7.00	4.04	1.91	-0.34	-1.18
Social influence	1.33	7.00	5.64	1.30	-1.40	1.72
Facilitating conditions	1.75	6.00	4.23	1.17	-0.30	-1.00
Behavioral intentions	1.00	7.00	5.02	1.52	-1.15	0.91
Actual usage behavior	0.00	5.00	3.23	1.55	-0.46	-0.83

Table 6

Summary Statistics Table for Continuous Variables by Gender

Variable	Males		Females	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Age	72.28	6.65	75.08	9.14
Performance expectancy	3.11	1.65	3.35	1.44
Effort expectancy	4.19	1.77	4.59	1.63
Social influence	4.05	2.00	4.03	1.82
Facilitating conditions	5.43	1.44	5.87	1.10
Behavioral intentions	4.20	1.13	4.27	1.22
Actual usage behavior	4.80	1.65	5.25	1.34

Reliability. Cronbach's alpha values were examined for the series of items making each scale. The value of the coefficients was interpreted through incremental thresholds described by George and Mallery (2016), in which $\alpha \geq .9$ Excellent, $\alpha \geq .8$

Good, $\alpha \geq .7$ Acceptable, $\alpha \geq .6$ Questionable, $\alpha \geq .5$ Poor, and $\alpha < .5$ Unacceptable. The results for facilitating conditions had poor reliability. The results for the remaining five scales met the acceptable threshold for reliability. The Cronbach's alpha statistics are reported in Table 7.

Table 7

Cronbach's Alpha Reliability Statistics for Scales

Scale	No. of Items	α
Performance expectancy	3	.828
Effort expectancy	4	.970
Social influence	3	.818
Facilitating conditions	4	.533
Behavioral intentions	3	.935

Research Hypothesis 1 (H1): A senior adult's perceived performance expectancy positively influences the senior's behavioral intention toward using a social networking website.

A linear regression was conducted to examine the predictive relationship between perceived performance expectancy and senior's behavioral intention toward using a social networking website. A linear regression is an appropriate statistical analysis when testing the predictive relationship between an independent variable and a continuous criterion variable (Tabachnick & Fidell, 2013). In this analysis, the predictor variable corresponded to performance expectancy. The criterion variable corresponded to behavioral intention toward using a social networking website.

Prior to the regression analysis, the assumptions of linearity, normality, and homoscedasticity were tested for the predictor. Linearity was tested through a scatterplot

between perceived performance expectancy in relationship to behavioral intention. There appeared to be a positive association between perceived performance expectancy and behavioral intention (see Figure 7). The normality assumption was tested through visual inspection of a normal P-P plot between the expected cumulative probability and the observed cumulative probability. The raw data closely followed the normality trend line, suggesting that the assumption of normality was met (see Figure 8). Homoscedasticity was visually tested through inspection of a residuals scatterplot, and the assumption was met due to there not being a recurring pattern in the data (see Figure 9).

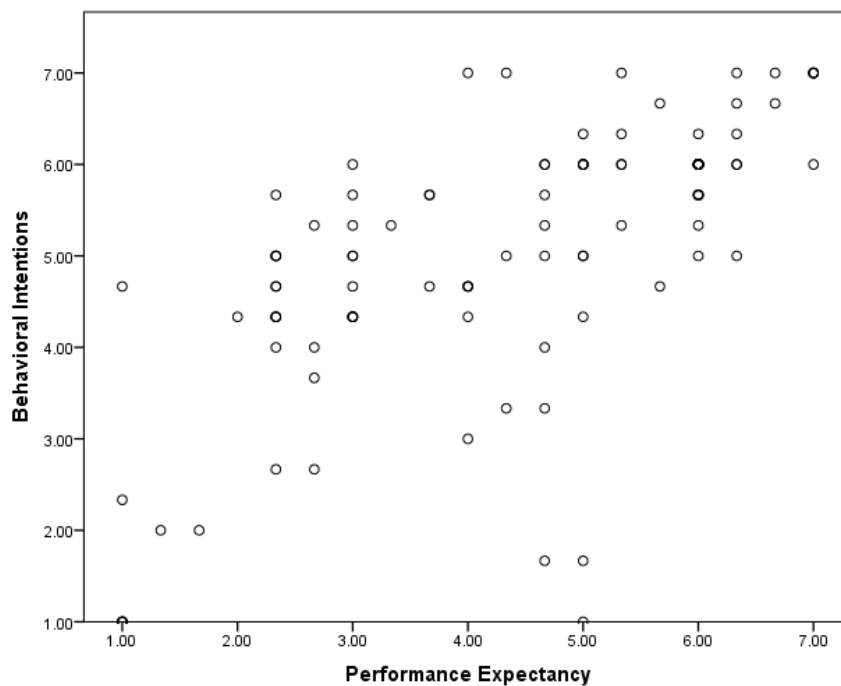


Figure 7. Scatterplot Between Perceived Performance Expectancy and Seniors' Behavioral Intention Toward Using a Social Networking Website.

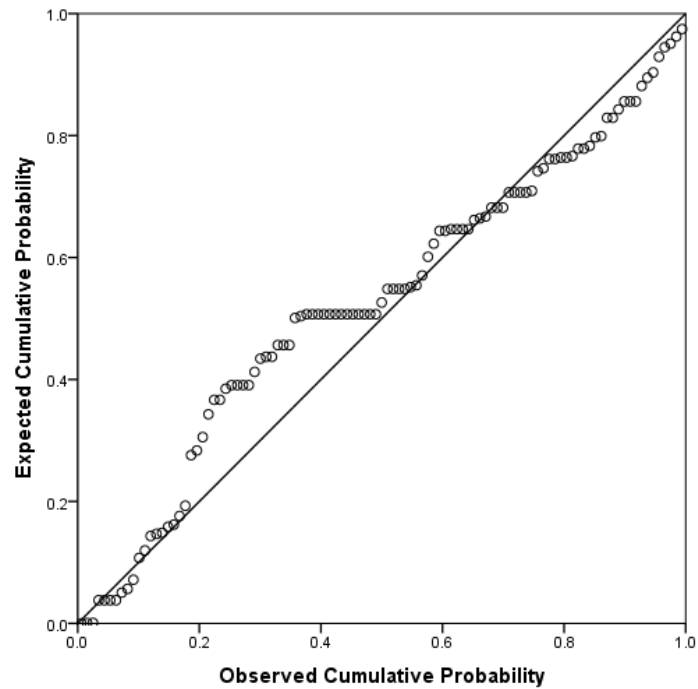


Figure 8. Normal P-P Plot for Perceived Performance Expectancy Predicting Seniors' Behavioral Intention Toward Using a Social Networking Website.

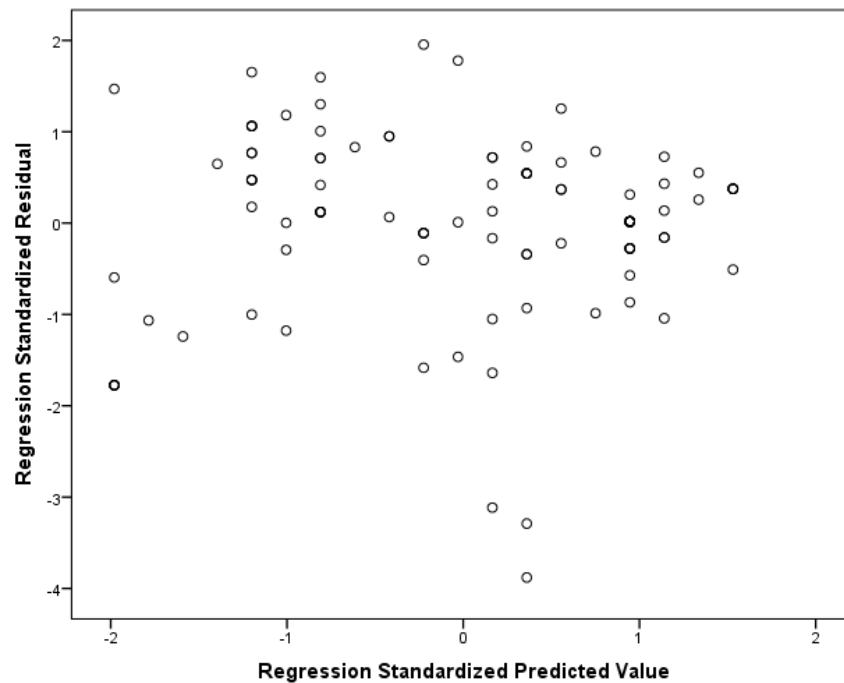


Figure 9. Standardized Predicted Values Versus Standardized Residuals for the Regression of Performance Expectancy on Seniors' Behavioral Intention Toward Using a Social Networking Website.

Results of the overall model of the linear regression were statistically significant, [$F(1, 103) = 84.12, p < .001, R^2 = .450$] for the predictive relationship tested between the independent variable and the continuous criterion variable suggesting that there was a significant relationship between performance expectancy and a senior's behavioral intention toward using a social networking website. The R^2 values suggests that approximately 45.0% of the variance in behavioral intention toward using a social networking website can be explained by performance expectancy. Performance expectancy ($t = 9.17, p < .001$) was a significant predictor in the model, suggesting that as performance expectancy scores increase by one unit, scores for senior's behavioral intention toward using a social networking website increased by 0.60 units. The results of the linear regression are presented in Table 8.

Table 8

Results for Regression with Perceived Performance Expectancy Predicting Seniors' Behavioral Intention toward Using a Social Networking Website

Source	<i>B</i>	<i>SE</i>	β	<i>t</i>	<i>p</i>
Performance expectancy	0.60	0.07	.67	9.17	<.001

Note. $F(1, 103) = 84.12, p < .001, R^2 = .450$.

Research Hypothesis 2 (H2): A senior adult's perceived effort expectancy positively influences the senior's behavioral intention toward using a social networking website.

A linear regression was conducted to examine the predictive relationship between perceived effort expectancy and senior's behavioral intention toward using a social networking website. A linear regression is an appropriate statistical analysis when testing

the predictive relationship between an independent variable and a continuous criterion variable (Tabachnick & Fidell, 2013). In this analysis, the predictor variable corresponded to effort expectancy. The criterion variable corresponded to behavioral intention toward using a social networking website.

Prior to the regression analysis, the assumptions of linearity, normality, and homoscedasticity were tested for the predictor. Linearity was tested through a scatterplot between perceived effort expectancy in relationship to behavioral intention. There appeared to be a positive association between perceived effort expectancy and behavioral intention (see Figure 10). The normality assumption was tested through visual inspection of a normal P-P plot between the expected cumulative probability and the observed cumulative probability. The raw data closely followed the normality trend line, suggesting that the assumption of normality was met (see Figure 11). Homoscedasticity was visually tested through inspection of a residuals scatterplot, and the assumption was met due to there not being a recurring pattern in the data (see Figure 12).

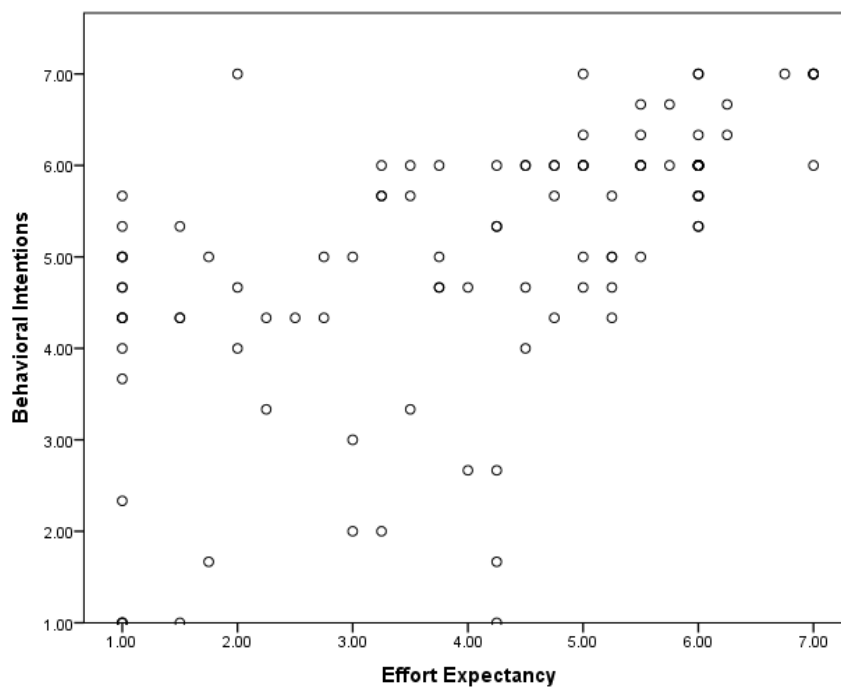


Figure 10. Scatterplot Between Perceived Effort Expectancy and Seniors' Behavioral Intention Toward Using a Social Networking Website.

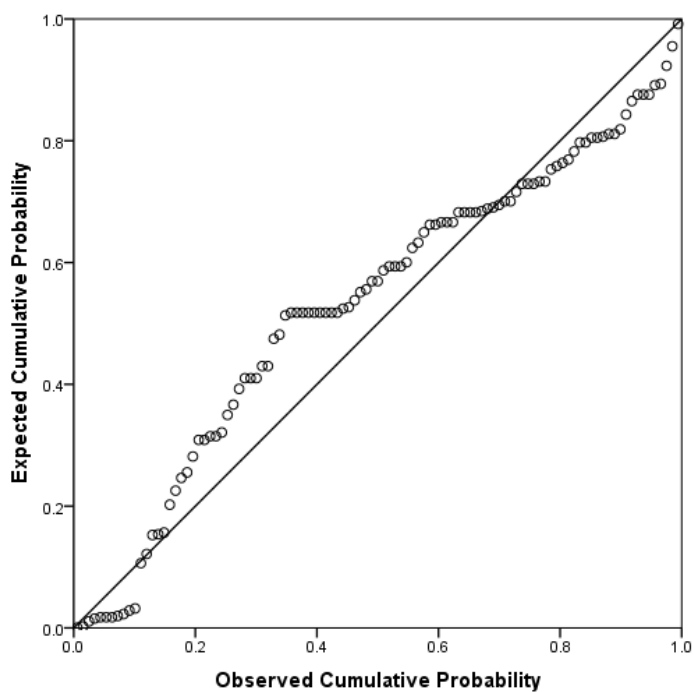


Figure 11. Normal P-P Plot for Perceived Effort Expectancy Predicting Seniors' Behavioral Intention Toward Using a Social Networking Website.

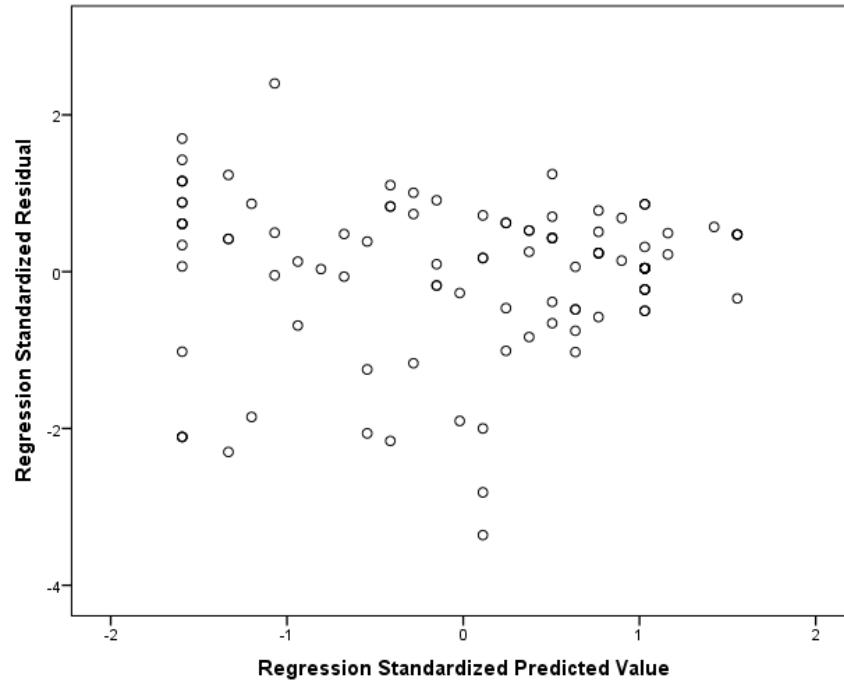


Figure 12. Standardized Predicted Values Versus Standardized Residuals for the Regression of Effort Expectancy on Seniors' Behavioral Intention Toward Using a Social Networking Website.

Results of the overall model of the linear regression were statistically significant, [$F(1, 103) = 55.98, p < .001, R^2 = .352$] for the predictive relationship tested between the independent variable and the continuous criterion variable suggesting that there was a significant relationship between effort expectancy and a senior's behavioral intention toward using a social networking website. The R^2 values suggests that approximately 35.2% of the variance in behavioral intention toward using a social networking website can be explained by effort expectancy. Effort expectancy ($t = 7.48, p < .001$) was a significant predictor in the model, suggesting that as effort expectancy scores increase by one unit, scores for senior's behavioral intention toward using a social networking website increased by 0.47 units. The results of the linear regression are presented in Table 9.

Table 9

Results for Regression with Effort Expectancy Predicting Seniors' Behavioral Intention toward Using a Social Networking Website

Source	<i>B</i>	<i>SE</i>	β	<i>t</i>	<i>p</i>
Effort expectancy	0.47	0.06	.59	7.48	<.001

Note. $F(1, 103) = 55.98, p < .001, R^2 = .352$.

Research Hypothesis 3 (H3): A senior adult's perceived social influence positively influences the senior's behavioral intention toward using a social networking website.

A linear regression was conducted to examine the predictive relationship between perceived social influence and senior's behavioral intention toward using a social networking website. A linear regression is an appropriate statistical analysis when testing the predictive relationship between an independent variable and a continuous criterion variable (Tabachnick & Fidell, 2013). In this analysis, the predictor variable corresponded to social influence. The criterion variable corresponded to behavioral intention toward using a social networking website.

Prior to the regression analysis, the assumptions of linearity, normality, and homoscedasticity were tested for the predictor. Linearity was tested through a scatterplot between perceived social influence in relationship to behavioral intention. There appeared to be a positive association between perceived social influence and behavioral intention (see Figure 13). The normality assumption was tested through visual inspection of a normal P-P plot between the expected cumulative probability and the observed cumulative probability. The raw data closely followed the normality trend line, suggesting that the assumption of normality was met (see Figure 14). Homoscedasticity

was visually tested through inspection of a residuals scatterplot, and the assumption was met due to there not being a recurring pattern in the data (see Figure 15).

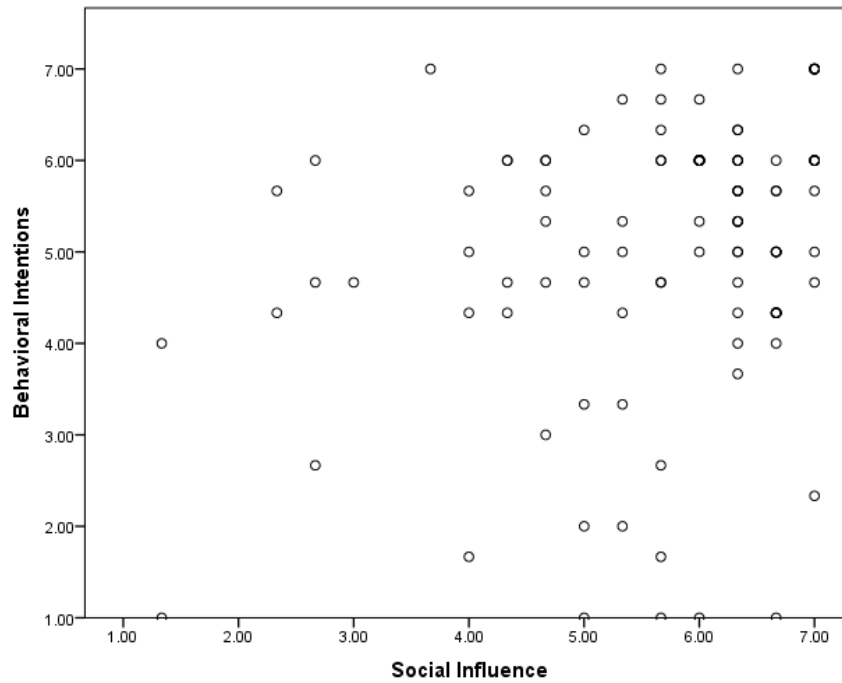


Figure 13. Scatterplot Between Social Influence and Seniors' Behavioral Intention Toward Using a Social Networking Website.

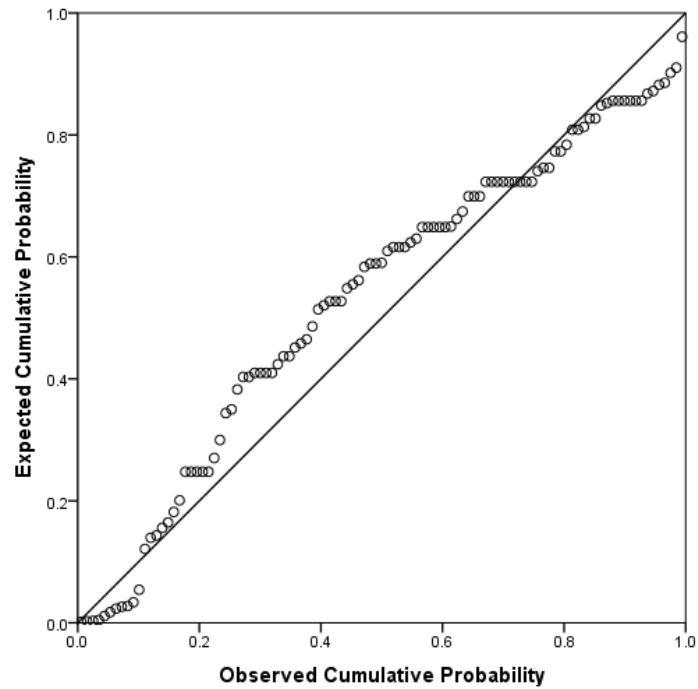


Figure 14. Normal P-P Plot for Social Influence Predicting Seniors' Behavioral Intention Toward Using a Social Networking Website.

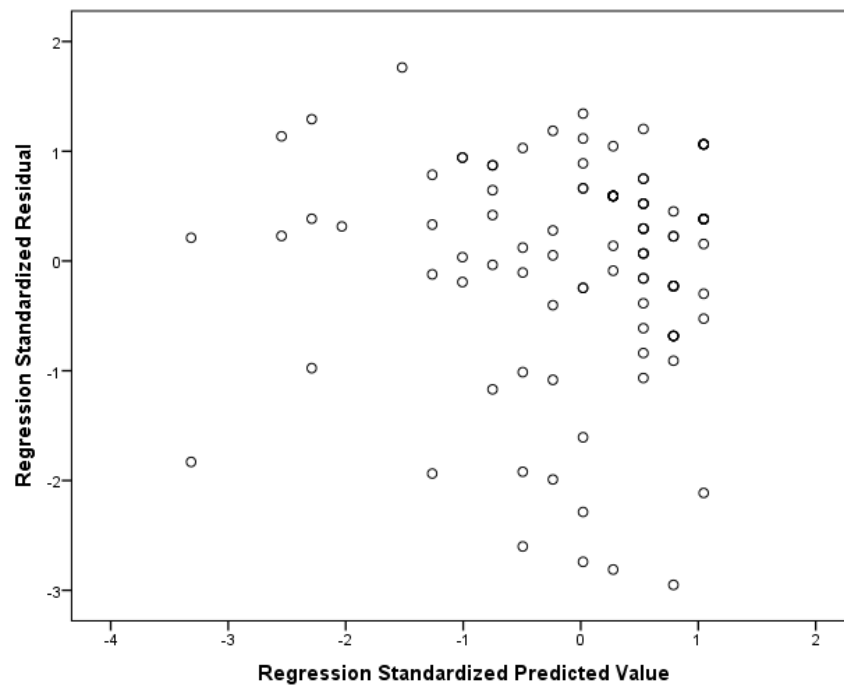


Figure 15. Standardized Predicted Values Versus Standardized Residuals for the Regression of Social Influence on Seniors' Behavioral Intention Toward Using a Social Networking Website.

Results of the overall model of the linear regression were statistically significant, [$F(1, 103) = 7.74, p = .006, R^2 = .070$] for the predictive relationship tested between the independent variable and the continuous criterion variable suggesting that there was a significant relationship between social influence and a senior's behavioral intention toward using a social networking website. The R^2 values suggests that approximately 7.0% of the variance in behavioral intention toward using a social networking website can be explained by social influence. Social influence ($t = 2.78, p = .006$) was a significant predictor in the model, suggesting that as social influence scores increase by one unit, scores for senior's behavioral intention toward using a social networking website increased by 0.31 units. The results of the linear regression are presented in Table 10.

Table 10

Results for Regression with Social Influence Predicting Seniors' Behavioral Intention toward Using a Social Networking Website

Source	<i>B</i>	<i>SE</i>	β	<i>t</i>	<i>p</i>
Social influence	0.31	0.11	.26	2.78	.006

Note. $F(1, 103) = 7.74, p = .006, R^2 = .070$.

Research Hypothesis 4 (H4): A senior adult's perception of facilitating conditions positively influences the senior's use behavior for a social networking website.

A simple linear regression was conducted to examine the predictive relationship between perceived facilitating conditions and senior's use behavior for using a social networking website. In this analysis, the predictor variable corresponded to facilitating conditions. The criterion variable corresponded to senior's use behavior for a social networking website.

Prior to the simple linear regression analysis, the assumptions of linearity, normality, and homoscedasticity were tested. Linearity was tested through a scatterplot between facilitating conditions and senior's use behavior. There appeared to be an association between facilitating conditions and senior's use behavior (see Figure 16). The normality assumption was tested through visual inspection of a normal P-P plot between the expected cumulative probability and the observed cumulative probability. The raw data closely followed the normality trend line, suggesting that the assumption of normality was met (see Figure 17). Homoscedasticity was visually tested through inspection of a residuals scatterplot, and the assumption was met due to there not being a recurring pattern in the data (see Figure 18).

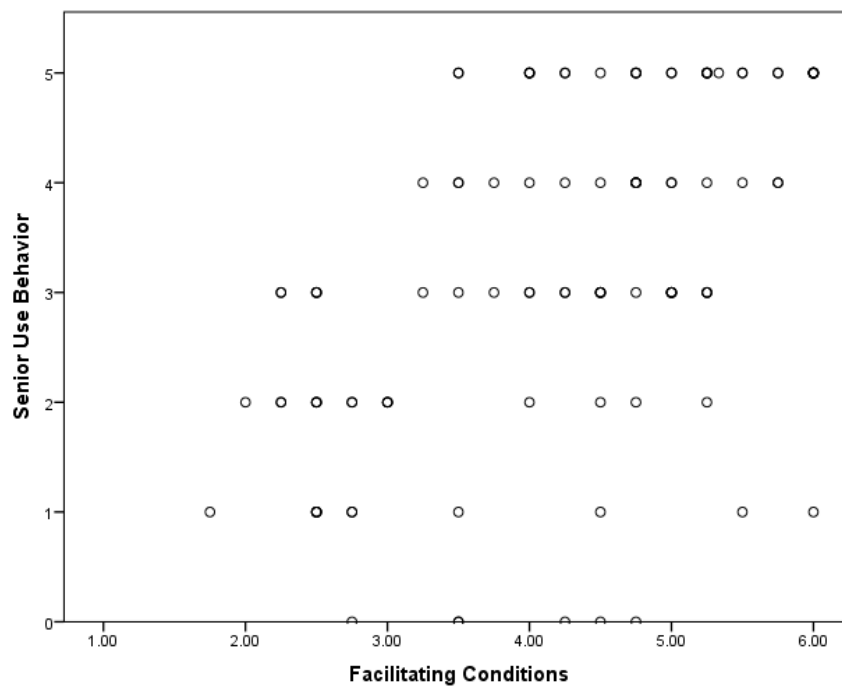


Figure 16. Scatterplot Between Facilitating Conditions and Seniors' Use Behavior for a Social Networking Website.

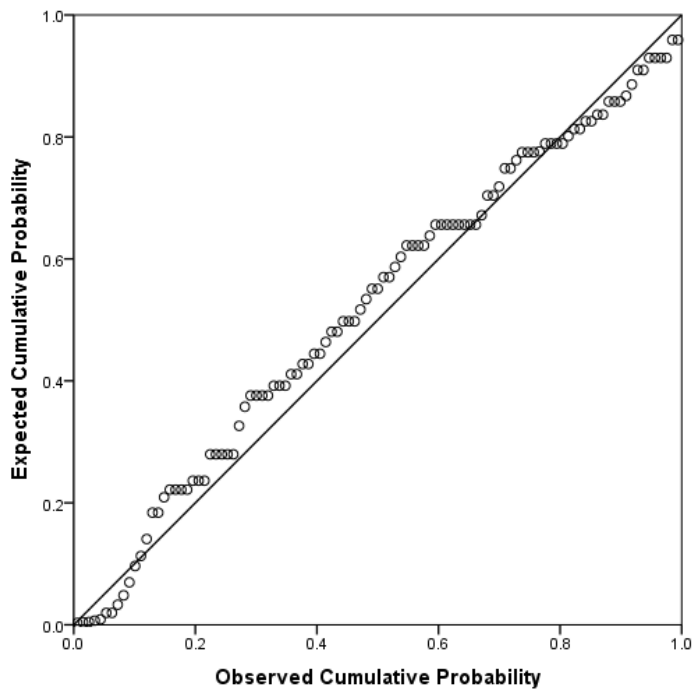


Figure 17. Normal P-P Plot for Facilitating Conditions Predicting Seniors' Use Behavior for a Social Networking Website.

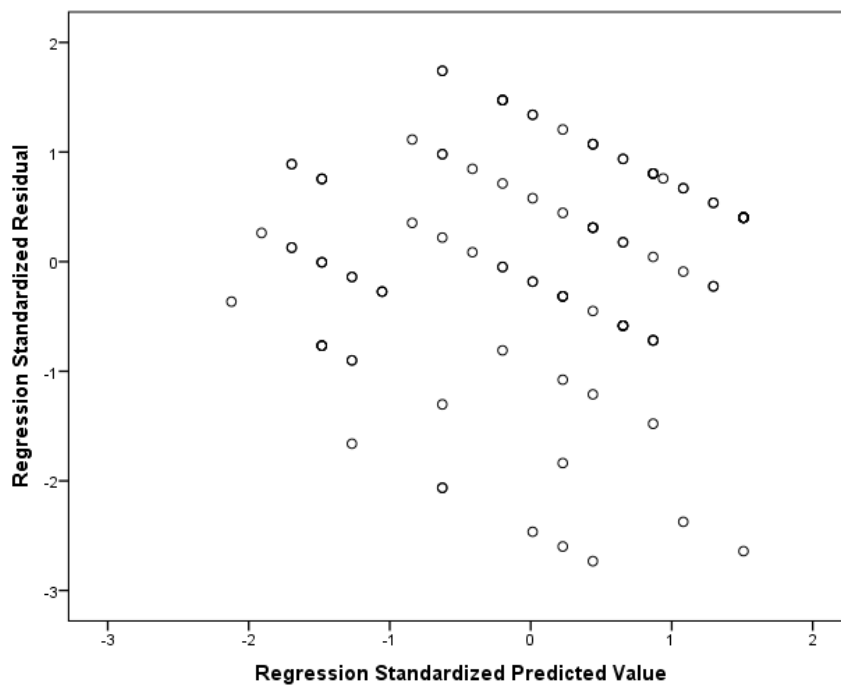


Figure 18. Standardized Predicted Values Versus Standardized Residuals for the Regression on Seniors' Use Behavior for a Social Networking Website.

Results of the overall model of the simple linear regression were statistically significant, [$F(1, 103) = 40.88, p < .001, R^2 = .284$], suggesting that there was a significant relationship between facilitating conditions and senior's use behavior for a social networking website. The R^2 value suggests that approximately 28.4% of the variance in senior's use behavior for a social networking website can be explained by facilitating conditions. Facilitating conditions ($t = 6.39, p < .001$) was a significant predictor in the model, suggesting that as facilitating conditions scores increase by one unit, scores for senior's use behavior for a social networking website increased by 0.70 units. The results of the simple linear regression are presented in Table 11.

Table 11

Results for Regression with Facilitating Conditions Predicting Seniors' Use Behavior for a Social Networking Website

Source	<i>B</i>	<i>SE</i>	β	<i>t</i>	<i>p</i>
Facilitating conditions	0.70	0.11	.53	6.39	<.001

Note. $F(1, 103) = 40.88, p < .001, R^2 = .284$.

Research Hypothesis 5 (H5): A senior adult's behavioral intention to use a social networking website positively influences the senior's use behavior for a social networking website.

A simple linear regression was conducted to examine the predictive relationship between behavioral intentions and senior's use behavior for using a social networking website. In this analysis, the predictor variable corresponded to behavioral intentions. The criterion variable corresponded to senior's use behavior for a social networking website.

Prior to the simple linear regression analysis, the assumptions of linearity, normality, and homoscedasticity were tested. Linearity was tested through a scatterplot between senior's behavioral intention and senior's use behavior. There appeared to be an association between senior's behavioral intention and senior's use behavior (see Figure 19). The normality assumption was tested through visual inspection of a normal P-P plot between the expected cumulative probability and the observed cumulative probability. The raw data closely followed the normality trend line, suggesting that the assumption of normality was met (see Figure 20). Homoscedasticity was visually tested through inspection of a residuals scatterplot, and the assumption was met due to there not being a recurring pattern in the data (see Figure 21).

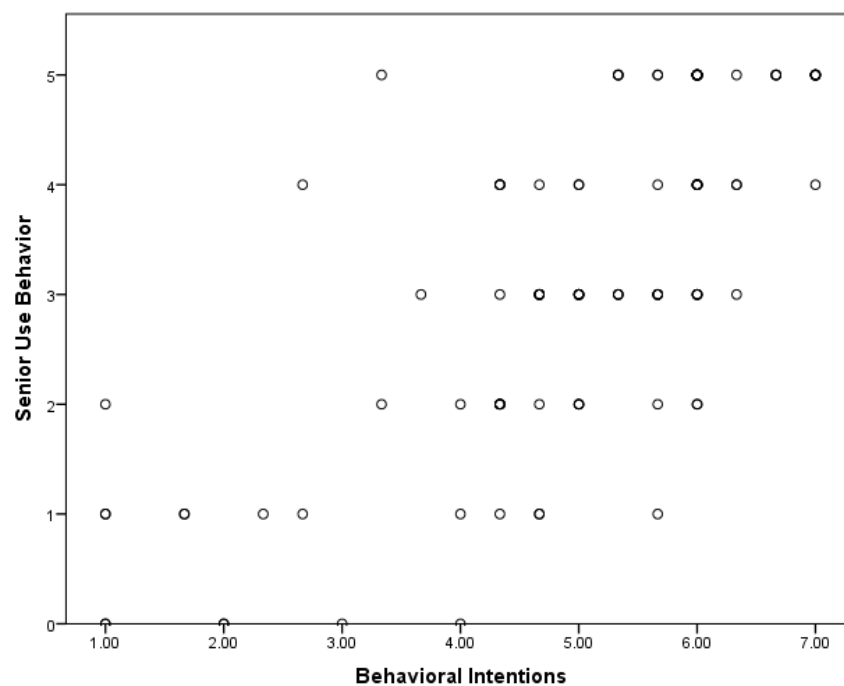


Figure 19. Scatterplot Between Seniors' Behavioral Intention Toward Using a Social Networking Website and Seniors' Use Behavior for a Social Networking Website.

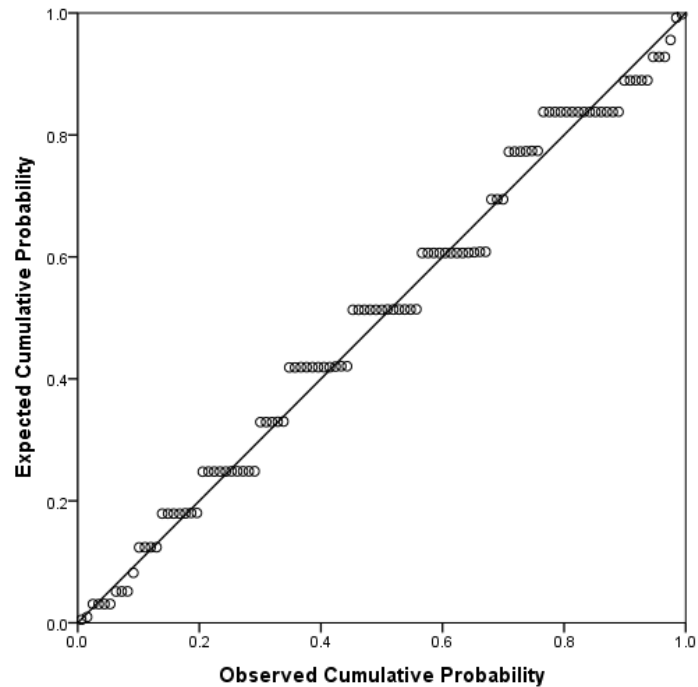


Figure 20. Normal P-P Plot for Seniors' Behavioral Intention Toward Using a Social Networking Website Predicting Seniors' Use Behavior for a Social Networking Website.

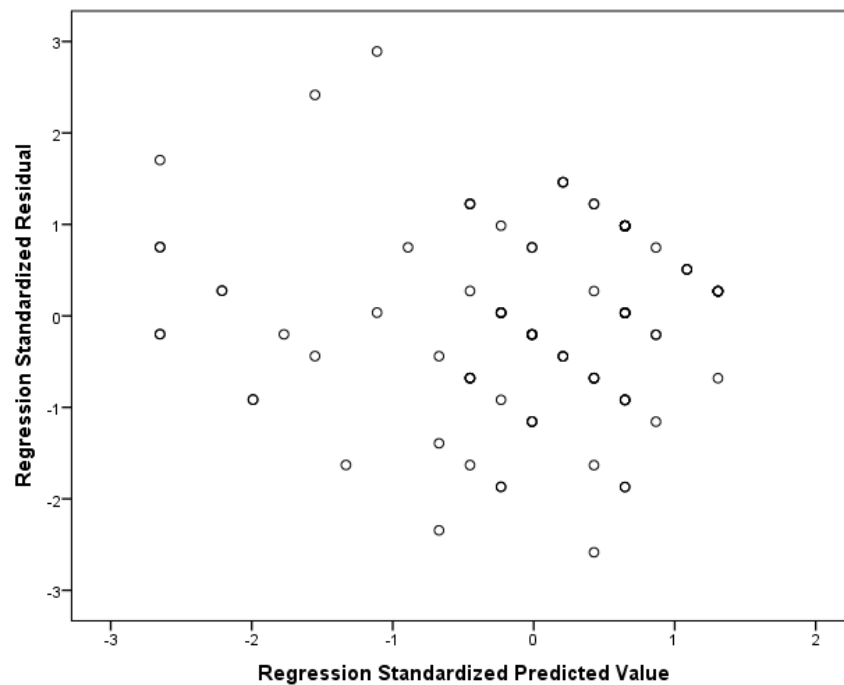


Figure 21. Standardized Predicted Values Versus Standardized Residuals for the Regression on Seniors' Use Behavior for a Social Networking Website.

Results of the overall model of the simple linear regression were statistically significant, [$F(1, 103) = 122.17, p < .001, R^2 = .543$], suggesting that there was a significant relationship between behavioral intentions and senior's use behavior for a social networking website. The R^2 value suggests that approximately 54.3% of the variance in senior's use behavior for a social networking website can be explained by behavioral intentions. Behavioral intentions conditions ($t = 11.05, p < .001$) was a significant predictor in the model, suggesting that as behavioral intentions scores increase by one unit, scores for senior's use behavior for a social networking website increased by 0.75 units. The results of the simple linear regression are presented in Table 12.

Table 12

Results for Regression with Behavioral Intentions Predicting Seniors' Use Behavior for a Social Networking Website

Source	<i>B</i>	<i>SE</i>	β	<i>t</i>	<i>p</i>
Behavioral intentions	0.75	0.07	.74	11.05	<.001

Note. $F(1, 103) = 122.17, p < .001, R^2 = .543$.

Research Hypothesis 6 (H6): The influence of performance expectancy on a senior adult's behavioral intention toward using a social networking website will be moderated by gender.

A moderation analysis was conducted testing whether the influence of performance expectancy on a senior adult's behavioral intention toward using a social networking website is moderated by gender (Aguinis & Gottfredson, 2010; Baron & Kenny, 1986). The analysis conformed to best-practice recommendations for estimating interaction effects, that were outlined previously in the Data Analysis Strategies section

of Chapter 3, to validate and determine the significance of evidence for a moderating relationship contingent upon gender within a multiple linear regression analysis. In this analysis, the predictor variable corresponded to performance expectancy and the moderating variable corresponded to gender. An interaction term was created between performance expectancy*gender. The criterion variable corresponded to behavioral intention.

Prior to the multiple linear regression analysis, the assumptions of normality, homoscedasticity, and absence of multicollinearity were tested to establish the validity of conclusions drawn from the statistical tests; each assumption was satisfied prior to proceeding with the moderation analysis. The normality assumption was tested through visual inspection of a normal P-P plot between the expected cumulative probability and the observed cumulative probability. The raw data closely followed the normality trend line, suggesting that the assumption of normality was met (see Figure 22).

Homoscedasticity was visually tested through inspection of a residuals scatterplot, and the assumption was met due to there not being a recurring pattern in the data (see Figure 23). The absence of multicollinearity assumption was tested by examination of variance inflation factors (VIFs). VIF values below 10 suggested that the absence of multicollinearity assumption was met.

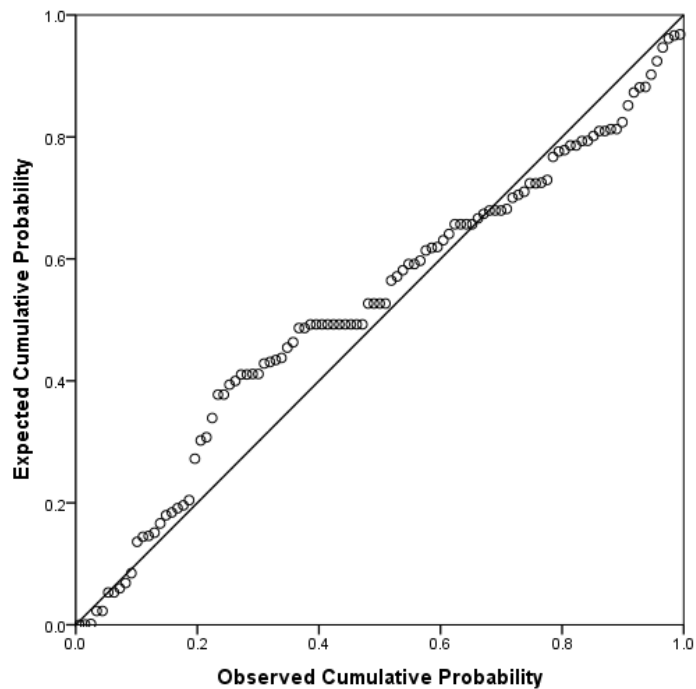


Figure 22. Normal P-P Plot for Performance Expectancy, Gender, and Performance Expectancy*Gender Predicting Behavioral Intention.

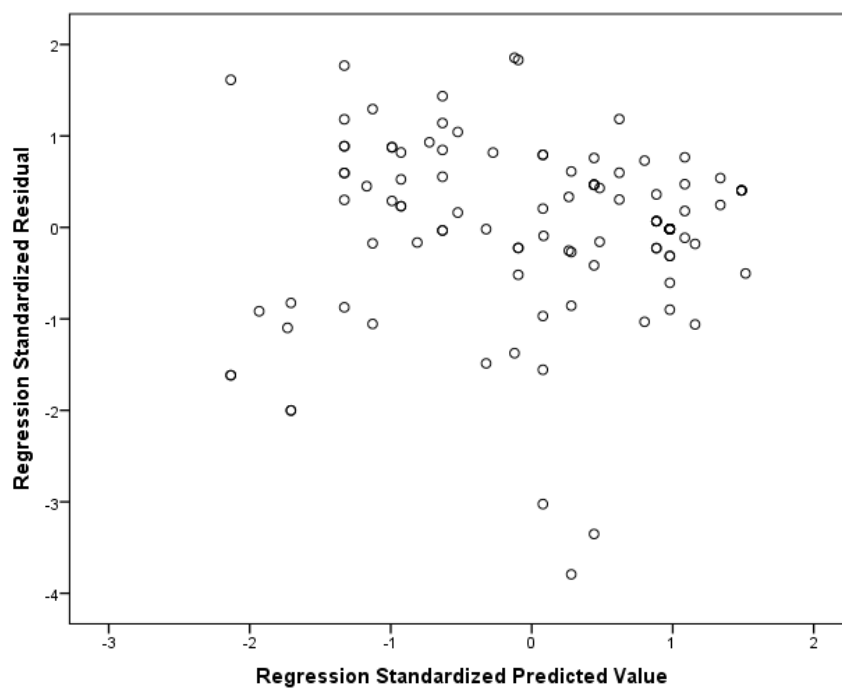


Figure 23. Standardized Predicted Values Versus Standardized Residuals for the Regression on Behavioral Intention.

Results of the overall model of the multiple linear regression were statistically significant, [$F(3, 101) = 28.17, p < .001, R^2 = .456$], suggesting a preliminary significant collective relationship between performance expectancy, gender, performance expectancy*gender, and behavioral intentions. The R^2 value suggests that approximately 45.6% of the variance in behavioral intentions can be explained by the predictors and interaction term.

The moderation analysis first showed that performance expectancy correlated with a senior adult's behavioral intentions to use SNSs and that it was also a significant predictor variable; however, further examination of the moderation analysis concluded that gender and the interaction term were not found to be significant in the model establishing that gender does not have a moderating effect in the relationship between performance expectancy and a senior adult's behavioral intention to use a social networking website. The absence of a significant moderation effect in the model asserts that no further interpretation should be made in such a scenario since the interpretation would not be valid (Baron & Kenny, 1986; James & Brett, 1984; Judd & Kenny, 1981). The results of the multiple linear regression are presented in Table 13.

Table 13

*Results for Regression with Performance Expectancy, Gender, and Performance Expectancy*Gender Predicting Behavioral Intentions*

Source	<i>B</i>	<i>SE</i>	β	<i>t</i>	<i>p</i>	VIF
Performance expectancy	0.55	0.10	.62	5.59	<.001	2.28
Gender	-0.21	0.22	-.07	-0.93	.356	1.02
Performance expectancy*Gender	0.07	0.13	.06	0.51	.609	2.26

Note. $F(3, 101) = 28.17, p < .001, R^2 = .456$.

Research Hypothesis 7 (H7): The influence of effort expectancy on a senior adult's behavioral intention toward using a social networking website will be moderated by gender.

A moderation analysis was conducted testing whether the influence of effort expectancy on a senior adult's behavioral intention toward using a social networking website is moderated by gender (Aguinis & Gottfredson, 2010; Baron & Kenny, 1986). The analysis conformed to best-practice recommendations for estimating interaction effects, that were outlined previously in the Data Analysis Strategies section of Chapter 3, to validate and determine the significance of evidence for a moderating relationship contingent upon gender within a multiple linear regression analysis. In this analysis, the predictor variable corresponded to effort expectancy and the moderating variable corresponded to gender. An interaction term was created between effort expectancy*gender. The criterion variable corresponded to behavioral intention.

Prior to the multiple linear regression analysis, the assumptions of normality, homoscedasticity, and absence of multicollinearity were tested to establish the validity of conclusions drawn from the statistical tests; each assumption was satisfied prior to proceeding with the moderation analysis. The normality assumption was tested through visual inspection of a normal P-P plot between the expected cumulative probability and the observed cumulative probability. The raw data closely followed the normality trend line, suggesting that the assumption of normality was met (see Figure 24).

Homoscedasticity was visually tested through inspection of a residuals scatterplot, and the assumption was met due to there not being a recurring pattern in the data (see Figure 25). The absence of multicollinearity assumption was tested by examination of variance

inflation factors (VIFs). VIF values below 10 suggested that the absence of multicollinearity assumption was met.

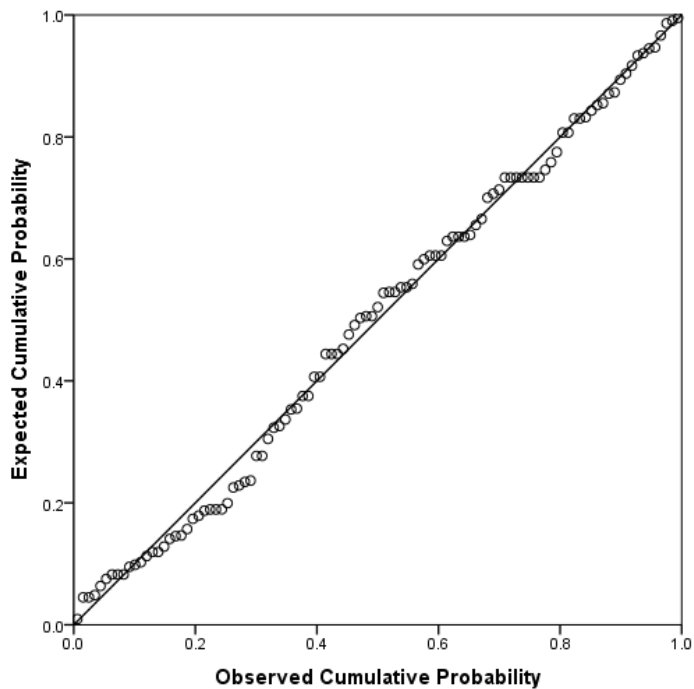


Figure 24. Normal P-P Plot for Effort expectancy, Gender, and Effort Expectancy*Gender Predicting Effort Expectancy.

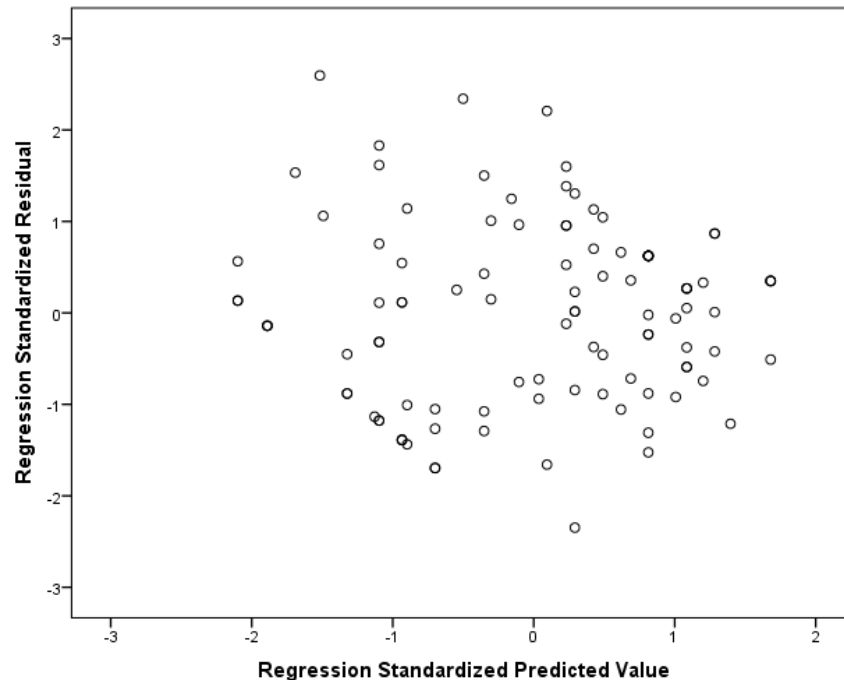


Figure 25. Standardized Predicted Values Versus Standardized Residuals for the Regression on Effort Expectancy.

Results of the overall model of the multiple linear regression were statistically significant, [$F(3, 101) = 59.24, p < .001, R^2 = .638$], suggesting a preliminary significant collective relationship between effort expectancy, gender, effort expectancy*gender, and behavioral intentions. The R^2 value suggests that approximately 63.8% of the variance in behavioral intentions can be explained by the predictors and interaction term.

The moderation analysis first showed that effort expectancy correlated with a senior adult's behavioral intentions to use SNSs and that it was also a significant predictor variable; however, further examination of the moderation analysis concluded that gender and the interaction term were not found to be significant in the model establishing that gender does not have a moderating effect in the relationship between effort expectancy and a senior adult's behavioral intention to use a social networking website. The absence of a significant moderation effect in the model asserts that no

further interpretation should be made in such a scenario since the interpretation would not be valid (Baron & Kenny, 1986; James & Brett, 1984; Judd & Kenny, 1981). The results of the multiple linear regression are presented in Table 14.

Table 14

*Results for Regression with Effort Expectancy, Gender, and Effort Expectancy*Gender Predicting Behavioral Intentions*

Source	<i>B</i>	<i>SE</i>	β	<i>t</i>	<i>p</i>	VIF
Effort expectancy	0.55	0.10	.62	5.59	<.001	2.28
Gender	-0.21	0.22	-.07	-0.93	.356	1.02
Effort expectancy*Gender	0.07	0.13	.06	.514	.609	2.26

Note. $F(3, 101) = 59.24, p < .001, R^2 = .638$.

Research Hypothesis 8 (H8): The influence of social influence on a senior adult's behavioral intention toward using a social networking website will be moderated by gender.

A moderation analysis was conducted testing whether the influence of social influence on a senior adult's behavioral intention toward using a social networking website is moderated by gender (Aguinis & Gottfredson, 2010; Baron & Kenny, 1986). The analysis conformed to best-practice recommendations for estimating interaction effects, that were outlined previously in the Data Analysis Strategies section of Chapter 3, to validate and determine the significance of evidence for a moderating relationship contingent upon gender within a multiple linear regression analysis. In this analysis, the predictor variable corresponded to social influence and the moderating variable corresponded to gender. An interaction term was created between social influence*gender. The criterion variable corresponded to behavioral intention.

Prior to the multiple linear regression analysis, the assumptions of normality, homoscedasticity, and absence of multicollinearity were tested to establish the validity of conclusions drawn from the statistical tests; each assumption was satisfied prior to proceeding with the moderation analysis. The normality assumption was tested through visual inspection of a normal P-P plot between the expected cumulative probability and the observed cumulative probability. The raw data closely followed the normality trend line, suggesting that the assumption of normality was met (see Figure 26).

Homoscedasticity was visually tested through inspection of a residuals scatterplot, and the assumption was met due to there not being a recurring pattern in the data (see Figure 27). The absence of multicollinearity assumption was tested by examination of variance inflation factors (VIFs). VIF values below 10 suggested that the absence of multicollinearity assumption was met.

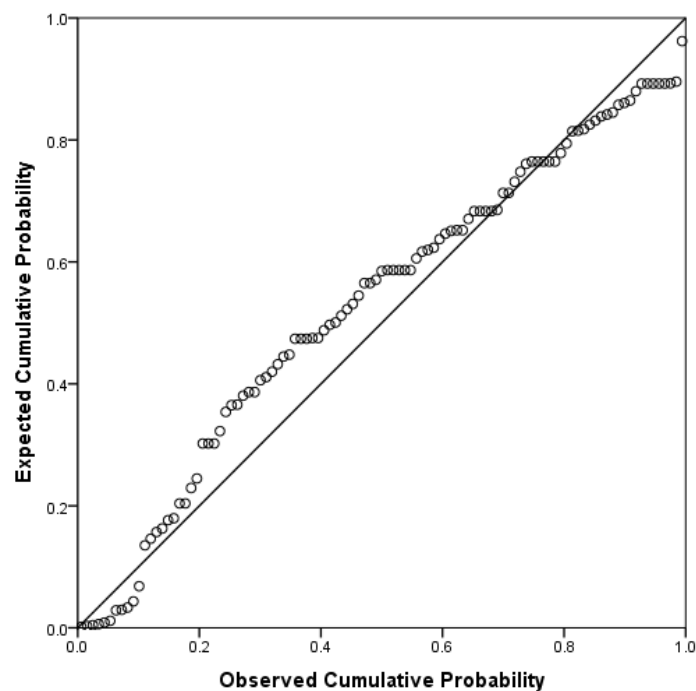


Figure 26. Normal P-P Plot for Social Influence, Gender, and Social Influence*Gender Predicting Behavioral Intention.

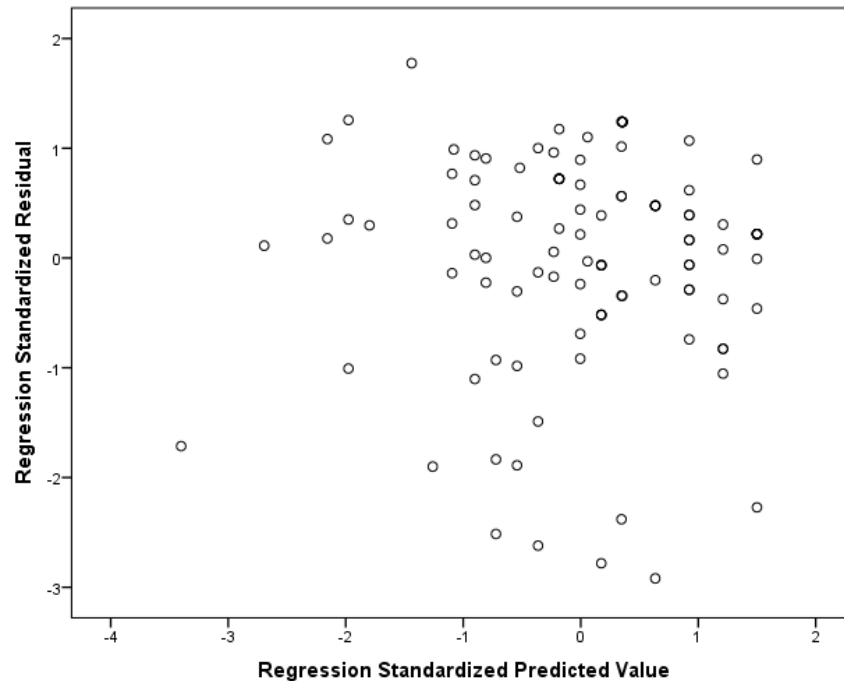


Figure 27. Standardized Predicted Values Versus Standardized Residuals for the Regression on Behavioral Intention.

Results of the overall model of the multiple linear regression were statistically significant, [$F(3, 101) = 3.09, p = .030, R^2 = .084$], suggesting a preliminary significant collective relationship between social influence, gender, social influence*gender, and behavioral intentions. The R^2 value suggests that approximately 8.4% of the variance in behavioral intentions can be explained by the predictors and interaction term.

The moderation analysis first showed that social influence correlated with a senior adult's behavioral intentions to use SNSs and that it was also a significant predictor variable; however, further examination of the moderation analysis concluded that gender and the interaction term were not found to be significant in the model establishing that gender does not have a moderating effect in the relationship between social influence and a senior adult's behavioral intention to use a social networking website. The absence of a

significant moderation effect in the model asserts that no further interpretation should be made in such a scenario since the interpretation would not be valid (Baron & Kenny, 1986; James & Brett, 1984; Judd & Kenny, 1981). The results of the multiple linear regression are presented in Table 15.

Table 15

*Results for Regression with Social Influence, Gender, and Social Influence*Gender Predicting Behavioral Intentions*

Source	<i>B</i>	<i>SE</i>	β	<i>t</i>	<i>p</i>	VIF
Social influence	0.38	0.19	.33	2.01	.047	2.90
Gender	-0.31	0.29	-.10	-1.06	.294	1.03
Social influence*Gender	-0.14	0.24	-.10	-0.61	.544	2.85

Note. $F(3, 101) = 3.09, p = .030, R^2 = .084$.

Summary

The purpose of this study was to investigate and identify factors that influence behavioral intention and use behavior of major online social networking websites among senior adults using the Unified Theory of Acceptance and Use of Technology (UTAUT) model. This chapter presented the findings of the data analysis. Descriptive statistics were used to explore the trends of the nominal and continuous level variables. Cronbach alpha's test of reliability was used to examine the internal consistency scales. Research hypotheses 1-5 were supported through use of simple linear regressions analyses. Finally, the use of multiple linear regressions revealed research hypotheses 6-8 were not supported, as gender did not have a significant moderating effect in the relationships as indicated in the findings of the data analysis.

Chapter 5

Conclusions, Implications, Recommendations, and Summary

Introduction

This chapter consolidates all findings from the dissertation study, beginning with reviewing the research hypotheses and conclusions drawn from the results of the data analysis. The implications of the findings from the study are reviewed and recommendations are proposed to the research community for future research opportunities as a result of this study's findings. Chapter 5 concludes with a comprehensive summary of the complete dissertation study.

Conclusions

The final sample of 105 participants from population groups in the Southern states of the United States of America yielded a fairly uniform representation of both male and female respondents, providing a solid basis for the study's conclusions as it relates to the moderating variable of gender.

Since most past studies in the body of work involving the UTUAT have disregarded all modifiers such as gender and age only to produce a study employing a subset of the UTUAT's constructs (Venkatesh, Thong, & Xu, 2003, 2012). This research study deliberately included one of the four moderators of the UTUAT to strengthen the reported findings—gender. Gender, being a unique aspect of this study, provided some important findings in hypothesizing that it can be used as a predictor for performance expectancy, effort expectancy, and social influence as they each relate to a senior adult's

behavioral intention to use social networking sites. Conclusions were drawn from the data indicating that in all three instances, gender was consistently not significant in the model and therefore was not a predictor for performance expectancy, effort expectancy, and social influence as previously thought at the onset of the study. Furthermore, it was concluded that a senior adult's perceived performance expectancy, effort expectancy, and social influence positively influence the senior's behavioral intention toward using a social networking website. Last, a senior adult's perception of facilitating conditions and their actual behavioral intention to use a social networking website positively influence the senior's use behavior for a social networking website.

Implications

This study has contributed to the existing body of knowledge for senior adults and social networking websites by providing human-computer interaction researchers and practitioners valuable insight into how senior adults perceive and use SNSs—implications include allowing researchers to use the findings to develop better ways of designing multidirectional interactive online communities to be more universally accessible in addition to helping them identify whether SNSs are actively meeting the needs of the senior adult population. This study further closes the gap in research specific to the behavioral intention and use behavior of SNSs among the senior adult population and can further be used to provide website designers and developers a better understanding of senior adults to improve their approach in accurately engaging the age group alongside the currently dominating younger adult age group. Other implications include the realization and significance of original work as there is still little relevant research available in providing equal access to social networking websites for older

adults as most of today's research is purely focused on only providing equal access to information itself (Jaeger & Xie, 2009; Lüders & Brandtzæg, 2014; Pfeil, 2007a; Pfeil, 2007b).

Recommendations

This research emphasized the behavioral intention and use behavior of social networking websites among the senior adult age group. For this study, the researcher prepared an online survey capable of being completed on both a mobile and desktop device and then surveyed willing participants regarding their usage of social networking sites. Future studies can expand on the research through:

1. Conducting the same study with senior adults that experience a variety of impairments such as cognitive, visual, auditory, or mobility.
2. Utilizing insight from this study for the development or refinement of more universally accessible guidelines for use in SNSs designed to better meet the needs of senior adults.
3. Conducting the same study but instead of looking at the moderating effect of gender, future studies can examine the other moderators of the UTAUT model such as: Age, Experience, and Voluntariness of Use.

Summary

This study evaluated and assessed several research hypotheses derived from the original UTAUT model by first simplifying the existing model to incorporate only the factors that pertain to this study and the data collected from participants.

The four key constructs of the simplified UTAUT research model were performance expectancy, effort expectancy, social influence, and facilitating conditions. The facilitating conditions construct was a determinant of use behavior while the other three constructs were direct determinants of behavioral intention. The impact of these same three constructs on behavioral intention was moderated by gender in the simplified UTAUT model applied in this study.

The following research hypotheses were all measured using data collected from the self-administered online survey e-mailed to several convenience samples of prospective senior adult participants:

- H1: *A senior adult's perceived performance expectancy positively influences the senior's behavioral intention toward using a social networking website.*
- H2: *A senior adult's perceived effort expectancy positively influences the senior's behavioral intention toward using a social networking website.*
- H3: *A senior adult's perceived social influence positively influences the senior's behavioral intention toward using a social networking website.*
- H4: *A senior adult's perception of facilitating conditions positively influences the senior's use behavior for a social networking website.*
- H5: *A senior adult's behavioral intention to use a social networking website positively influences the senior's use behavior for a social networking website.*

- H6: *The influence of performance expectancy on a senior adult's behavioral intention toward using a social networking website will be moderated by gender.*
- H7: *The influence of effort expectancy on a senior adult's behavioral intention toward using a social networking website will be moderated by gender.*
- H8: *The influence of social influence on a senior adult's behavioral intention toward using a social networking website will be moderated by gender.*

The results of the research analysis indicated that five of the eight hypotheses from the research model were supported through the use of simple linear regressions, while the last three research hypotheses were not supported in the moderation analyses, as gender did not have a moderating effect within in these three relationships. The indication of how the research hypotheses align with the UTAUT model resulted in the following determinations:

- H1: The linear regression analysis supported H1 in addition to the assumptions of linearity, normality, and homoscedasticity. The scatterplot used to test linearity showed positive association between perceived performance expectancy and behavioral intention. The normality trend line showed the raw data following closely suggesting the assumption was met. Inspection of a residuals scatterplot revealed no recurring pattern in the data in visually testing homoscedasticity. The overall model of the simple linear regression was statistically significant suggesting a significant relationship between performance expectancy and a senior's behavioral intention toward

using a social networking website. *Performance expectancy was a significant predictor in the model signifying that as performance expectancy scores increase, scores for a senior's behavioral intention toward using a social networking website also increased in proportion.*

- H2: The linear regression analysis supported H2 in addition to the assumptions of linearity, normality, and homoscedasticity. The scatterplot used to test linearity showed positive association between perceived effort expectancy and behavioral intention. The normality trend line showed the raw data following closely suggesting the assumption was met. Inspection of a residuals scatterplot revealed no recurring pattern in the data in visually testing homoscedasticity. The overall model of the simple linear regression was statistically significant suggesting a significant relationship between effort expectancy and a senior's behavioral intention toward using a social networking website. *Effort expectancy was a significant predictor in the model signifying that as effort expectancy scores increase, scores for a senior's behavioral intention toward using a social networking website also increased in proportion.*

- H3: The linear regression analysis supported H3 in addition to the assumptions of linearity, normality, and homoscedasticity. The scatterplot used to test linearity showed positive association between perceived social influence and behavioral intention. The normality trend line showed the raw data following closely suggesting the assumption was met. Inspection of a residuals scatterplot revealed no recurring pattern in the data in visually

testing homoscedasticity. The overall model of the simple linear regression was statistically significant suggesting a significant relationship between social influence and a senior's behavioral intention toward using a social networking website. *Social influence was a significant predictor in the model signifying that as social influence scores increase, scores for a senior's behavioral intention toward using a social networking website also increased in proportion.*

- H4: The simple linear regression analysis supported H4 in addition to the assumptions of linearity, normality, and homoscedasticity. The scatterplot used to test linearity showed positive association between perceived facilitating conditions and use behavior. The normality trend line showed the raw data following closely suggesting the assumption was met. Inspection of a residuals scatterplot revealed no recurring pattern in the data in visually testing homoscedasticity. The overall model of the simple linear regression was statistically significant suggesting a significant relationship between facilitating conditions and a senior's use behavior for a social networking website. *Facilitating conditions was a significant predictor in the model signifying that as facilitating conditions scores increase, scores for a senior's use behavior for a social networking website also increased in proportion.*
- H5: The simple linear regression analysis supported H5 in addition to the assumptions of linearity, normality, and homoscedasticity. The scatterplot used to test linearity showed positive association between behavioral intention to use a social networking website and use behavior. The normality trend line

showed the raw data following closely suggesting the assumption was met. Inspection of a residuals scatterplot revealed no recurring pattern in the data in visually testing homoscedasticity. The overall model of the simple linear regression was statistically significant suggesting a significant relationship between behavioral intention to use a social networking website and a senior's use behavior for a social networking website. *Behavioral intention was a significant predictor in the model signifying that as behavioral intention scores increase, scores for a senior's use behavior for a social networking website also increased in proportion.*

- H6: The moderation analysis did not support H6. The assumptions of normality, homoscedasticity, and absence of multicollinearity were tested to establish the validity of conclusions drawn from the statistical tests. The normality trend line showed the raw data following closely suggesting the assumption was met. Inspection of a residuals scatterplot revealed no recurring pattern in the data in visually testing homoscedasticity. Examination of VIFs indicated the absence of multicollinearity assumption was met. The overall model of the multiple linear regression was statistically significant suggesting a preliminary significant collective relationship between performance expectancy, gender, performance expectancy*gender, and behavioral intention to use a social networking website. *Further examination of the moderation analysis concluded that performance expectancy was a significant predictor variable; however, gender and the interaction term were not found to be significant in the model indicating that gender does not have a*

moderating effect in the relationship between performance expectancy and a senior adult's behavioral intention to use a social networking website.

- H7: The moderation analysis did not support H7. The assumptions of normality, homoscedasticity, and absence of multicollinearity were tested to establish the validity of conclusions drawn from the statistical tests. The normality trend line showed the raw data following closely suggesting the assumption was met. Inspection of a residuals scatterplot revealed no recurring pattern in the data in visually testing homoscedasticity. Examination of VIFs indicated the absence of multicollinearity assumption was met. The overall model of the multiple linear regression was statistically significant suggesting a preliminary significant collective relationship between effort expectancy, gender, effort expectancy*gender, and behavioral intention to use a social networking website. *Further examination of the moderation analysis concluded that effort expectancy was a significant predictor variable; however, gender and the interaction term were not found to be significant in the model indicating that gender does not have a moderating effect in the relationship between effort expectancy and a senior adult's behavioral intention to use a social networking website.*

- H8: The moderation analysis did not support H8. The assumptions of normality, homoscedasticity, and absence of multicollinearity were tested to establish the validity of conclusions drawn from the statistical tests. The normality trend line showed the raw data following closely suggesting the assumption was met. Inspection of a residuals scatterplot revealed no

recurring pattern in the data in visually testing homoscedasticity. Examination of VIFs indicated the absence of multicollinearity assumption was met. The overall model of the multiple linear regression was statistically significant suggesting a preliminary significant collective relationship between social influence, gender, social influence*gender, and behavioral intention to use a social networking website. *Further examination of the moderation analysis concluded that social influence was a significant predictor variable; however, gender and the interaction term were not found to be significant in the model indicating that gender does not have a moderating effect in the relationship between social influence and a senior adult's behavioral intention to use a social networking website.*

Chapter 5 continued to explore the findings of the statistical analyses while also investigating further connections made within the literature and the UTAUT's theoretical framework. Following the purposeful inclusion of the gender moderator from the UTAUT model, this distinctive aspect provided important findings concluding that gender was definitively not a predictor for performance expectancy, effort expectancy, and social influence as they each relate to a senior adult's behavioral intention to use social networking sites. The present gap in research specific to the behavioral intention and use behavior of social networking sites among the senior adult population is further closed as a result of this research. The chapter explored and indicated several future directions for additional research concluding with a comprehensive summary of the complete dissertation study delineated in detail for the reader.

Appendix A



Alabama South District Church of the Nazarene

Dr. Mark D. Berry, District Superintendent
P. O. Box 680898, Prattville, AL 36068 • 334.365.3188 • FAX: 334.380.4525

October 8, 2015

Institutional Review Board
Nova Southeastern University
3301 College Avenue
Fort Lauderdale, FL 33314-7796

NSU IRB Office:

I hereby give Mr. Andrew Berry permission to conduct his dissertation research from Nova Southeastern University titled *Behavior Intention and Use Behavior of Social Networking Websites Among Senior Adults* through the use of an electronic survey sent out to my district members in the Southern Alabama region.

I understand that Mr. Berry will be collecting and presenting his research in a confidential manner and have had several discussions with him in length involving the duration of the study and it is my understanding that any research will not have any known risk to human subjects.

Please contact me for any questions that Nova Southeastern University or any of its affiliates may have in relation to Mr. Berry's study.

Sincerely,

Dr. Mark D. Berry,
Alabama South District Superintendent

Appendix B

**South Coastal District***Dr. Daniel A. Berry, District Superintendent*

October 27, 2015

Institutional Review Board
Nova Southeastern University
3301 College Avenue
Fort Lauderdale, FL 33314-7796

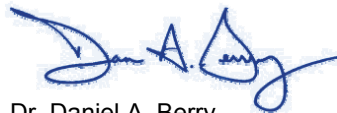
University IRB Office:

As District Superintendent of the South Coastal District of The Wesleyan Church, I have given Mr. Andrew M. Berry permission to conduct his research through an electronic survey for in relation to *Behavior Intention and Use Behavior of Social Networking Websites Among Senior Adults* for his dissertation research at Nova Southeastern University.

I have spoken with Mr. Berry and understand the scope of his research and how he will collect and present his data. All information to be gathered will be done in a confidential appropriate manner. I further understand that Mr. Berry's study is expected to run for no more than eight weeks. At no time will Mr. Berry's research be used in a way that would have potential risk to human participants.

Should Nova Southeastern University, the dissertation chair, committee members, or the Internal Review Board have any questions, please feel free to contact me directly.

Sincerely,



Dr. Daniel A. Berry
District Superintendent

1261 Parker Rd. SE, Conyers GA 30094**www.southcoastal.org - 770-922-7514 - office@southcoastal.org**

Appendix C



May 12, 2017

Andrew Berry
School of Business and Technology
3313 Tinney Place
Nashville, TN 37217

Faculty Advisor: Dr. Maxine Cohen, Nova Southeastern University

Dear Andrew,

On behalf of Trevecca Nazarene University, I approve your request to conduct your research project entitled "Behavioral Intention and Use Behavior of Social Networking Websites Among Senior Adults". It is understood that you will send subjects, senior adults directly associated with TNU, an email which will include a hyperlink pointing to the self-administered online survey. The electronic survey will be conducted with anonymity and contacted subjects may choose not to participate or may opt out at any time.

Sincerely,

Tom Middendorf, Ed.D.

Associate Vice President for Academic Services
Trevecca Nazarene University
333 Murfreesboro Rd.
Nashville, TN 37210
615-248-1258

Appendix D

MEMORANDUM

To: **Andrew M Berry, M.S.**
College of Engineering and Computing

From: **Ling Wang, Ph.D.,**
Center Representative, Institutional Review Board

Date: **February 13, 2017**

Re: **IRB #: 2017-100; Title, "Behavioral Intention and Use Behavior of Social Networking Websites Among Senior Adults"**

I have reviewed the above-referenced research protocol at the center level. Based on the information provided, I have determined that this study is exempt from further IRB review under **45 CFR 46.101(b) (Exempt Category 2)**. You may proceed with your study as described to the IRB. As principal investigator, you must adhere to the following requirements:

- 1) **CONSENT:** If recruitment procedures include consent forms, they must be obtained in such a manner that they are clearly understood by the subjects and the process affords subjects the opportunity to ask questions, obtain detailed answers from those directly involved in the research, and have sufficient time to consider their participation after they have been provided this information. The subjects must be given a copy of the signed consent document, and a copy must be placed in a secure file separate from de-identified participant information. Record of informed consent must be retained for a minimum of three years from the conclusion of the study.
- 2) **ADVERSE EVENTS/UNANTICIPATED PROBLEMS:** The principal investigator is required to notify the IRB chair and me (954-262-5369 and Ling Wang, Ph.D., respectively) of any adverse reactions or unanticipated events that may develop as a result of this study. Reactions or events may include, but are not limited to, injury, depression as a result of participation in the study, life-threatening situation, death, or loss of confidentiality/anonymity of subject. Approval may be withdrawn if the problem is serious.
- 3) **AMENDMENTS:** Any changes in the study (e.g., procedures, number or types of subjects, consent forms, investigators, etc.) must be approved by the IRB prior to implementation. Please be advised that changes in a study may require further review depending on the nature of the change. Please contact me with any questions regarding amendments or changes to your study.

The NSU IRB is in compliance with the requirements for the protection of human subjects prescribed in Part 46 of Title 45 of the Code of Federal Regulations (45 CFR 46) revised June 18, 1991.

Cc: Maxine Cohen, Ph.D.
 Ling Wang, Ph.D.

Appendix E

Scale Used for Survey Instrument Questions

All questions in the survey will use a seven-point Likert scale for measurement of responses related to each of the exogenous variables, endogenous variables, with the exception of the gender moderator which will be an option for Male or Female and will only be collected for demographic data.

The following measurement will be used for:

- The exogenous variables of *Performance Expectancy*, *Effort Expectancy*, *Social Influence*, and *Facilitating Conditions*
- The endogenous variables of *Behavioral Intention* and *Use Behavior*

Answer:	Strongly Disagree	Disagree	Slightly Disagree	Neutral	Slightly Agree	Agree	Strongly Agree
Value:	1	2	3	4	5	6	7

Appendix F

Demographic and UTAUT Research Model Construct Survey

Demographic Information

1. What is your age?
(Drop down menu for Prefer not to disclose, 18-120 (in increments))
2. What is your gender?
(Male/Female/Prefer not to disclose)
3. Please select the option that best describes your job situation:
(Check-boxes for work full-time (40 or more hours per week), work part-time, retired, volunteer, currently seeking employment)
4. If you are still working, do you use SNSs for your job?
(Yes or No)
5. If you use SNSs, which ones do you use? (check all that apply)
(Checkboxes for Facebook, Twitter, Instagram, Snapchat, Pinterest, Google+, LinkedIn, Other (fill-in))

Performance Expectancy

6. I find SNSs useful.

Strongly Disagree	Disagree	Slightly Disagree	Neutral	Slightly Agree	Agree	Strongly Agree
1	2	3	4	5	6	7

7. Using SNSs enables me to accomplish tasks more quickly.

Strongly Disagree	Disagree	Slightly Disagree	Neutral	Slightly Agree	Agree	Strongly Agree
1	2	3	4	5	6	7

8. Using SNSs increases my productivity.

Strongly Disagree	Disagree	Slightly Disagree	Neutral	Slightly Agree	Agree	Strongly Agree
1	2	3	4	5	6	7

Effort Expectancy

9. My interaction with SNSs would be clear and understandable.

Strongly Disagree	Disagree	Slightly Disagree	Neutral	Slightly Agree	Agree	Strongly Agree
1	2	3	4	5	6	7

10. It would be easy for me to become skillful at using SNSs.

Strongly Disagree	Disagree	Slightly Disagree	Neutral	Slightly Agree	Agree	Strongly Agree
1	2	3	4	5	6	7

11. I would find SNSs easy to use.

Strongly Disagree	Disagree	Slightly Disagree	Neutral	Slightly Agree	Agree	Strongly Agree
1	2	3	4	5	6	7

12. Learning to operate SNSs is easy for me.

Strongly Disagree	Disagree	Slightly Disagree	Neutral	Slightly Agree	Agree	Strongly Agree
1	2	3	4	5	6	7

Social Influence

13. People who influence my behavior think that I should use SNSs.

Strongly Disagree	Disagree	Slightly Disagree	Neutral	Slightly Agree	Agree	Strongly Agree
1	2	3	4	5	6	7

14. People who are important to me think that I should use SNSs.

Strongly Disagree	Disagree	Slightly Disagree	Neutral	Slightly Agree	Agree	Strongly Agree
1	2	3	4	5	6	7

15. My friends and family have been helpful in the use of SNSs.

Strongly Disagree	Disagree	Slightly Disagree	Neutral	Slightly Agree	Agree	Strongly Agree
1	2	3	4	5	6	7

Facilitating Conditions

16. I have the resources necessary to use SNSs.

Strongly Disagree	Disagree	Slightly Disagree	Neutral	Slightly Agree	Agree	Strongly Agree
1	2	3	4	5	6	7

17. I have the knowledge necessary to use SNSs.

Strongly Disagree	Disagree	Slightly Disagree	Neutral	Slightly Agree	Agree	Strongly Agree
1	2	3	4	5	6	7

18. SNSs are not compatible with other websites that I use.

Strongly Disagree	Disagree	Slightly Disagree	Neutral	Slightly Agree	Agree	Strongly Agree
1	2	3	4	5	6	7

19. A specific person (or group) is available for assistance with SNSs difficulties.

Strongly Disagree	Disagree	Slightly Disagree	Neutral	Slightly Agree	Agree	Strongly Agree
1	2	3	4	5	6	7

Behavioral Intentions to Use SNSs

20. I intend to continue using SNSs in the future.

Strongly Disagree	Disagree	Slightly Disagree	Neutral	Slightly Agree	Agree	Strongly Agree
1	2	3	4	5	6	7

21. I will always try to use SNSs in my daily life.

Strongly Disagree	Disagree	Slightly Disagree	Neutral	Slightly Agree	Agree	Strongly Agree
1	2	3	4	5	6	7

22. I plan to continue to use SNSs frequently.

Strongly Disagree	Disagree	Slightly Disagree	Neutral	Slightly Agree	Agree	Strongly Agree
1	2	3	4	5	6	7

Actual Usage Behavior of SNSs

23. I currently use SNSs (n).

(Drop down menu for n= 0: I do not use SNSs at all; n= 1: less than once a week; n= 2: about once each week; n= 3: several times each week; n= 4: about once each day; n= 5: several times a day.)

Appendix G

Introductory E-mail Requesting Participation in Survey

[Today's Date]

Dear Prospective Participant from [SITE NAME]:

Good afternoon. You are receiving this e-mail as part of an optional survey being conducted towards the completion of my dissertation study. I am currently a doctoral student at Nova Southeastern University in the College of Engineering and Computing located in Fort Lauderdale, FL. Your participation is voluntary and you may withdraw completion of this survey at anytime, however your response to this anonymous survey is crucial in providing the necessary information to further investigate and identify factors that influence behavioral intention and use behavior of online social networking websites. All submissions are anonymous, protected securely, and none of the data collected will in any way link directly to you if you decide to participate in this survey.

The purpose of this survey is to collect anonymous information from senior adults age 65 or older that can be used to help better develop and design social networking sites (SNSs) to more actively engage the senior adult population. Social networking sites are web-based services that allows individuals to construct a public or semi-public profile within a bounded system, articulate a list of other users with whom they share a connection, and view and traverse their list of connections and those made by others within the system. Examples include Facebook, LinkedIn, Twitter, Google+, MySpace, Instagram, Snapchat, Google's Picasa, and Yahoo!'s Flickr.

Your participation in this brief survey will provide valuable insight through the reported findings which can be used as a determinant for discovery of how social networking sites can be designed to be more universally accessible and cater to the unique needs of the senior adult population. Below, you will find a website address/link that can be clicked on which will take you to the online survey to be completed at your own pace within an estimated 5 minutes. If you have any questions prior to completing the survey, please feel free to respond to this e-mail for further clarification or assistance in accessing the survey. Your response and time is greatly appreciated, thank you!

Sincerely,

Andrew Berry
Doctoral Student, Nova Southeastern University

Appendix H

Online Survey Instructions and Participation Letter

Online Survey Instructions

Please click the survey link sent to you in the recruitment email you received. You will be taken to an online survey hosted by Survey Monkey and will be provided with a series of questions which you should answer as accurately and honestly as possible, choosing the most suitable response to you as no answer is either right or wrong. No data will be linked to either you or your email address, submissions are completely anonymous. Optionally, you may click the link below to begin the survey. Once complete, be sure to submit your response by clicking “Done” upon completion to send a record of your responses to the researcher:

Online Survey Link: [LINK INSERTED HERE]

Thank you again for your time!

Online Participation Letter

Research Topic

Behavioral Intention and Use Behavior of Social Networking Websites among Senior Adults

The Researcher & IRB Contact Information

You may contact Andrew Berry directly at berrandr@nova.edu for questions, comments, or concerns regarding this survey and the use of any collected data. The Institutional Review Board at Nova Southeastern University, Office of Grants and Contracts may be reached by phone at 954-262-5369, toll-free at 866-499-0790, or IRB@nsu.nova.edu.

Purpose

The main goal for this dissertation research is to investigate and identify factors that influence behavioral intention and use behavior of major online social networking websites among senior adults using the Unified Theory of Acceptance and Use of Technology (UTAUT) model.

Participation Requirements

Voluntary participation provides no direct or monetary benefits to you and will take approximately 5 minutes of your time to complete. Senior adults 65 years of age or older are eligible to complete this survey—all other data from respondents under the age of 65

will be excluded from the survey results. By completing and submitting this survey, you agree to allow your anonymous responses to be collected, analyzed, and shared with the research community as part of the requirements for the researcher's dissertation report.

Potential Risk or Discomfort

There are no anticipated risks, other than a possible slight sense of discomfort, as you complete the survey questions.

Potential Benefit or Cost/Payments to the Participant

Voluntary participation provides no direct or monetary benefits to you, however implications of the study may lead to a better understanding and discovery of the unique needs and requirements for seniors in relation to social networking websites.

Confidentiality

Information collected by the researcher will be stored securely and confidentially in a password protected database. All responses are anonymous and are not associated with you or your email in anyway.

Refusal/Withdraw

You may elect to stop or refuse participation in this study/survey at any time without penalty. Questions regarding your rights as a participant of this study may be sent to IRB@nova.edu

I have read this letter and I fully understand the contents of this document and voluntarily consent to participate. All of my questions concerning this research have been answered. If I have any questions in the future about this study they will be answered by the investigator listed above.

I understand that the completion of this questionnaire implies my consent to participate in this study.

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