

Use Authorization

In presenting this dissertation in partial fulfillment of the requirements for an advanced degree at Idaho State University, I agree that the Library shall make it freely available for inspection. I further state that permission to download and/or print my dissertation for scholarly purposes may be granted by the Dean of the Graduate School, Dean of my academic division, or by the University Librarian. It is understood that any copying or publication of this dissertation for financial gain shall not be allowed without my written permission.

Signature _____

Date _____

UNDERSTANDING SOCIAL NETWORK SITE USE FOR SOCIAL
CONNECTEDNESS AMONG RURAL OLDER ADULTS

by

Allison Findlay

A dissertation

submitted in partial fulfillment

of the requirements for the degree of

Doctor of Philosophy in the School of Nursing

Idaho State University

May 2017

Copyright (2017) Allison Findlay

Committee Approval

To the Graduate Faculty,

The members of the committee appointed to examine the dissertation of ALLISON FINDLAY find it satisfactory and recommend that it be accepted.

Mary A. Nies, PhD, RN, FAAN, FAAHB
Committee Chair

Julius Kehinde, PhD, RN
Committee Member

Peter Denner, PhD
Committee Member

H. Cathleen Tarp, PhD
Graduate Faculty Representative

Research Approval – Human Subjects

June 3, 2016
Allison Findlay
School of Nursing

RE: regarding study number IRB-FY2016-366: UNDERSTANDING SOCIAL NETWORKING SITE USE FOR SOCIAL CONNECTEDNESS AMONG RURAL OLDER ADULTS

Dear Ms. Findlay:

Thank you for your responses from a review of the study listed above. These responses qualify for expedited review under OHRP guidelines. This is to confirm that I have approved your application.

Notify the HSC of any adverse events. Serious, unexpected adverse events must be reported in writing within 10 business days.

You may conduct your study as described in your application effective immediately. The study is subject to renewal on or before Jun 3, 2017, unless closed before that date.

Please note that any changes to the study as approved must be promptly reported and approved. Some changes may be approved by expedited review; others require full board review. Contact Tom Bailey (208)-282-2179; email humsubj@isu.edu if you have any questions or require further information.

Sincerely,

Ralph Baergen, PhD, MPH, CIP
Human Subjects Chair

Acknowledgments

I would like to express my gratitude to the members of my dissertation committee, Dr. Mary A. Nies, Dr. Julius Kehinde, and Dr. Peter Denner for sharing their time and research expertise. Without their guidance and support throughout the process, this dissertation would not have been possible. Dr. Mary A. Nies, my Chair and advisor throughout the doctoral program, provided constant encouragement and support. Her wisdom, mentorship, and guidance during the dissertation process, especially during data collection in the community, was extremely helpful. Dr. Julius Kehinde, my committee member, provided the foundation for scholarly writing and theoretical underpinnings that were required in this endeavor. His knowledgeable input made the process easier. Dr. Peter Denner, my committee member, provided tireless statistical support and editing of the dissertation. Dr. Karen Neill, faculty member at Idaho State University, edited the early work on this dissertation. Her guidance was a valuable contribution to this dissertation. Dr. Helen Tarp, graduate faculty representative, provided valuable editing of the final dissertation. A big thank you to my cohorts in the PhD program, Lillian Jones, Michelle Critchfield, and Linda Larson Spagon, for peer reviews and support for this research.

My children, Colin, Nick and Ircia, have been a constant source of love and support. I hope this degree inspires them to pursue their own dreams. Thank you to my friends, Rina and Brandon Grover, and Sherill Kowall, who encouraged and uplifted me every step of the way.

Table of Contents

List of Figures	x
List of Tables	xi
List of Abbreviations	xii
Glossary	xiii
Abstract	xiv
Chapter I: Introduction	1
Background	2
Summary	11
Research Problem.....	12
Purpose of the Study	12
Research Questions	13
Assumptions	14
Limitations	15
Significance of the Study	15
Chapter II: Literature Review	18
Method	18
Review of Relevant Literature	18
Social Presence on Social Networking Sites.....	19
Self-efficacy with Technology	21
Motivations for Social Presence on Social Networking Sites.....	22
Social Presence and Communication on Network Sites	23
Age and Social Network Size.....	25

Non-users of Social Networking Sites	25
Social Awareness and Role Satisfaction and Loneliness	27
Traditional versus SNS Communication.....	27
Social Connectedness	29
Summary	29
Theoretical Framework	31
Chapter III: Methodology	37
Research Design	37
Setting.....	37
Participants	38
Sampling.....	38
Recruitment Strategies	38
Procedures	40
Data Collection.....	41
Instrumentation.....	41
Data Analysis	44
Chapter IV: Results.....	47
Purpose of the Study	47
Data Collection and Sample.....	48
Missing Data	48
Descriptive Statistics.....	49
Demographic Characteristics	49
Relationship between demographic characteristics and SNS use.....	52

Computer-Mediated Differences between SNS Users and Non-Users.....	53
Predictors of Social Networking Site Use	56
Reasons Not to Use Social Networking Sites	61
Characteristics of Social Network Site Usage	62
Social Awareness and Social Presence Predictors of Social Connectedness	64
Age and Online Social Network Size	65
Social Connectedness Predictors of SNS Use	66
Perceptions of SNS Use and Social Connectedness	70
Validity and Reliability.....	74
Summary of Results.....	75
Chapter V: Discussion	77
Sample and Generalizability	77
Discussion of Findings Related to Theoretical Framework.....	78
Conclusion	87
Limitations	87
Implications.....	88
Recommendations for Future Research	90
References.....	91
Appendix A: Instrumentation	105
Appendix A - 1: Demographic Questionnaire	106
Appendix A – 2 Social Connectedness Scale – Revised	108
Appendix A - 3: Social Networking Site Survey.....	110

List of Figures

Figure 1. Riedl et al.'s (2013) Theoretical Model of Social Connectedness	32
Figure 2. Age difference between SNS Users/ Non-users	53
Figure 3. Marital status difference between SNS Users and Non-users.....	53
Figure 4. Education difference between SNS Users and Non-users.....	54
Figure 5. Income difference between SNS Users and Non-users	54
Figure 6. Home computer access, difference between SNS Users and Non-users	58
Figure 7. Internet at home, difference between SNS Users and non-Users.....	59
Figure 8. Comfortable with Internet, difference between SNS Users and Non-users	59
Figure 9. Importance of SNSs, difference between SNS Users and Non-users	60
Figure 10. Privacy policy effective of SNSs, difference between SNS Users and Non-users	60
Figure 11. Reasons why Non-users do not use Social Networking Sites	62
Figure 12. SNS use and effect on social life among SNS Users.....	69

List of Tables

Table 1. Demographic characteristics of SNS Users versus Non-Users	51
Table 2. Pearson’s Chi-Square Test between demographics and SNS Users and Non-users	52
Table 3. Pearson’s Chi-Square Test of Association between computer-mediated characteristics and SNS Users versus Non-users.....	53
Table 4. Logistic regression predicting SNS Use based on demographic and computer-mediated predictor variables.....	57
Table 5. Summary of linear regression data predicting social connectedness based on social awareness and social presence variables	65
Table 6. Hierarchal logistic regression predicting SNS use based on social connectedness	68

List of Abbreviations

SNSsSocial Networking Sites

ICT.....Information and Communication Technology

Glossary

Health	A state of complete physical, social and mental wellbeing, not only the absence of disease or infirmity (WHO, 1997, p. 1).
Social Isolation	The limited ability or access to social relationships and networks that provide meaningful interactions and involvement with social activities (Nicholson, 2009).
Health Inequities or Inequalities	Avoidable differences in health status between groups of people arising from inequalities in social and economic conditions within and between societies (WHO, 2008).
Rural	Areas of low population density, physical remoteness, and small aggregate size, defined by the Census Bureau as areas less than 55,000 people, or clusters of less than 2,500 people (IOM, 2004)
Social Media	Computer and internet-based communication tools and platforms that “consume, co-create, share, and modify user-generated content” (Leist, 2013, p. 379).
Social Network Sites (SNSs)	“Web-based services that allow individuals to (1) construct a public or semi-public profile within a bounded system, (2) articulate a list of other users with whom they share a connection, and (3) view and traverse their list of connections and those made by others within the system” (Boyd & Ellison, 2007, p. 211).
Social Connectedness	“The degree to which a person or group is socially close, interrelated, or shares resources with other persons or groups” (CDC, 2008, p. 3). Social connectedness is determined by the quantity and quality of an individual’s social relationships with others and the community (CDC, 2008).

**Understanding Social Networking Use for
Social Connectedness among Rural Older Adults**

Dissertation Abstract--Idaho State University (2017)

The purpose of this study was to examine: a) characteristics of rural older adult social network site users and non-users, b) relationships between rural older adult age and online network size, and c) relationship between them in regards to social connectedness, and d) to describe their perceptions of social network site use. The theoretical framework was based on the Theoretical Model of Social Connectedness adapted by Riedl, Köbler, Goswami, and Krcmar (2013).

A convenience sample of 350 rural older adults age 65 years and older in Southeast Idaho rural counties participated in this mixed method quantitative and qualitative cross sectional descriptive study. Quantitative data was collected using a structured questionnaire including a demographic survey, the Social Networking Site (SNS) survey, and the Social Connectedness Scale (SCS-R), followed by a qualitative focus group discussion with six participants randomly selected from the sample.

Quantitative data was analyzed by descriptive and inferential statistics and correlational and hierarchal regression. Qualitative discussion data was recorded and transcribed as verbatim and categorized into themes that were analyzed to provide further understanding of quantitative data.

Controlling for demographics, social connectedness was not an indicator of SNS use. Rural older adults who had home Internet, felt comfortable using the Internet, and viewed SNSs as important were more likely to use SNSs. Younger-old adults, married,

with college education and/or higher income, were more likely to be SNS Users. SNS Users and Non-users preferred other forms of communication to maintain social connectedness. Overcoming negative perceptions of SNSs and having access and ability to use SNSs may increase likelihood of use, and offer an interventional strategy for social connectedness. Further research is needed to understand the relationship between SNSs and social determinants of health.

CHAPTER 1

Introduction

Developing successful interventions to improve healthy aging and quality of life for older adults is an important goal of national health agencies, in order to improve the health and social conditions of a growing population of older adults (Institute of Medicine [IOM], 2004; World Health Organization [WHO], 2008). Healthy aging is about more than the absence of disease or disability, it “includes aspects of physical, functional, mental, and social wellbeing and is an interactive, socially embedded process” (Sadana, Blas, Budwanhi, Koller, & Paraje, 2016, p. S180). Social factors determine a significant degree of health and risk of illness, and are primarily responsible for producing health differences among social groups (WHO, 2008). The WHO *World Report on Ageing and Health* (2015) emphasizes the need to act to develop and maintain the functional capacities of older adults in combination with the physical, social, and policy environments in which they live, to enable wellbeing in older age.

Adults age 65 years and older currently comprise 13% of the U.S. population, over 35 million people, and their numbers are expected to double by the year 2030 to 72 million as baby boomers approach old age (Federal Interagency Forum, 2012). As older adults are living longer, the population over 85 years of age will also increase, and could grow to 19 million by 2050 (Federal Interagency Forum, 2012). It is not enough to focus on healthy behaviors to improve health, these considerations highlight the need to address the social factors that improve the health outcomes and wellbeing of older adult populations (Marmot, 2013; WHO, 2008).

Rural older adult social and environmental conditions of weather, distance, and isolation make them particularly vulnerable to poor health outcomes (Winters, 2014). Limited resources and opportunities for social interaction can lead to social isolation, a serious adverse health outcome that poses a barrier to healthy aging (Bradley, 2011; Hawton et al., 2011; Nicholson, 2009). Literature has demonstrated that Internet and social network technology use is associated with higher levels of social connectivity and social support, decreased feelings of loneliness and depression, and generally more positive attitudes toward aging (Nimrod, 2013). These findings suggest that social networking technologies have the potential to overcome barriers of rural living, and increase social connectedness, yet little is known about social networking use in this population (Hutto et al, 2015; Nimrod, 2013).

Background

According to the 2010 U. S. Census, the Western United States has the fastest growing older adult population (Werner, 2011). Approximately 8.5 million (17%) are classified as rural older adults, and 1.2 million (2.2%) are persons aged 85 years and older (Werner, 2011). On average, they are more likely to be older, poorer, uninsured, and suffer from higher chronic health conditions than urban counterparts (Federal Interagency Forum, 2012). These disparities can cause significant differences in their health outcomes and quality of life (WHO, 2008), yet little is known about the relationship of social determinants and overall health outcomes that can aid in addressing health inequities in American rural older adults (National Institute on Aging [NIA], 2011).

A growing body of evidence suggests a positive correlation between social interaction and health and well-being among older adults and significant adverse effects

of social isolation on mortality and morbidity (NIA, 2011). Social technology may provide an important intervention for increasing connectedness in older adults.

Examination of the unique characteristics of social relationships within the context of social networking technology and the rural environment will aid in tailoring interventions to the specific needs and contexts in which these older adults live and age, to promote healthy aging (NIA, 2011).

Social Networks

Social networks provide opportunities for interaction with other members, leading to perceptions of being socially connected (Ashida & Heaney, 2008). Rural older adults live within social networks that are characterized by structural and functional characteristics of social ties that influence social connectedness (Ashida & Heaney, 2008). Social network density and having network members living close by have been positively associated with perceived social connectedness and engagement, and had a significant positive association with health status for older adults (Ashida & Heaney, 2008; Golden, Conroy, & Lawlor, 2009).

The quality and type of social network plays an important role in older adult mental health. Older adults with a higher quality of social networks that included friends as well as family reported less depressive symptoms (Fiori, Antonucci, & Cortina, 2006) and higher social engagement than those with social networks without friends (Golden et al, 2009). These studies suggest social relationships outside of family networks provide greater health benefits than family-dependent types of social networks.

Social engagement and large social networks have also been shown to foster familiarity and trust, a sense of belonging and value, and a collective responsibility to help one another, key strengths of aging in rural communities (Bacsu et al., 2012).

For rural older adults, membership in social networks can provide vital opportunities for social engagement, and are important determinants of how they perceive their physical, social, and environmental health; the more socially connected, the higher the perceptions of social, physical, and mental health and quality of life among rural older adults (Bacsu et al., 2012; Dongre & Deshmukh, 2012; Galloway & Henry, 2014).

Social Connectedness

Social connectedness has been defined by the CDC (2008) as “the degree to which a person or group is socially close, interrelated, or shares resources with other persons or groups” (p. 3), and is determined by the social network structures, and the quantity and quality of social relationships with others and the community (The Centers for Disease Control and Prevention [CDC], 2008). There is a large body of literature demonstrating the beneficial health effects of social connectedness, social networking, social support and participation (CDC, 2008; NIA, 2011).

Studies demonstrate that higher levels of social engagement are associated with higher levels of older adult health and wellbeing, evidenced by a reduced prevalence of depression and generalized anxiety disorder, physical and cognitive impairments, and higher levels of quality of life (Golden et al., 2009). Galloway and Henry (2014) found rural older adults with higher degrees of social connectedness were more likely to be less depressed. The ability to stay socially connected, however, can be a challenge for rural and aging adults, who may be experiencing physical and mental decline, changes in

social roles, diminishing peer networks, and an increased dependency on family and support services (Cornwell, Laumann, & Schumm, 2008; Burholt & Scharf, 2014; Heenan, 2011; Lin et al., 2014; Sawada, Shinohara, Sugisawa, & Anme, 2011). These life-course factors, combined with characteristics of the rural setting of climate, rugged terrain, and distance to social networks, resources and activities, can limit opportunities for social engagement, and may lead to social isolation (Burholt & Scharf, 2014; Heenan, 2011; Levasseur et al., 2015; Lin et al., 2014).

Social Isolation

Social isolation is a serious adverse health outcome directly associated with higher mortality (Holt-Lunstad, Smith, & Layton, 2010; Steptoe et al., 2015), and has been linked to physical inactivity (Reed, Crespo, Harvey, & Andersen, 2011), depression (Fukunaga et al., 2012; Merema, 2014), and suicide (Dautovich, Shoji, Stripling, & Dzierzewski, 2014) in rural and aging populations.

In research, social network measures have been used to identify deficiencies in social connectedness as an indicator of social isolation. Cornwell and Waite (2009) investigated social isolation using *The National Social Life, Health, and Aging Project* (NSHAP) data of 3,005 individuals, ages 57 to 85. They identified two central dimensions of social isolation: social disconnectedness, meaning physical separation from others due to a weak social networks and lower participation in social activities, and perceived isolation, defined as feelings of loneliness and a lack of social support (Cornwell & Waite, 2009). Social disconnectedness was measured by the network size, range, and frequency of interaction with family and friends, and the amount of participation in group meetings and volunteering (Cornwell & Waite, 2009). Networks

that were small or non-existent, geographically dispersed, or contained infrequent interaction indicated some level of physical separation from others (Cornwell & Waite, 2009).

Perceived isolation was related to the degree of relationships with family and/or friends, and was characterized by feelings of a lack of companionship, isolation, and being left out (Cornwell & Waite, 2009). Despite having similar numbers of connections as younger-older adults, oldest-older adults in the study perceived themselves as more socially isolated due to a perceived lack of support and feelings of loneliness (Cornwell & Waite, 2009). Cornwell and Waite (2009) caution making broad generalizations however, as social disconnectedness and perceived isolation are related but distinct; older adults may have low levels of social interaction and not feel lonely or socially isolated, and older adults who have a large social network may perceive a lack of social support and feel left out. Significantly, Cornwell and Waite's (2009) study found older adults with higher levels of social disconnectedness and perceived isolation had worse health, and as levels increased, self-rated health decreased, suggesting a relationship between social isolation and health, although causal pathways were not identified (Cornwell & Waite, 2009).

Further studies demonstrated the severity of social isolation is associated with social network size and social support, independent of depression, physical comorbidity, age, gender, living alone, employment status, and accommodation type (Dickens et al., 2011; Hawton et al., 2011). Rural older adults are even more likely to experience social isolation (Heenan, 2011; Sohini & Mishra, 2015). Stereotypes that rural older adults are buffered from loneliness and social isolation because of close knit community ties may

not always reflect current rural life (Feng, Ji, & Xu, 2013; Heenan, 2011). A majority of rural older adults experience some degree of loneliness and depression, and view these feelings as a fact of rural life, or an inevitable part of aging, that meant adjusting expectations of social contact and belonging to social networks (Heenan, 2011; Lin et al., 2014; Sinha, Shrivastava, & Ramasamy, 2013; Wu et al., 2010).

As greater proportions of older adults reside in rural communities, alleviating social isolation is vitally important. There is a need for health research that will aid in the development of interventions that will increase social connectedness (Heenan, 2011; Morris et al., 2014). Many rural communities lack resources and struggle to provide the types of health and community services needed to maintain older people's social and physical well-being (Warburton, Cowan, & Bathgate, 2013). The explosion of social networking technologies over the last decade offers an innovative way to enable and facilitate the social connectedness of rural older adults (Morris et al., 2014; Zickuhr, & Madden, 2012).

Social Networking Technology

A growing body of evidence suggests social networking technology can provide a way for older adults to create and sustain social relationships and participate in reciprocal information-sharing with others (Coelho & Duarte, 2016). To understand how online social networking sites (SNSs) can benefit older adults, researchers began studying Information and Communications Technology (ICT) in the mid-2000s, focusing on social applications, social networking site use, and the development of social network services (Coelho & Duarte, 2016). For the purposes of this study social networking site (SNS) use will be investigated.

Early studies in 2005 to 2008 focused on a variety of social applications that could assist older adults at home and in care to communicate and share user-generated content such as photos with their social networks (Coelho & Duarte, 2016). Overall, studies indicated a preference for family contacts over friends, and although phone calls were the preferred method for some types of information, SNSs were considered fundamental for social relationships in the older adults (Coelho & Duarte, 2016). Joinson (2008) followed these studies with the first investigation of a specific SNS. Based on a survey of Facebook (FB) users aged 15 to 66 years, seven uses and motivations were identified: social connection, shared identities, photographs, content, social investigation, social network surfing, and status updates. Social connection was the main motivation for use, and was negatively correlated with age (Joinson, 2008). Age was also negatively correlated with time registered on FB, time spent on the site, frequency of use, and number of friends on FB (Joinson, 2008). Despite the desire to socially connect, older users were less likely to access and spend time on FB (Joinson, 2008). The mixed age group and lack of representation of elderly in the study, however, limited the understanding of the patterns and motives of older SNS users.

Further studies by Karahasanovic et al. (2009) and Lehtinen, Näsänen and Sarvas (2009) examined new SNS users to understand the perceptions and process of older adult SNS use (Coelho & Duarte, 2016). Middle-aged adult internet users (58 to 66 years) in Lehtinen et al.'s (2009) study demonstrated familiarity with computers in the work setting did not translate to self-efficacy on SNS, and computers were viewed more as a work tool than a social tool. Phone calls, text messages, and email were preferred for social communication, especially when most of their friends and acquaintances were not

online (Lehtinen et al., 2009). Participants viewed SNSs negatively due to privacy and security concerns, usability problems, and perceptions that SNSs required intentional self-representation (Lehtinen et al., 2009). Reciprocity and the sharing of similar values and interests were considered the most important aspects of friendship, that researchers concluded could provide a strong motivation for learning how to use SNSs to build and strengthen social ties (Lehtinen et al., 2009).

Gibson et al.'s (2010) focus group of older adults aged 63 to 86 years expressed concerns about privacy and the desire to share information selectively, and similar to Lehtinen et al.'s (2009) study, viewed SNSs negatively as forums for public self-disclosure, and had little understanding of privacy options on the sites. Social networks were composed mainly of family and friends acquired through work or social activities and shared experiences, and having reciprocal social relationships was an important motivating factor to use SNSs (Gibson et al., 2010). Unlike other studies, the majority of older adults reported feeling comfortable and familiar with technology, and valued social relationships with friends and family, but did not embrace SNSs, preferring other modes of communication suited to their preferences and needs (Gibson et al., 2010). These findings suggest factors other than self-efficacy and privacy concerns influenced older adult use of SNSs.

In nursing, the *Women to Women Project* (WTW) at Montana State University College of Nursing delivered a research-based computer outreach intervention over 11 years, from 1997 to 2010, to help isolated rural middle-aged women cope with chronic conditions. The computer-based intervention was divided into three phases consisting of peer led virtual support and educational groups, health education led by nurses, and

teaching of basic computer literacy and internet research skills. Rural women in the study had significant improvements in self-esteem, social support, and empowerment, and non-significant differences in depression, loneliness, self-efficacy, and stress (Hill, Weinert, & Cudney, 2006). A further study by Winters, Cudney, and Sullivan (2010) found the computer-based social support group reduced psychological distress such as depression by 15% in 22 weeks in the rural women. Weinert, Cudney, and Hills' (2008) study indicated the intervention improved self-efficacy and reduced loneliness in the rural women, which improved their self-management and ability to cope with chronic illness. The researchers concluded the *WTW Project* computer-based intervention was an effective method of addressing education, and social support and connection needs.

Results of the *WTW Project* has implications for rural older adults at risk or suffering from social isolation, and suggests that computer-based technologies can be a useful tool for rural nursing practice related to older adult population, who are increasingly online.

As of 2015, approximately one third (35%) of older adults age 65 and older are using social media, compared with 2% in 2005, and more than half (56%) prefer Facebook, the most popular social media site online (Duggan, Ellison, Lampe, Lenhart, & Madden, 2015; Perrin, 2015). Despite the increase in older adult SNS use, however, not all online older adults are using SNSs. The *Pew Research Center's Internet & American Life Project* (2012) reported that half of American older adults are online, and 70% are using the internet or email, mainly to stay in touch with family (Zickuhr, & Madden, 2012). As of 2012, half (48%) of older adults had a desktop computer and one third (32%) used a laptop, and most had access to high speed connections at home

(Zickuhr, & Madden, 2012). In 2011, Facebook (FB) reported having over 500 million users, and that number has grown to over one billion users worldwide (Bell et al., 2013). Other popular SNSs include YouTube LinkedIn, Classmates.com, Pinterest, Twitter, and Match.com (Hutto et al., 2015). Although SNSs use has become widespread, most of the social networking sites are targeted to younger age groups under 50 or for specific audiences, without adaptations to fit the needs and preferences of older adults (Coelho & Duarte, 2016).

Summary

Global health agendas are focusing on social factors to address health inequities among rural older adults (IOM, 2004; USHHS, 2014; WHO, 2008). Social and environmental conditions of weather, distance, and isolation, socio-economic disadvantages, and age-related changes, can limit social networks (Nimrod, 2010), placing rural older adults at high risk for social isolation (Winters, 2014). The widespread use of SNS technologies such as Facebook provide an innovative tool that can overcome rural older adult barriers, and meet the need for social connectivity of this growing population. Despite the increase in popularity of SNSs and the valued application to connect with family and friends, however, only half of older adults online are choosing to use SNS (Duggan et al., 2015).

Research has indicated that negative perceptions of SNSs and differing cultural norms of online and offline behavior, as well as security and privacy concerns, have deterred older adult use (Coelho & Duarte, 2016). There is little research on ICTs and SNS use and non-use among older adult populations that can increase our understanding in order to develop effective interventions for this population (Morris et al., 2014).

Most of the research in this area has focused on younger populations, or mixed ages that only include younger-older adults. Different ages have different technological capabilities, needs, and preferences, and findings from studies of younger populations may not be generalizable to older populations (Coelho & Duarte, 2016). Studies of older populations have included people age 50 as older adults, assuming they have the same usage and motivations as older adults. Research has demonstrated different ages have different motivations and patterns of usage, but there is a lack of research to identify these differences (Zickuhr, & Madden, 2012). Despite the importance of considering contextual factors in research, there is a gap in research of rural older adult populations (Warburton et al., 2013).

Research Problem Statement

Despite the increase in older adult SNS use, the majority of Internet and SNS studies have focused on younger populations (Bell et al., 2013; Hutto et al., 2015), making it difficult to generalize findings and improve our understanding of the role SNSs can play in rural healthy aging (Nimrod, 2013). There is a scarcity of research that examines SNS usage and social networking in older adults (Hutto et al., 2015), and a gap in knowledge about older adult SNS use and non-use in the rural context. Approximately one third of older adults are using social networking technologies, but research is lacking in the uses and activities associated with it, that would enable healthcare practitioners to develop interventions with this application to increase social connectedness (Bell et al., 2013; Hutto et al., 2015; Perrin, 2015).

Purpose of the Study

The purpose of this study was to examine the characteristics and communication

behaviors of rural older adult social network site users and non-users, the relationship between age and network size, and the relationship between social networking users and non-users and social connectedness, after controlling for the effects of age, gender, marital status, employment status, income, and education among rural older adults, and to describe their perceptions of social networking site use.

Research Questions

To examine differences between SNS Users and Non-users, questions one through three examine demographic and computer-mediated variables of SNS Users and Non-users. Question four relates to Non-users' reasons not to choose SNSs. Question five examines SNS Users patterns of usage and preferences. Questions six and eight pertain to SNS use and social connectedness. Question seven is related to SNS Users and size of online social network. Question nine relates to the focus group.

1. a) What are the demographic characteristics of SNS users and non-users, and b) Is there a relationship between demographic characteristics of age, gender, race, marital status, education, and income among rural older adult SNS users and non-users?
2. Is there a difference in SNS users and non-users related to a) access to a computer, b) access to the internet, c) comfort with using the internet d) perceived importance of SNS, and e) privacy concerns among rural older adults?
3. Among the demographic and computer-mediated variables that have been shown to be significantly related to SNS users and non-use, what are the predictors of being a SNS user versus a non-user in rural older adults?
4. Why do some rural older adults choose not to use social networking technology?

5. Among rural older adults who are active SNS users: a) how do they typically access SNSs, b) what social networking technologies are used, c) what kind of personal information is shared, d) what type of content is typically posted, and e) what are the preferences for private or public communication among rural older adults?
6. Among rural older adults who are active SNS users, does social awareness, measured by a) preference for private or public communication, and social presence measured by b) number of months as a SNS user, c) frequency of use (hours per week), d) group membership size, and e) social network size, predict social connectedness?
7. What is the relationship between age and size of online social networks among rural older adult active SNS users?
8. What is the relationship between rural older adult SNS users and non-users with regards to social connectedness after controlling for age, gender, race, marital status, education, and income among rural older adults?
9. What are rural older adult perceptions of SNS use?

Assumptions

Over half of American older adults are online, and 35% are using social networking sites (Perrin, 2015), therefore it was assumed there would be sufficient numbers of older adults using social networking sites to participate in the study, despite small rural population sizes. It was assumed that rural older adults would agree to participate in the survey and the focus group discussion.

Limitations

A majority of research in healthcare has been performed with urban and suburban populations, and data collection and analysis premises may not be reliable when transferred to rural settings without adaptations (Pierce & Scherra, 2012). The social connectedness scale is population specific, and instruments that are developed for particular populations are subject to culture-bound assumptions (Sobczak, 2007). The social networking site survey was found online and adapted to include some questions from an older adult social media questionnaire, and therefore may pose a threat to reliability and validity when used in rural geographic regions for an older population (Pierce & Scherra, 2012; Sobczak, 2007).

Rural healthcare literature has demonstrated that rural residents often tend to resist outsiders (Pierce & Scherra, 2012). Rural older adults may resist participating in a research study conducted by a person that is not part of the community, which may have influenced their responses on the questionnaire and how they participated in the focus group discussion (Pierce & Scherra, 2012). The issues of a lack of anonymity as a characteristic of the rural setting, and “insider” connections consisting of referrals, may have increased snowballing sample collection, and could have affected data collection procedures (Pierce & Scherra, 2012).

Significance of the Study

According to the 2010 U. S. Census, the Western United States has the fastest growing population of older and oldest adults, and elderly populations in Idaho are steadily increasing, especially in rural areas (Werner, 2011). This study targets an important sector of the population, rural older adults, who have social and economic

disadvantages that place them at high risk for health inequities. This study will generate knowledge to close this gap, and act on a national health objective and research priority (WHO, 2008; IOM, 2004).

Although there have been numerous studies of social networking site use, few focus on older adult populations, and none within a rural context, creating a gap in knowledge of this population. This study will contribute to the field of knowledge of gerontology and healthy aging, by examining the role of social networking site use in the rural context.

An understanding of how social technologies can support social connectedness will inform healthcare providers, nurses, community leaders, public health stakeholders, and policy makers' decision-making for resource allocation, community health initiatives, and the development and design of interventions tailored to this populations. Results of the study will generate knowledge for rural nurses as to whether social networking site use is an effective tool in this setting, and can equip the rural nurse with an additional intervention to decrease the risk of social isolation, and improve care and health outcomes of rural elderly populations.

This study used a conceptual model to provide a framework from a nursing perspective of the phenomena of social connectedness and SNS usage. The study will generate a new application of the theory and broaden the understanding of the constructs of social connectedness, providing a theoretical foundation for nursing education, practice, and research.

This study indirectly measures healthy aging, an important national policy goal. Further research will add to our understanding of social issues related to aging in place in

the rural environment, and assist in tailoring nursing interventions to the specific needs and contexts in which older adults live and age, to promote healthy aging (NIA, 2011).

CHAPTER II

Literature Review

A literature review was conducted to examine relevant research on the topics covered in the present study. First, literature about characteristics of SNS use by older adults was discussed, followed by preferences and motivations of use and non-use. Next, traditional and social networking site methods of communication was examined. This was followed by an investigation of the barriers and challenges for elderly use of social networking sites. The benefits and effects of social networking use among older adults related to social connectedness was reviewed, followed by an examination of age and network size, and implications for older adults social networking use.

Method

Articles published between 2011 to 2016 were sought from the Medline, PubMed, CINAHL, and PsychINFO databases by entering the key terms ‘social media’, ‘social networking sites’, ‘Facebook’, ‘social networks’, ‘social connectedness’ ‘information communication technology’ ‘rural elderly’, ‘elderly’, ‘older adults’, and ‘seniors’. A manual search of published studies, research reports, book chapters, and review articles using combinations of the terms was also conducted. Studies were included if they were peer-reviewed journals, written in English, and reported empirical research of social media/social networking sites use and older adults. Extracted data was thematically organized and analyzed by categories of social media terms: SNS usage and non-usage, information communication technology and SNSs, social role satisfaction, loneliness and social media, and social connectedness and social media. The search yielded 2, 293 results, and 13 met inclusion criteria for review.

Literature Review

As a growing number of older adults are going online, and half of those are accessing social networking sites (Duggan et al., 2015; Zickuhr, & Madden, 2012), research has emerged to examine the way older adult populations use or do not use this technology.

Social Presence and Social Networking Sites

Previous studies had indicated that older adult SNS use was negatively correlated with age and primarily accessed to stay in touch with family and friends (Gibson et al., 2010; Joinson, 2008), and having reciprocal social relationships was an important motivating factor to use SNSs (Gibson et al., 2010). Recent studies have confirmed this trend, and indicate age is negatively correlated with information and communication technology (ICT) use (Vroman, Arthnat, & Lysacks, 2015) and significantly associated with SNS use (Hope, Schwaba, & Piper, 2014; Hutto & Bell, 2014; Hutto et al., 2015). A study by Hutton et al. (2015) comparing Facebook (FB) users and non-users among adults age 51 to 91, reported younger-older adults (mean age 66 years) were more likely to be FB users than oldest-older adults (mean age 74 years). This was consistent with a previous study by Bell et al. (2013) with individuals 50 years and older that revealed age was a significant predictor of FB use, but race, gender, income, and education were not, although females were more likely to use FB than males (Bell et al., 2013).

Although studies have shown married, educated, female, and younger older adults tend to be FB users (Bell et al., 2013; Hutto & Bell, 2014; Hutto et al., 2015), comparatively few studies have demonstrated statistically significant differences of gender, race, education and income between older adult SNS users and non-users. The

studies defined race as Caucasian or non-Caucasian, and the samples were primarily Caucasian, which limits ethnic interpretations of FB use. The individuals in the studies were 50 years and older, which may have increased the likelihood of finding a significant difference in age between FB users and non-users.

Results of Vroman et al.'s (2015) study of Internet and FB users indicated younger-older adults with a higher education and/or living with a spouse or partner increased the likelihood of using ICTs and SNSs (Vroman, Arthnat, & Lysacks 2015), but found no significant difference in use by gender, although few in the study were SNS users. The Pew Research Center statistics support these findings, and as of 2015, report that although American older women are more likely than older men to use SNSs, the difference is not statistically significant, and the gap is narrowing as more men are using social media (Perrin, 2015). American older adults who have a higher education (some college experience) and higher household income are also more likely to use social media (Perrin, 2015).

No significant difference in race between users and non-users has been found in prior studies, as sample populations were primarily Caucasian, however, SNS use has been shown to be similar among White, African-American, and Hispanic races in the U.S. (Perrin, 2015). Although the Pew Research Center reports that American rural residents are less likely to use SNSs than urban and suburban residents, (Perrin, 2015), there is a gap in research of rural older adult SNS use to confirm this trend.

Self-Efficacy with Technology

Previous studies demonstrated there is a significant difference between SNS users and non-users' ability and attitudes towards ICTs, that present barriers for SNS use. Older adults who felt more confident using new technology and perceived more benefit were more likely to be FB users (Bell et al., 2013; Hutto et al., 2015), and active users had more confidence using technology than non-users (Bell et al., 2013; Hutto et al., 2015). Half of the older adults in a study by Vroman et al. (2015) who were occasional or non-users of ICTs and SNSs, viewed them as "frustrating", "intimidating" and "anxiety provoking." The Pew Research Center reports a majority of American older adults feel they need assistance learning new digital devices, and even among online older adults, 56% feel they would still need assistance to use SNSs (Smith, 2014).

Not surprisingly, Internet and social media use decreases after age 75 in the "G. I. Generation" (age > 75 years) (Zickuhr & Madden, 2012), and as of 2014, 47% of oldest-older adults use the internet and 37% have high-speed broadband connection at home (Smith, 2014). The Pew Center reports few among this age are likely to start using the internet without some assistance and encouragement, and have attributed this to a lack of 'self-efficacy'; the belief that they did not feel knowledgeable and confident enough to use the technology, and a lack of 'perceived relevancy'; most U. S. older adults stated lack of interest was the main reason for not using the internet (Zickuhr, & Madden, 2012). Only four percent of non-Internet users in the older-old category expressed interest in using the Internet and email in the future (Zickuhr, & Madden, 2012).

Motivations for Social Presence on Social Networking Sites

Social networking site use depends not only on older individuals' physical and psychological capabilities, but also on their motivations to use it (Siriaraya, Ang, & Bobrowicz, 2014). SNSs were primarily used to stay connected with friends and family (Bell et al., 2013; Goswami et al., 2010; Hope et al., 2014; Hutto et al., 2015), especially with younger family members who were active on the same SNSs (Hope et al., 2014), indicating SNS use is beneficial for intergenerational social connectedness. Staying connected with colleagues and acquaintances and meeting new people provided a low motivation to use SNSs (Bell et al., 2013; Hope et al., 2014; Hutto & Bell, 2014; Hutto et al., 2015). However, Vroman et al.'s (2015) study found that the motivation to stay in touch with family and friends translated into a preference for using email rather than SNSs.

A qualitative study by Hope et al. (2014) of 22 older adults aged 71 to 92 years found that despite being well educated, active in their communities, and having access to computers and Internet, only one third used SNSs, although they expressed interest in improving communication with their social network. Researchers concluded using SNSs to form and maintain social ties was not viewed as important by this generation, in contrast to younger age groups (Hope et al., 2014). Computer use was viewed as a dedicated activity or hobby, and/or a social practice, and similar to the Pew Research Center findings, older adults had diverse technical ability and experience with computers (Hope et al., 2014).

Older adults' children can have an influence on older adults to use SNSs as a means of communication among family members (Bell et al., 2013; Goswami, Köbler,

Leimeister, & Krcmar, 2010; Hope et al, 2014), although social pressure was not a predictor of use (Braun, 2012). Older adults have different motivations for using ICTs and SNSs, and are less influenced by social trends and peers than younger users (Hutto et al., 2015; Vroman et al., 2015; Zickuhr & Madden, 2012).

Intrinsic motivations, such as positive attitudes and personalities, perceived benefits of physical and emotional independence, and satisfaction with the activity, also influenced SNS use (Vroman et al., 2015). The perceived importance of the activity also motivated older adults, and if the activity had no value, they were less likely to use it, and more likely to view ICTs and SNSs negatively (Vroman et al., 2015). SNS (FB) users had more favorable attitudes towards ICTs (Hutto et al., 2015), and moreover, reported ICTs had more impact on their life compared to non-users (Bell et al, 2013). Braun's (2012) study of 124 Internet experienced adults, aged 60 to 90, supported these findings, and results indicated greater perceived usefulness and trust of SNSs, and frequent internet use, were significant predictors of SNS use.

Social Presence and Communication on Network Sites

As of 2014, 59% of older adults go online, and 47% have a high-speed broadband connection at home (Smith, 2014). A majority of SNS users in the studies reported having a home computer or lap top to access SNS, and less than half used their phone or tablet (Hope et al, 2014; Hutto & Bell, 2014; Hutto et al., 2015), and few used a public computer (Hope et al, 2014; Hutto et al., 2015; Hutto & Bell, 2014), possibly due to unfamiliarity with other computers or convenience. Most logged in at least once a week, and almost a third logged in to FB daily (Hope et al, 2014; Hutto et al., 2015), primarily to connect with family and friends (Hutto et al., 2015).

In a qualitative study by Goswami et al., (2010) five features of older adult SNS use were identified: a) ‘self-presentation’ (i.e., creating a profile and using different profile settings, deciding on the amount of information to share, setting privacy level), b) ‘managing social network’ (sending and accepting friend requests, searching for friends, inviting people to join the network, forming and joining groups), c) ‘communication’ (chatting, text messaging, commenting on other people’s profiles), d) ‘content sharing’ (uploading photos and videos, links to other information) and e) ‘awareness sharing’ (updating emotional or situational states such location information, activity information, likes and dislikes).

Despite concerns about privacy and security, older adults SNS users were comfortable with ‘self-presentation’, putting personal information on FB such as profile pictures, education, gender, birthday, work, and family information, but were less likely to report religious and political views, and sports events (Bell et al., 2013; Hutto et al., 2015), although some oldest-older adults did not feel SNSs were a place to discuss religious or political views (Hope et al., 2014). Content sharing of family events, travel, and observations and things that interested them were more popular than political issues, sports events, and games scores (Hutto & Bell, 2014). Most older adults used FB primarily to connect with family and friends, and less with acquaintances, colleagues, and strangers while on SNSs (Bell et al., 2013; Hutto et al., 2015).

Studies varied on older adults’ private and public communication preferences. Some studies noted that over half of older adult SNS users preferred public postings due to ease and quicker response times, compared to sending private messages (Hutto & Bell, 2014; Hutto et al., 2015), while another study indicated oldest-older adults SNS users

preferred one-on-one communication or private broad communication for important life events to a select list on their social network (Hope et al, 2014), suggesting that preferences vary within segments of the older population.

Age and Social Network Size

Not surprisingly, age and size of social networks among SNS users were significantly related, and oldest-older adults had significantly smaller social networks than younger-older adult SNS users (Hutto & Bell, 2014; Hutto et al., 2015). This online trend is consistent with older adult social networks offline, as older adults tend to have smaller social networks and fewer non-primary group ties as they age (Cornwell et al., 2008). The researchers found no relationship between age and network density, rather it was the frequency of interaction with network members that increased closeness with others (Cornwell et al., 2008), suggesting SNSs may be beneficial to strengthen social ties as older adult networks shift later in life.

Non-users of Social Networking Sites

Several reasons for not using SNSs were reported in the literature. Lack of interest, time, and/or access to a computer were the main reasons for not using SNS (Hope et al., 2014; Hutto & Bell, 2014; Hutto et al., 2015). Non-users who didn't have access to a computer at home did not access one at public sites, citing lack of skill or time, but expressed interest in learning (Hope et al., 2014; Hutto & Bell, 2014; Hutto et al., 2015).

SNS users and non-users expressed concerns about security and privacy, and some cited it as a reason they stopped using SNSs (Hope et al., 2014; Hutto & Bell, 2014; Hutto et al., 2015). Non-users were more concerned with privacy and security than users,

due to difficulties accessing privacy settings, receiving frequent unsolicited emails, fear of social blunders, a desire for partial anonymity, and mass distribution of messages on SNSs (Norval, Arnott, and Hanson, 2014; Xie, Watkins, Golbeck, and Huang, 2012).

Lack of understanding among oldest-older adults about public versus private information and privacy settings on SNSs were also reasons not to use SNSs (Hope et al., 2014). A study by Xie et al. (2012) demonstrated educational strategies that addressed concerns and use of SNSs, and made them personally relevant, increased willingness to use SNSs. These findings suggest that as older adults become more familiar with SNSs, they will be more inclined to use it as part of daily life (Xie et al., 2012; Zickuhr, & Madden, 2012).

Some older adults viewed SNS participation as starting new social relationships that would require maintenance and expectations of reciprocity in communication (Hope et al., 2014). Content posted from weak ties or social contacts who are seen infrequently were also viewed as unimportant or trivial by oldest-older adult SNS Users (Hope et al., 2014).

Negative perceptions of SNSs also occurred due to differing cultural norms of behavior, as SNSs require an informal type of social interaction, self-disclosure, and self-representation that may be different from offline behaviors and social norms for this population, especially for oldest-older adults (Leist, 2013).

Older adults are skeptical about the benefits of technology. The Pew Center reports older adults who do not use the Internet are divided on whether less access to information is a disadvantage (Smith, 2014). In a study by Hope et al, (2014), older adults did not view the ability to view official news stories (broadcasting) as a benefit of

social media, and regarded posting on SNS as slanted and untrustworthy (Hope et al., 2014).

Poor vision and other age-related issues were also barriers to using Internet and SNSs (Bell et. al, 2013; Hutto et al., 2015; Vroman et al., 2015). The Pew Center reports two in five seniors have physical conditions or health issues that make it difficult to read or use new technologies, and are less likely than older adults without physical challenges to go online, have broadband at home, or own most major digital devices (Smith, 2014). These obstacles are slowly being overcome by improved designs and programs and assistive technologies such as screen readers and Braille displays (Siriaraya et al., 2014).

Social Awareness and Role Satisfaction and Loneliness

Recent studies have examined the association of SNS use and health. Although studies did not find a significant difference in loneliness between SNS users and non-users, loneliness was correlated with age, and older adults in the study perceived themselves as less lonely (Bell et al., 2013; Hutto et al., 2015). However, Hutto et al 's (2015) study demonstrated high frequency FB users who used directed and passive types of communication had less perceived loneliness than other FB users (Hutto et al., 2015), suggesting the way in which SNSs are used can play an important role in maintaining and improving mental health.

Although FB use was not associated with loneliness, studies revealed a significant relationship with social role satisfaction. Older adult FB users were more satisfied with their social roles than non-users, and direct communication interventions were more successful to improve social role satisfaction (Bell et al., 2013; Burke et al., 2011; Hutto & Bell, 2014; Hutto et al., 2015). Social role satisfaction was defined as the “perceived

ability to do routine tasks associated with being social and meeting the needs of their friends and family” (Hutto et al., 2015, p. 73). Cornwell et al. (2008) suggest the emphasis on social roles and activity stems from continuity and activity theories that are based on the belief that older adults are used to certain social roles and activities and try to maintain them through life transitions (Cornwell et al., 2008). Adults who adjust to later-life transitions by remaining socially active or satisfied with their social roles are happier and healthier, thereby measuring healthy aging (Cornwell et al., 2008). Hutto et al. (2015) used this measure of satisfaction with roles and activities in their social networks to measure social connectedness.

Traditional versus SNS Communication

Many older adults expressed concern that SNS usage would replace traditional forms and face-to-face interaction (Hope et al., 2014; Hutto et al., 2015). However, Hutto et al. (2015) reported that after controlling for demographic variables, familiarity with FB, and social network size, users and non-users had the same frequency of traditional communication channels. Similarly, Jansson’s (2015) study indicated older adult SNS users had more regular social interaction than non-users, and those without regular interaction were more likely to go online. These findings suggest SNS use augments rather than replaces traditional forms of communication, and can increase social interaction for older adults with small social networks.

These findings may not reflect older adults’ communication preferences, however. Several studies indicated older adults preferred traditional forms of communication even if they were SNS users, through telephone calls, emails and written letters (Hope et al., 2014; Hutto & Bell, 2014). Older adults showed a preference for telephone calls because

of their dynamic nature that better approximated a “real conversation” (Hope et al., 2014), and convenience and ease of use (Hutto & Bell, 2014). For oldest-older adults, letter writing was viewed as an art, hobby, and/or social practice for strengthening and renewing social ties, and allowed the author to set the tone and content of the communication (Hope et al., 2014). Older adults who had large social networks close by also preferred traditional means of communicating by letter or telephone, although some non-users felt SNSs might be easier as health diminished (Hutto et al., 2015).

Social Connectedness

The Pew Center reports that U.S. older adults who are online and use SNSs such as Facebook socialize more frequently (81%) in person, online, or by phone, on a daily basis, compared to online older adults who do not use SNSs (71%), and those who are not online (63%) (Smith, 2014).

Summary

Literature of older adult SNS use and non-usage was reviewed to identify the communication patterns and behaviors of this population in order to determine the potential for interventions using SNS tools. Literature demonstrated the older the adult, the less likely they are to access SNSs, and the smaller their social network size (Hutto & Bell, 2014; Hutto et al., 2015). Older adults who do not use Facebook or other SNS are more likely to be older and prefer traditional methods of communication, and lack of access and ability to use a computer, as well as negative perceptions of SNS increase the likelihood of not using SNSs (Bell et al., 2013; Hope et al., 2014; Hutto & Bell, 2014; Hutto et al., 2015).

In general, older adults are primarily motivated to use SNSs to stay in touch with friends and family, and are less interested in forming new social relationships, citing lack of relevance, time, and interest in maintaining weak ties (Bell et. al, 2013; Hutto & Bell, 2014; Hope et al., 2014). While most of the social functions performed by older adults can be done on SNSs, most prefer traditional methods of communication such as phone calls, letter writing, and email, that will provide control over the content and distribution of the message, and immediacy of reciprocal communication (Bell et. al, 2013; Hope et al., 2014; Hutto & Bell, 2014; Hutto et al., 2015). Not all SNS activities are the same, and different types of activities affect older adults' social connectedness and social role satisfaction differently (Burke et al., 2011; Hutto et al, 2015).

The majority of studies have lacked differentiation between middle age and older adult populations, assuming different ages have the same motives and perceptions and usage of SNS. Different age groups use and experience SNS differently, making it difficult to generalize findings and understand the role social media plays in the social connectedness of (Burke, Kraut, & Marlow, 2011). Research of older adult populations are needed to identify the needs, preferences, and communication behaviors specific to this population, in order to develop targeted interventions tailored to this population.

Use of social media is culturally influenced (Janson, 2015). Current studies have focused on metropolitan older adults, and there is a gap in literature regarding rural older adults that can provide a sociocultural perspective of SNS use (Bell et al., 2013; Hutto et al, 2015). Nursing research in this area will increase our understanding of the needs and preferences of older adults and SNS within a cultural nursing context to guide the development of targeted nursing interventions to facilitate social connectedness

specifically for rural older adults (Janson, 2015; Hutto et al, 2015; Nimrod, 2013). This study used a mixed-method approach of quantitative and qualitative design to enhance the understanding of SNS use in the rural context.

Few of the studies are based in theoretical frameworks, leading to a variety of diverse terminologies, approaches, and applications in literature, making it difficult to generalize findings and further nursing knowledge in this area. Various studies measured social capital, loneliness, and social role satisfaction, which limits understanding as to whether SNSs can increase social connectedness, which has been linked with improved health outcomes. Finding evidence that will support the use of social media to improve social connectedness will be beneficial for gerontologists, healthcare practitioners, policymakers and other stakeholders.

Approximately half of online older adults are using SNS, but research is lacking in the uses and activities associated with it, that would enable healthcare practitioners to develop interventions with this application to increase social connectedness (Bell et al., 2013; Hutto et al., 2015; Zickuhr, & Madden, 2012). This study will add to the general body of knowledge of the role that SNS play in supporting social connectedness, for nursing practice, education, and research.

Theoretical Framework

Theoretical Model of Social Connectedness

Social Capital Theory has been adapted by Riedl, Köbler, Goswami, and Krcmar (2013) as a theoretical Model of Social Connectedness to measure social awareness, social presence, and social connectedness of Twitter users from all age groups over a two-month period in 2011.

The model is based on the concept of social capital, the belief that benefits that accrue to individuals and groups due to social interaction act as a motivation for establishing and maintaining social connections (Riedl et al., 2013). Online social network sites enhance users' social capital by providing a means for developing, maintaining, and strengthening social connections (Riedl et al., 2013). Social capital that emerges from the use of modern information technology is referred to as socio-technical capital, a result of users' technology usage behavior (Riedl et al., 2013). The Model was adapted to incorporate the functional and structural characteristics of people's communication behavior within an online social network (Riedl et al., 2013). The authors theorize that relationships between the constructs of social presence, social awareness, and social connectedness are influenced by the users' network size and frequency of use (Riedl et al., 2013). See Figure 1 below for a depiction of the Model concept, constructs, and relationships.

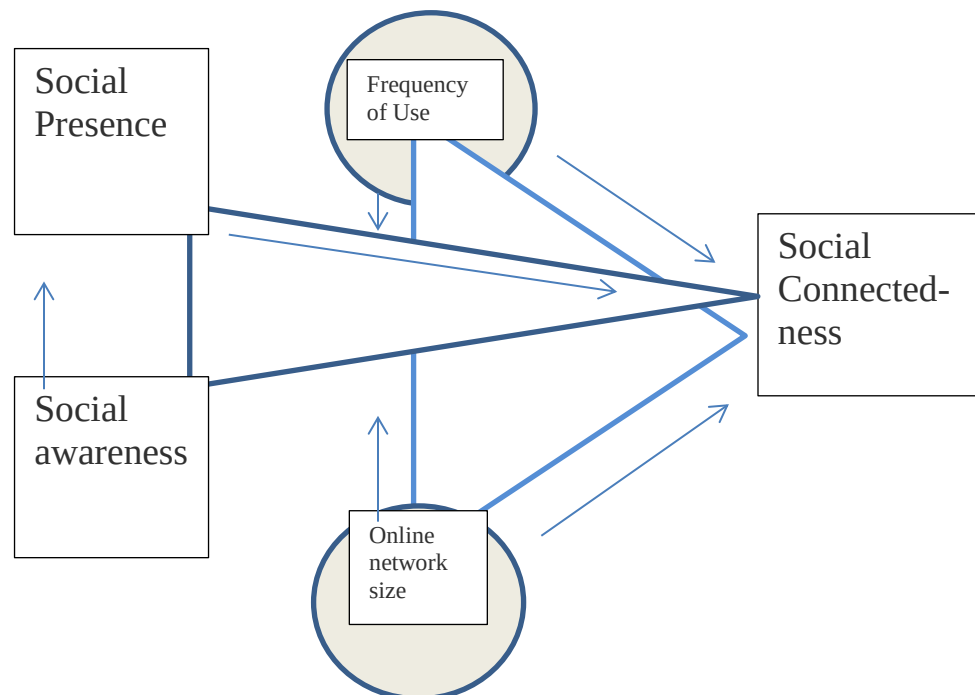


Figure 1. Riedl, Köbler, Goswami, and Krcmar's (2013) Theoretical Model of Social Connectedness.

Social connectedness. Social connectedness is defined as an individual's attitude and relationship to society that offers subjective benefits such as intimacy, sense of sharing, and stronger group attraction (Riedl et al, 2013). Individuals can assess their social relationships based on the extent to which they feel socially connected, a desirable property for individuals to achieve, and therefore, a source of social capital (Riedl et al, 2013). The outcome of social connectedness is social isolation or social integration, and the benefits of social capital can be either psychological, emotional, or economical (Riedl, et al., 2013). Social connectedness can be viewed as an estimator of the quality of an individual's social network and a precursor to social capital, or directly linked to social capital itself. The extent to which network members can appropriate social capital from the social network will be determined by their connectedness within the network (Riedl et al, 2013).

Social awareness. Social awareness is defined as "an understanding of the activities of others, which defines one's own activities", and relies on knowing the (social) context of an individual (Riedl et al, 2013, p. 673). On a SNS, users are conscious about the activities of other users of the SNS, facilitated by the properties of the SNS, or by the way they choose to communicate on it (Riedl et al, 2013). For individuals, social networking sites can provide an awareness and continuing knowledge of the lives and activities of their family and friends, and through this process, generate feelings of closeness and strengthen family ties (Cornejo, Tentori, & Favela, 2013). Older adult users of SNS can explicitly choose who is aware of their activities by the content they share and the method they use to communicate, either publicly or privately, and actively or passively (Cornejo et al., 2013).

Social presence. Social presence is defined as “the psychological connection that users feel among each other after an interaction...described as a temporary judgment...as augmented or limited by the medium,” and is a prerequisite for effective communication (Riedl et al, 2013, p. 674). Applied to SNS, it is the user’s actions that signal the sense of “being there”, an immediacy of presence that is used to create intimacy or enhance the feeling of social presence (Riedl et al, 2013, p. 674).

The use of traditional or non-traditional modes of communication can influence the feeling of immediacy by asynchronous activities such as posting online or emailing, or synchronous activities such as video or live chat options (Kaplan & Haenlein, 2010). Intimacy that is interpersonal, such as face-to-face conversation, can enhance social presence more than mediated telephone conversations, and will influence other’s communication behavior (Kaplan & Haenlein, 2010). For SNS users, the degree of self-disclosure and the type of self-presentation also contribute to social presence, and is dependent upon the content the SNS user posts, and the medium used (Kaplan & Haenlein, 2010). Virtual game worlds yield the highest social presence, in comparison to Facebook and other similar social networking sites, that allow higher social presence than blogs (Kaplan & Haenlein, 2010).

Relationships. Social presence and awareness are interconnected; the user is aware of the presence of social ties, and feels a general sense of being connected. The SNS is the medium that allows a mutual awareness of a sense of social presence (Riedl et al, 2013, p. 674). Social awareness and social connections are interrelated, and the SNS properties enhance the awareness of the availability of others in the network, creating and maintaining a sense of social connectedness (Riedl et al, 2013, p. 674). Social presence

and social connectedness are interrelated as well, and increased perceptions of social presence among SNS users will enhance the feelings of social connectedness among them (Riedl et al, 2013, p. 674). All three constructs are interrelated, and social awareness acts as a building block for the higher-level constructs of social presence and social connectedness, whereas social presence acts as a mechanism through which the positive effect of social awareness on social connectedness is realized (Riedl et al., 2013).

Structural properties. In the Model, two structural properties characterize people's social network: network size and frequency of usage, and they have a moderating effect on social presence, social awareness, and social connectedness (Riedl et al., 2013). Network size and frequency of usage will moderate how socially connected a person feels, and the social awareness of the user at any point in time (Riedl et al., 2013). In other words, a person feels more socially connected because of the awareness of others' activities (Riedl et al., 2013). Network size and frequency of usage will also moderate the relationships between social awareness and social connectedness (Riedl et al., 2013). Social connectedness is influenced by both the functional and structural characteristics of the social network, and the communication among individuals within the network (Riedl et al., 2013).

Functional properties. Functional properties are subjective perceptions by the individual of the availability and adequacy of resources that can be obtained from SNS, such as social support and social connectedness, and generate social capital (Riedl et al., 2013). Functional properties of SNS usage and subjective properties of communication behavior influence the relationships of the constructs of social connectedness, social awareness, and social connectedness (Riedl et al., 2013). The Model was tested by the

authors on 121 Twitter users of all ages, and most of the results supported the Model; social awareness, social presence, and usage frequency had a direct effect on social connectedness, however network size had only a moderating effect. Surprisingly, a larger network size increased social awareness, providing an indirect effect on social connectedness (Riedl et al., 2013).

CHAPTER III

Methodology

The purpose of the present research was to investigate the characteristics of rural older adult social network site users and non-users, the relationships between rural older adult age and network size, and the relationship between them in regards to social connectedness, after controlling for age, gender, marital status, employment status, income, and education, and to describe their perceptions of social network site use.

Research Design

This study was a mixed method qualitative and quantitative cross-sectional descriptive and inferential study, using standard survey methods of paper and pen questionnaires for data collection, followed by a focus group discussion. Institutional Review Board (IRB) approval was obtained. The variables under consideration were demographics, social connectedness, and social network site use.

Setting

The study was limited to eight rural Southeast Idaho counties. *Rural* was classified as low population density, physical remoteness, and small aggregate size of less than 55,000 people, or clusters of less than 2,500 people (IOM, 2004). Rurality, for this study, was operationally defined as those living in Idaho non-metro counties, coded as 7 (urban population of 2,500-19,999, not adjacent to a metro area), 8 (complete rurality or less than 2,500 urban population, adjacent to a metro area), or 9 (complete rurality or less than 2,500 urban population, not adjacent to a metro area) (U.S. Department of Agriculture, 2013).

Participants

The RUCC classification 7-9 was used as inclusion criteria to designate rural county residents. Inclusion criteria were: a) adults aged 65 years or older b) able to read and understand English, c) able to understand the purpose of the study and give informed consent, and d) were rural residents. Exclusion criteria were: a) persons residing in nursing homes, prisons, or other non-residential settings, b) not residing in a rural-designated county, c) persons with a medically diagnosed impaired cognition that would prohibit understanding of the questions, such as dementia or Alzheimer's, and d) under the age of 65 years. To avoid selection bias, each person was asked to participate.

Sampling

Convenience sampling was utilized to obtain the sample. The target population was 350 rural community-dwelling adults, ≥ 65 years of age, residing in a rurally-designated county in Southeast Idaho. Focus group participants were available respondents from the sample willing to participate. The target sample size was 350 per *a priori* calculation with G*Power for a medium effect size of .15, $\alpha = .05$, Power $(1-\beta) = .80$. The focus group participants were composed of six rural older adults age 65 years and older who were willing to participate.

Recruitment Strategies

The target population was selected from senior centers, community events, health fairs, grocery stores, churches, libraries, hospitals, doctors' offices, and clubs located in towns in the rural counties. Promotional activities to gain interest and increase response numbers included a) displaying posters of introduction and an explanation of the study to potential participants in public places with the date time and location of the surveys, b)

posting and handing out flyers in public places with the introduction of the study and dates, times, and locations to fill out the survey, and c) identifying places to conduct interviews and focus group discussions. The Southeast Idaho Resource Directory, Idaho Senior Living Council, The Southeast Idaho Area Agency on Aging, and Chamber of Commerce were also utilized for contact information. Involvement of local community leaders throughout the recruitment process yielded further contact with community individuals and groups.

Senior centers were identified in each of the rural counties, and emails were sent to the directors asking for permission to speak with them about the study, and recruit participants. Permission was granted to visit the senior centers and after explaining the study, potential participants were asked to fill out the questionnaire. Approximately 320 flyers were sent home with 'Meals on Wheels' to all of the homebound individuals in the program. Seniors at the center were asked for referrals to other social groups and individuals. Two visits were made to each senior center on different days. Hospital administrators and doctors were contacted, and permission was granted to approach older adults in waiting rooms.

Recruitment goals were to obtain a sample large enough to support inferential statistical analysis and ensure a representative sample. The specific recruitment goals were: (a) ensuring an adequate sample of participants, (b) enticing randomly selected rural residents to participate in the interview, and c) obtaining a sample of participants to participate in the focus groups discussion that adequately represented the population.

Procedures

The participants were given an informed consent and data confidentiality agreement letter to sign, describing the purpose of the study, the survey, and directions for completing the survey. The survey was printed out in 14 Font size. A small table and chairs were set up or already in place in quiet, comfortable areas at stores, libraries, community centers, and other public places for participants to sit while completing the survey. Two assistants were on hand to assist participants with the questionnaire and answer questions, and participants were given enough time to thoughtfully answer the questionnaire without feeling rushed or stressed.

Focus Group Procedures

Participants were asked to participate in a focus group discussion when filling out the questionnaire. Assistants were selected prior to the study to assist with the focus group discussion procedures and analysis. Prior to the discussion, a quiet, comfortable room was selected in a senior center. The recorder was set up and prepared, and a round table was used to facilitate the discussion. Beverages were provided.

The discussion started with a welcome, followed by introductions, and then guidelines were discussed. The group was informed of the recording of the discussion, and the role of the moderator. Following the introduction and explanation the study, each participant signed the confidentiality agreement and informed consent. The discussion started with an open-ended question, further questions were asked as needed to generate discussion, and the meeting concluded with a summary, opportunities for further questions, and closing remarks.

Data Collection Methods

Data Collection. Quantitative data was collected using a paper and pen structured survey questionnaire divided into three parts. The questionnaire investigated: 1) the characteristics of social networking site users and non-users among rural older adults, 2) common activities of rural older adults who use SNS, and 3) the social connectedness among rural older adult users and non-users of SNS. Part one included demographic data related to age, gender, race, marital status, education, and income. Part two was a Social Network Site Use survey to assess characteristics of social network site users and non-users, and their communication behaviors. Part three consisted of questions from The Social Connectedness Scale - Revised. Approximately 15 minutes was needed to complete the questionnaire. Permission was obtained for use of all instruments from the scale developer. Qualitative data was obtained by focus group discussion with six participants, to learn how rural older adults talk about social media use. The participants were asked open ended questions such as: *Do you use the Internet or social media? What do you like or dislike about social media?* to further understanding of the quantitative data about rural older adult social network site use.

To ensure efficient administration of the questionnaire, the researcher stayed with the participant as they filled out the questionnaire in chosen public places, and obtained informed consent and data confidentiality agreement signatures.

Instrumentation

1. Demographic Questionnaire:

Demographic characteristics differentiating social media users from non-users among rural older adults was obtained. Demographic variables collected were: 1) age,

2) gender, 3) race, 4) marital status, 5) education, and 6) income. See Appendix A-1 for the demographic questionnaire.

2. Social Networking Site Survey:

A social networking site survey retrieved from an online social networking site questionnaire from SurveyMonkey (n.d.) was used, and included twenty-three questions. Participants choose from a number of responses, and some questions allow more than one response. Questions 1 through 9 are for SNS users and non-users, and assess computer and internet access, as well as perceptions and barriers for social network site use and include questions such as: *“Do you own or have access to a computer?”*; *“Are you a member of an online Social Networking Site?”*; *Do you think online Social Networking Sites are important?”* Questions 10 through 23 are for Social Network Site users only. Questions 10 to 13 assess types and typical means of accessing SNS, influence to access SNS, and length of time registered, and include questions such as: *How do you access your online Social Networking Site account?”* Question 15 assesses frequency of use in hours per day spent on SNS. Questions 16 to 19 assess social networking composition and size, and motivation to use SNS, and include questions such as: *“Which of the following are you connected to, friends with, or follow on the online Social Networking Sites?”* Questions 20 and 21 assess types of information shared and typical content posted. Question 22 assesses public/private communication preference. Question 23 assesses self-reported effects of SNS use on traditional face-to-face communication. See Appendix A-3 for the Social Networking Site survey.

3. Social Connectedness Scale – Revised (SCS-R):

This scale measures social connectedness as a psychological sense of belonging, a knowledge of an unchanging interpersonal closeness with the social environment (Lee & Lee, 2001). It emphasizes an independent sense of self in relation to others. The SCS-R does not measure belongingness in the form of group memberships or loss of specific relationships (Lee et al., 2001). The SCS-R consists of 20 items on a 6-point Likert scale (1 = strongly disagree to 6 = strongly agree). There are 10 positively worded and 10 negatively worded items. The positively worded items characterize feeling a sense of closeness with others, and maintaining and seeking connection. Examples include: "*I am able to connect with other people*," "*I am able to relate to my peers*" (Lee & Lee, 2001, p. 312). The negatively worded items describe the feelings of distance and isolation from others. Examples are: "*I don't feel related to most people*", "*I feel like an outsider*" (Lee & Lee, 2001, p. 312). The negatively worded items are reverse scored and added together with the positive scores, and a range of scores from 20 to 120 is possible. A stronger sense of social connectedness is reflected in a higher score (Lee & Lee, 2001). An item mean score with a possible range from 1 to 6 can also be calculated by dividing the total scale score by 20 (or the number of scale items). A mean item score equal to or greater than 3.5 (slightly agree to strongly agree) indicates a greater tendency to feel socially connected (Lee & Lee, 2001).

The scale has been shown to have good internal reliability with a Cronbach's alpha coefficient of .92 to .94, and appropriate convergent and discriminant validity (Lee & Lee, 2001). Another study demonstrated the SCS-R had good internal and external consistency, and good construct and criterion validity, with an internal item reliability of

Cronbach's alpha of .88 (Capanna et al., 2013). Test-retest reliability of the revised version was not examined in these studies (Capanna et al., 2013; Lee & Lee, 2001). See Appendix A-2 for the Social Connectedness Scale.

Data Collection

The data was collected for three months in the Fall. Questionnaires were collected and entered into a spreadsheet. An assistant checked the results for accuracy, and then a random spot check was conducted on the data to verify accuracy. Missing cases were re-checked to verify they were missing.

Data Analysis

The following research analysis was done for each of the research questions:

1. a) For demographic characteristics of SNS users and non-users among rural older adults, a descriptive statistical summary of numbers, mean, sum totals and percentages was obtained, as well as a bar graph to visualize the data, using SPSS version 24.0. b) For relationships between demographic characteristics of age, gender, race, marital status, education, and income among rural older adult SNS users and non-users, an inferential statistical Pearson's Chi-Square test of association was conducted using SPSS version 24.0. Each of the demographic categories were converted to the following dichotomous variables: age (65-75years/75+), gender (male/female), race (Caucasian/non-Caucasian), marital status (partner/no partner), education (high school/college) and income ($\leq$ \$49,999, $>$ \$50,000).
2. For differences in SNS users and non-users access and ability to use technology, a descriptive statistical summary of numbers, mean, sum totals and percentages

was obtained, as well as a bar graph to visualize the data, followed by an inferential statistical Pearson's Chi-Square test of association for each of the variables: access to a computer (yes/no), internet at home (yes/no), comfortable using the internet (yes/no), perceived importance of SNS (yes/no), and privacy concerns (yes/no), using SPSS version 24.0.

3. For identification of demographic and computer-mediated variables that are predictors of SNS use and non-use, an inferential logistical regression analysis was conducted using the SPSS version 24.0 program.
4. For reasons' rural older adults choose not to use SNS, a descriptive statistical summary of numbers and percentages was obtained, as well as a bar graph to visualize the data, using SPSS version 24.0.
5. For social awareness measured as: a) access of SNSs, b) SNS used, c) personal information shared, d) type of content posted, and d) preference for private or public communication, a descriptive statistical summary of numbers and percentages was obtained, as well as bar graphs to visualize the data, using SPSS version 24.0.
6. For identification of the 'social awareness' and 'social presence' variables that predict social connectedness, an inferential statistical multiple regression analysis was conducted using SPSS version 24.0.
7. For the relationship between age and size of online social networks, a Pearson's correlation coefficient test was conducted, using SPSS version 24.0
8. For the relationship between SNS users and non-users, a hierarchal logistic regression analysis was conducted using SPSS version 24.0

9. Rural older adults' perceptions of SNS use was collected by focus group discussion data collection. The purpose of the focus group discussion was to describe social network site use among rural adults. For this study, the data was transcribed word-for-word, and combined with the transcriber's notes to develop an analysis of the results.

Chapter IV

Results

Purpose of the Study

The purpose of this study was to examine the characteristics and communication behaviors of rural older adult social network site users and non-users, the relationship between age and social network size, and the extent to which demographic and computer-mediated factors predicted SNS Use. For online SNS users, this study analyzed the influence of computer-mediated behaviors of social awareness and social presence to predict social connectedness. In addition, this study analyzed the relationship between social networking users and non-users and social connectedness, after controlling for the effects of age, gender, race, marital status, education, and income among rural older adults. Further, perception of online social networking site use by rural older adults was described.

Statistical analysis consisted of descriptive and inferential statistics of the demographic, social networking site use, and social connectedness data obtained from a questionnaire. Single and multiple response questions, and Likert-scale survey scores were grouped by the categorization of social networking site user and non-user. This analysis included examining the relationship among the categories with inferential statistical analysis. Focus group discussion data was obtained by identifying themes and responses for categorization. A description of the sample is presented followed by the study results.

Data Collection and Sample

The convenience sample for this study consisted of 350 rural community-dwelling adults, age 65 years and older, residing in eight rurally-designated counties (RUCC 7-9) in Southeast Idaho. The focus group was composed of six rural older adults, age 65 years and older, from one rural senior center in Southeast Idaho who were willing to participate. To ensure 350 responses to the questionnaire, the total sample size consisted of 372 participants. Twenty-two participants did not meet the rural residence and age inclusion criteria, or did not complete the questionnaire, and were excluded from the study, leaving 350 participants in the sample. This met the calculated minimum sample size set per *a priori* calculation with G*Power 3.0.10 for a medium effect size of .15, $\alpha = .05$, Power $(1-\beta) = .80$.

Three hundred and fifty participants completed the questionnaire. Informed consent for the questionnaire and focus group discussion were obtained. Participants were asked to complete six demographic questions, twenty-three single, multiple response, and Likert-type questions, and a 20 item Likert study instrument, the Social Connectedness Scale – Revised (Lee & Lee, 2001).

Missing Data

Prior to analysis, all variables were examined through descriptive and case summary reports for accuracy of data and missing values. For Part A of the questionnaire, demographics, *marital status* had two (0.6%) missing cases, *education* had four (1%) missing cases, and *income* had twenty-nine (8%) missing cases. Most of the respondents who did not report income stated they did not want to disclose this information. Part B of the questionnaire, the social networking survey, had no more than 23 (7%) missing cases,

and most of the questions had less than one percent missing cases. However, one of the single answer questions was treated as a multiple response choice by 19 (15%) of 126 respondents, and six (5%) had written comments of ‘don’t know/no opinion’, and there was one missing case. There were no differences in analyses run with and without these cases, therefore the 26 cases (21%) were treated as missing. Part C, the Social Connectedness Scale, had no more than 11 (3%) of missing cases for each question, and most were less than one percent missing. The Social Connectedness Scale – Revised (Lee & Lee, 2001) instrument was scored by adding 20 individual Likert scores. Forty-four (13%) of the 350 individual scores were counted as missing, and we can conclude that the missing values were not a source of bias.

Descriptive Statistics

Demographic Characteristics

In this study, demographic differences of age, gender, race, marital status, education, and income between SNS Users and Non-users were analyzed. A descriptive statistical summary of numbers, mean, sum totals and percentages was obtained, as well as bar graphs to visualize the data, using SPSS version 24.0. Table 1 depicts the entire sample population, categorized as either SNS Users ($N = 126$) or Non-users ($N = 224$).

There were 350 participants in the final analysis, with a mean age of 76.4 years (range = 65 – 101), and 196 (56%) were female. The sample was relatively homogenous regarding race, and 333 (95%) were Caucasian. Table 1 depicts the entire sample population, categorized as either SNS Users ($n = 126$) or Non-users ($n = 224$), or all participants ($N = 350$). Approximately one third (36%) of the participants were SNS Users. The mean age of SNS Users was 74 years, and that of Non-users was 77.8 years.

The majority ($N = 137$; 72%) of oldest-older adults (over the age of 75) years did not use SNSs. Seventy-five percent of the participants 'without a partner', and seventy-six percent of participants with a 'high school or below' education did not use SNSs. Non-users also accounted for the majority (71%) of participants with an income less than \$50,000.

Table 1

Demographic Characteristics of Social Network Site Users versus Non-Users

Variable	Non-Users Total (%)	SNS Users Total (%)	Total (%)
Age (Mean)	77.8	74	76.4
65-74	87 (24.9%)	72 (15.4%)	159 (45.4%)
75-101	137 (39.1%)	54 (24.9%)	191 (54.6%)
Gender			
Male	106 (30.3%)	48 (13.7%)	154 (44%)
Female	118 (33.7%)	78 (22.3%)	196 (56%)
Race			
American Indian	5 (1.4%)	2 (0.6%)	7 (2%)
Hawaiian/Pacific Islander	0	1 (0.3%)	1 (0.3%)
Asian/Asian American	3 (0.9%)	1 (0.3%)	4 (1.1%)
Black/African American	0	0	0
Hispanic/Latino	5 (1.4%)	0	5 (1.4%)
White/Caucasian	211 (60.3%)	122 (34.9%)	333 (95%)
Marital Status			
Married	104 (29.9%)	86 (24.7%)	190 (54.6%)
Divorced	21 (6%)	9 (2.6%)	30 (8.6%)
Widowed	89 (25.6%)	29 (8.3%)	118 (33.9%)
Separated	1 (0.3%)	0	1 (0.3%)
Never been married	7 (2%)	1 (0.3%)	8 (2.3%)
Partner	1 (0.3%)	0	1 (0.3%)
Education Completed			
Grade 1-8	10 (2.9%)	0	10 (2.9%)
Grade 9-11	20 (5.8%)	4 (2.1%)	24 (6.9%)
Grade 12/GED	73 (21.1%)	28 (8.1%)	101 (29.2%)
College 1-3 years	67 (19.4%)	51 (14.7%)	118 (34.1%)
College 4 years	24 (6.9%)	22 (6.4%)	46 (13.3%)
Graduate school	27 (7.8%)	20 (5.8%)	47 (13.6%)
Income			
Less than \$30,000	100 (31.2%)	39 (12.1%)	139 (43.3%)
\$30,000 to \$49,999	66 (20.6%)	30 (9.3%)	96 (29.9%)
\$50,000 to \$69,999	19 (5.9%)	31 (9.7%)	50 (15.6%)
\$70,000 to \$74,999	11 (3.4%)	6 (1.9%)	17 (5.3%)
\$75,000 to \$99,999	3 (0.9%)	5 (1.6%)	8 (2.5%)
\$100,000 or more	6 (1.9%)	5 (1.6%)	11 (3.4%)

Relationship Between Demographic Characteristics and Social Networking Site Use

A Pearson's Chi-Square test of association was conducted for each of the demographic categories against the outcome of either being a SNS User or Non-user, shown in Table 2. Results indicated a statistically significant association between *age* (small negative association), *marital status* (small positive association), *education* (small positive association), and *income* (small positive association), and SNS use. Figures 2, 3, 4 and 5 bar graphs illustrate the demographic differences between SNS Users and Non-users for the four variables that were significant.

Table 2

Pearson's Chi-Square test of association between demographics and SNS Users and Non-users.

Variable	$\chi^2 (1, N = 350)$	ϕ
Age	10.90*	-0.18
Gender	2.79	0.09
Race	1.21	0.06
Marital Status	15.25**	0.21
Education	14.81**	0.21
Income	17.45**	0.23

Note. * $p < .05$, ** $p < .001$

Younger-old adults, and adults with spouse or partner, college education, and higher income (greater than \$50,000), were more likely to use SNSs. The results revealed no statistically significant difference in *gender* and *race* between SNS Users and Non-users. Most of the participants were Caucasian (95%), and the number of males and females in both categories was relatively equal. Although slightly more females than males used SNSs, it was not significantly different.

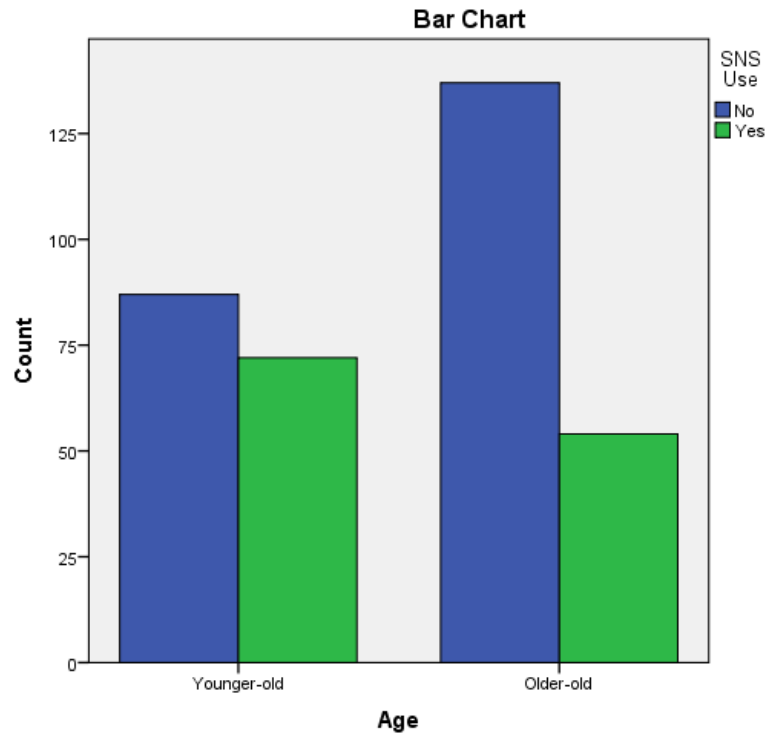


Figure 2. Age difference between SNS Users and Non-users.

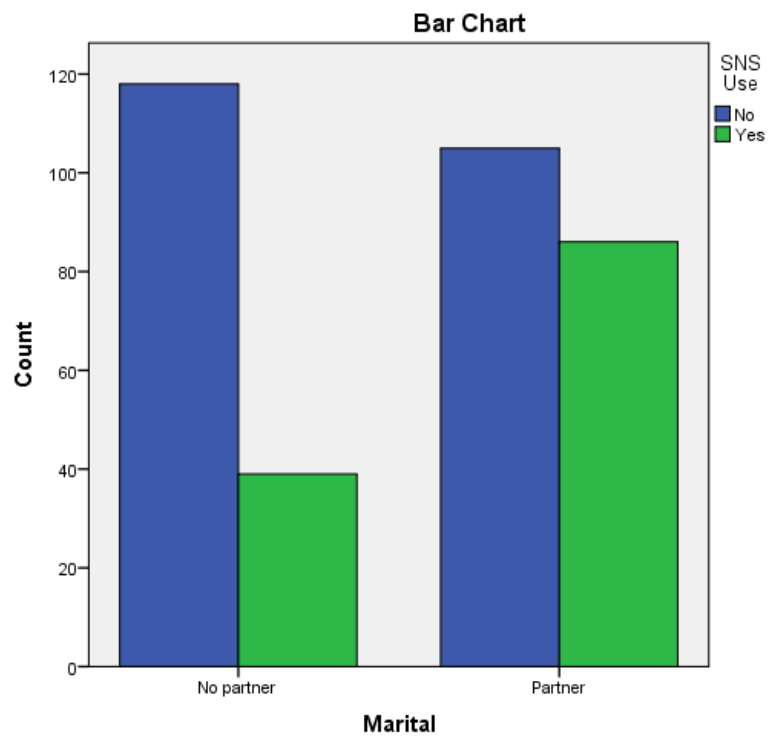


Figure 3. Marital Status difference between SNS Users and Non-users.

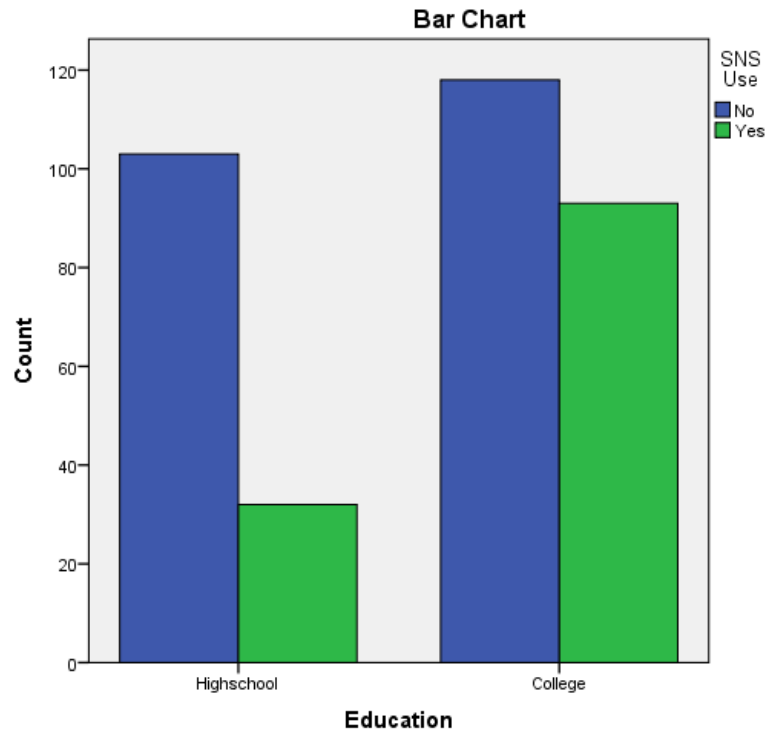


Figure 4. Education difference between SNS Users and Non-users.

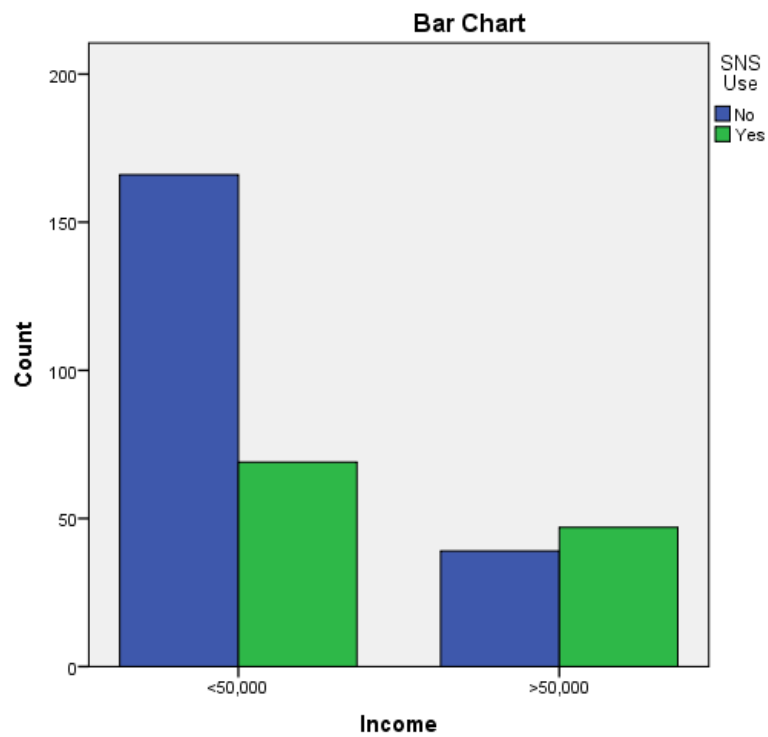


Figure 5. Income difference between SNS Users and Non-users.

Computer-Mediated Differences between SNS Users and Non-Users

For differences in SNS Users and Non-users access and ability to use technology, a descriptive summary of numbers, mean, sum totals and percentages was obtained, with bar graphs to visualize the data. An inferential statistical Pearson's Chi-Square test of association (Table 3) was conducted for each of the variables: *access to a computer*, *internet at home*, *comfortable using the internet*, *perceived importance of SNSs*, and *privacy concerns*, using SPSS version 24.0. Figures 6, 7, 8 and 9 illustrate the differences between SNS Users and Non-users for the five variables that were significant.

Table 3

Pearson's Chi-Square test of association between computer-mediated characteristics and SNS Users versus Non-users.

Variables	χ^2 (1, N = 350)	ϕ
Computer Access	64.10*	0.43
Home Internet	62.99*	0.42
Comfortable Internet	104.14*	0.55
Importance	60.93*	0.42
Privacy	9.01*	0.17

* $p < .01$, ** $p < .001$

Overall, approximately one third (36%) of the 350 rural older adults used SNSs, and 64% were Non-users. Many of the adults in the sample had access to a computer (72%) and internet at home (73%), and viewed SNSs as important (74%).

Approximately half (53%) indicated they were comfortable with using the Internet, and slightly less than half (40%) viewed SNS privacy policies as effective. The majority of those without computer access (97%), and without internet at home (98%) were Non-users. Among SNS Users, 98% had access to a computer, and 98% had home internet.

Eighty-eight percent of SNS Users were comfortable using the internet, compared to 32% of Non-users. Similarly, 97% of SNS Users viewed SNSs as important, compared to 60% of Non-users. Half (50%) of the SNS Users and one third of the Non-users viewed SNS privacy policies as effective.

The results of the Chi-Square test of association revealed that all five of the computer-mediated factors were significantly associated with, and not independent of SNS use. Rural older adults who had *computer access*, *home internet*, *were comfortable using the internet*, and *viewed online SNS as important*, and *privacy policies as effective*, were more likely to use SNSs. Most of the variables had a medium positive association, and *viewed privacy policies as effective* had a small association.

Predictors of Social Networking Site Use

An inferential binary logistic regression analysis was conducted using SPSS version 24.0 to predict SNS use shown in Table 4). Of the 350-participating rural older adults in the sample, 126 (36%) were SNS Users, and 224 (64%) were Non-Users. The focus group was the rural older adults who were SNS Users. Demographic and computer-mediated variables that had been shown to be significantly associated with SNS use were used as predictors and included: *age*, *marital status*, *education*, *income*, *computer access*, *home internet*, *comfortable using the internet*, and *perception of the importance of SNSs* and *privacy policy effectiveness*. The binary logistic regression was statistically significant, $-2 \text{ Log Likelihood} = 239.59$, $\chi^2(9, N = 292) = 151.06$, $p < .001$. The Nagelkerke pseudo $R^2 = .74$, indicating the model accounted for 74% of the total variance in SNS Use. The

correct prediction rate was 86.8% for rural older adults who were classified as SNS Users, and 76.4% who were classified as Non-users.

Table 4

Logistic regression predicting SNS use based on demographic and computer-mediated predictor variables.

Variable	<i>B</i>	<i>SE-B</i>	Wald	Exp(<i>B</i>)
Age	-0.46	0.34	1.83	0.64
Marital Status	-.048	0.39	1.55	0.62
Education	0.17	0.37	0.21	1.19
Income	-0.31	0.37	0.74	0.73
Computer Access	0.73	0.99	0.54	2.07
Home Internet	2.32	0.91	6.44*	10.15
Comfortable Internet	2.12	0.43	24.50**	8.3
Importance SNS	3.19	0.78	16.51**	24.19
Privacy Policies	0.23	0.33	0.49	1.26
Constant	-5.90	1.47	16.12**	0.00

Note. *df* = 1, **p* < .05, ***p* < .001

Table 4 presents the binary logistic regression coefficients, the Wald tests, and the odds ratios of each predictor. The Wald tests showed *Home Internet*, *Comfortable using the Internet*, and *Importance of SNSs* predictors were statistically significant (*p* < .05) indicators of SNS Use. *Age*, *marital status*, *education*, and *income*, *computer access*, and *privacy policy effectiveness* did not contribute to the model, and were not significant predictors. Rural older adults who were SNS Users were only 10% as likely to use SNSs as rural older adults who were Non-users. Ex(*B*) values indicated that when *Home*

Internet is raised by one unit, the odds ratio is six times as large, and therefore rural older adults with internet at home are six more times likely to use SNSs. Individuals who are comfortable with the internet are 25 times more likely to use SNSs, and individuals who view SNS as important are 17 times more likely to use SNSs.

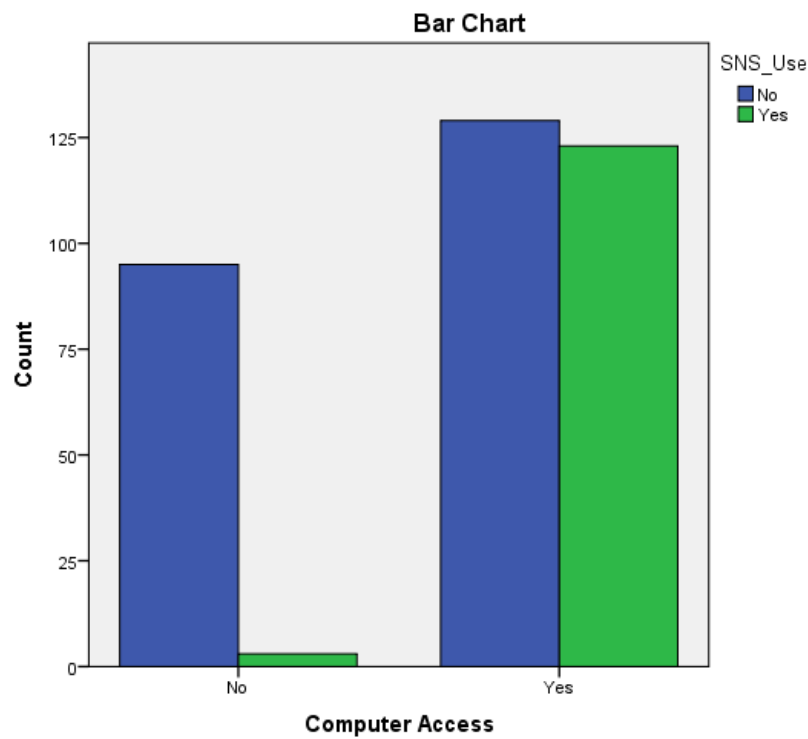


Figure 6. Home computer access, difference between SNS Users and Non-users.

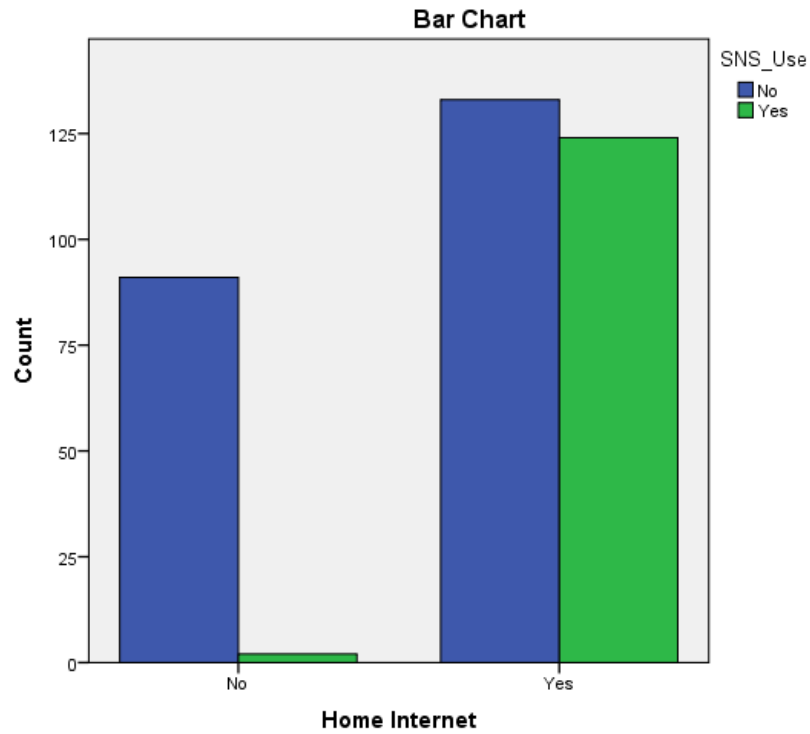


Figure 7. Internet at Home, difference between SNS Users and Non-users.

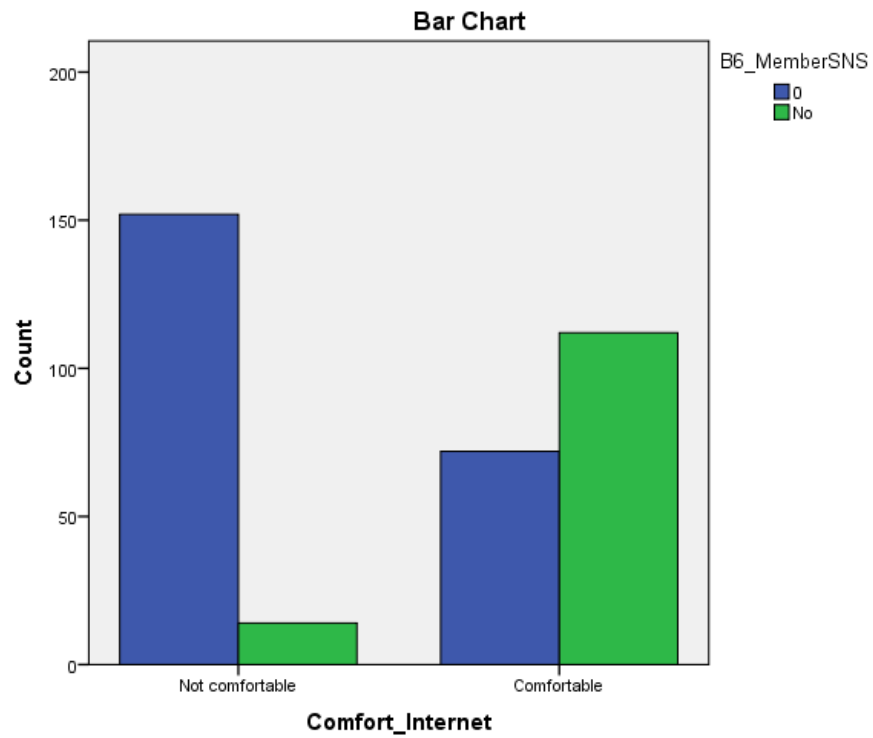


Figure 8. Comfortable with Internet, difference between SNS Users and Non-users.

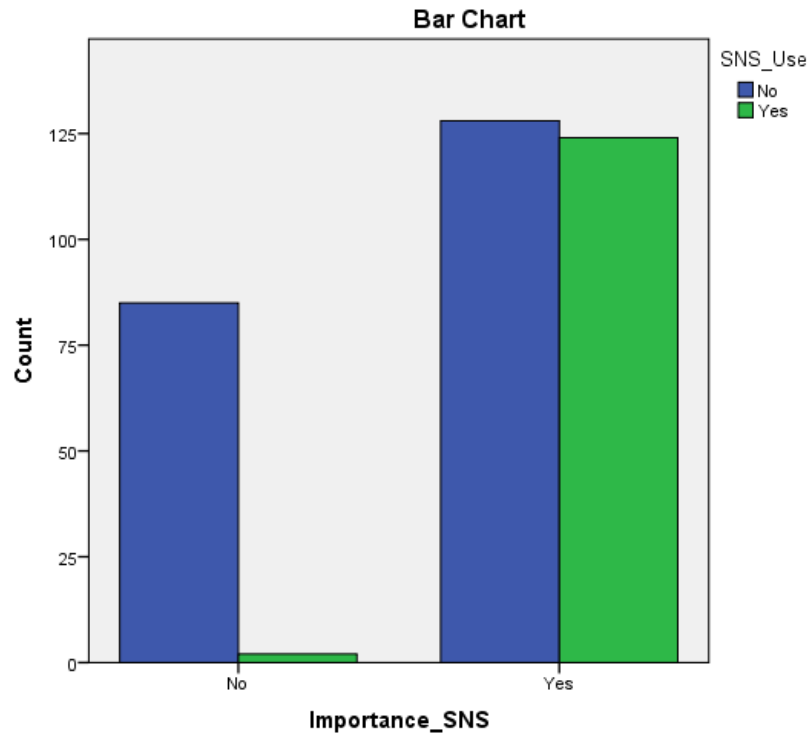


Figure 9. Importance of SNSs, differences between SNS Users and Non-users.

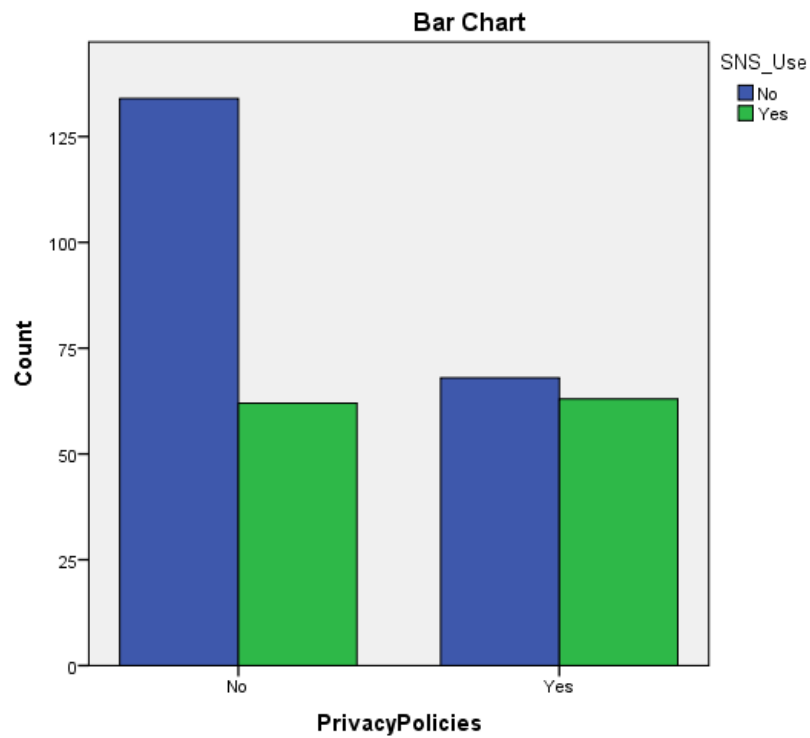


Figure 10. Privacy policy effectiveness, difference between SNS users and non-users.

Reasons Not to Use Social Networking Sites

For reasons' rural older adults choose not to use SNS, a descriptive statistical summary of numbers and percentages was obtained using SPSS version 24.0. A bar graph shown in Figure 10 was used to visualize the data. Among the 224 SNS Non-users, almost half (46%) indicated that the reason they chose not to use SNSs was due to lack of interest, and 6 (2%) reported they did not enjoy it. Others cited lack of knowledge about SNSs (17%), lack of computer access (14%), and a belief that SNSs were too complicated (5%). Three (1%) reported it was against their culture. The remaining responses demonstrated concerns about privacy (8%). Respondents could choose more than one answer in the survey question, and write in other reasons. Other reasons listed included: lack of computer efficacy, security concerns, preference for other types of social networking, time consumption, and lack of value (see Figure 11 below).

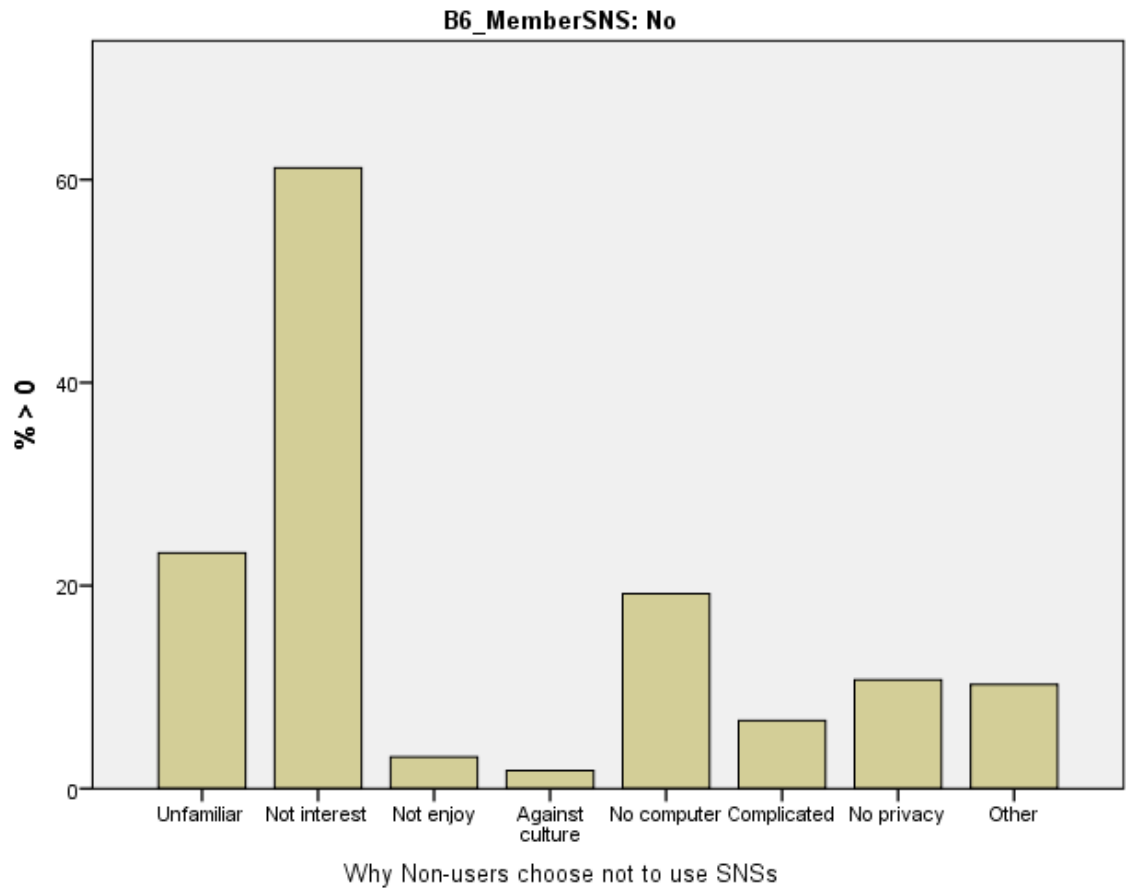


Figure 11. *Reasons why Non-users do not use Social Networking Sites.*

Characteristics of Social Network Site Usage

Mode of access. SNS Users in the sample were asked how they access SNSs. Participants could choose more than one answer. The most popular way to access SNSs was on their home computer or laptop (55%), followed by smartphone (24%), and/or a tablet device (18%). Few used a shared computer (2%), or work computer (1%) to access SNSs.

Social networking sites accessed. Participants were asked what types of SNSs they used, and could choose more than one answer. By order of preference, almost half (44%) of the SNS Users reported using Facebook, followed by YouTube (14%) and

Pinterest (14%). Eight percent used WindowsLive, 7% used blogs and forums, and 6% used Classmates.com. Additionally, 6% used LinkedIn, 3% used Windows Live, 2% used Twitter, and 2% accessed dating websites. For responses to 'other', 15% listed Instagram, church websites, and genealogy websites.

Reasons for using social networking sites. Participants mainly used SNSs to stay in touch with family and friends (34%), and to find information (24%). Sharing videos, pictures, and music (15%), sharing experiences (8%), and playing games (7%) were also reasons to use SNSs. Keeping in touch with professional and business contacts (4%), and to get opinions (5%), and to keep in touch with social groups (1%) were also reasons to use SNSs.

Types of information shared on personal profiles. Participants were asked what kinds of personal information they share on their SNS profiles, as a multiple response question. SNS Users indicated they share some personal profile information. Half of the 126 respondents share email (51%), real name (60%), profile picture (52%), gender (47%), birthday (50%), and pictures (52%) on SNS profiles. Approximately one quarter of SNS Users share 'work and/or family information' (25%), name of town (28%), hobbies (23%), and 'interests' (28%). Slightly more respondents shared religious views (21%) than political views (20%). Videos (12%), and favorite quotations (19%) were also shared. Only one respondent reported sharing cell phone number (0.8%).

Types of information posted. The most common content posted were 'family events' (60%), followed by 'random information and interesting things' (49%), and 'travel places' (35%). Political issues (14%), were shared more often than game scores (5%) and sports events (3%).

Private versus public communication preferences. Participant responses to the question of preference for posting on friend's pages, sending private messages, or using Instant chat modes, were mixed. Although it was a one choice answer, 38 (30%) of the 126 SNS Users chose more than one answer or wrote in the fourth option 'other' that they do not post. A comparison of analysis conducted as a multiple response question, and then treated as missing cases showed similar results, and therefore the cases were treated as missing. The majority of the 87 SNS Users preferred public messaging (71%) rather than private communication (29%). Posting comments to friend's pages ($n = 62$; 72%) was preferred to sending private messages ($n = 23$; 26%), and using Instant chat modes ($n = 2$; 2%).

Social Awareness and Social Presence Predictors of Social Connectedness

An inferential multiple regression analysis was conducted using SPSS version 24.0 to predict social connectedness, based on social awareness and social presence. Refer to Table 5 for results. The mean social connectedness score of the rural older adult SNS Users participating in the study was $M = 92.97$ ($SD = 15.62$). Of the 129 participating rural older adult SNS Users in the sample, 118 (94%) completed the Social Connectedness survey, and there were 8 (6%) missing cases. Variables that represented measures of social awareness and social presence were used as predictors for this analysis. 'Social awareness' was measured by rural older adults' preference for private or public communication. 'Social presence' was measured by: a) number of months as a SNS user, b) frequency of SNS use (hours per day), c) number of group memberships, and d) online social network size, to predict social connectedness

Table 5

Summary of multiple regression data predicting social connectedness based on social awareness and social presence variables.

Model	<i>B</i>	<i>t</i>	<i>sr</i> ²	<i>R</i>	95% CI(<i>B</i>)
Constant	91.632	23.15*	-0.046	.09	[83.74, 99.52]
Communication Preference	0.87	0.20*			[-7.63, 9.36]
Group Size	-1.423	-0.25*			[-12.88, 9.94]
SNS Length	-.175	-0.04*			[-8.15, 7.80]
SNS Size	2.742	0.70*			[-5.09, 10.57]

Note. * $p > .05$

Table 5 presents the linear regression coefficients, ANOVA, and model fit of the predictors. The regression model was not statistically significant, $F(4, 74) = 0.17, p = .968$. The $R^2 = .01$, indicating one percent of the total variance in social connectedness can be explained by social awareness and social presence on SNSs. The regression model did not significantly predict social connectedness. Communication preference, size of group memberships, length of time as a member, and social network size, were not significant predictors of social connectedness. However, results indicate a relationship between communication preference, group size, length of time as a SNS User, and SNS use.

Age and Online Social Network Size

A Pearson's product-moment correlation coefficient test was conducted using SPSS version 24.0 to examine the relationship between rural older adult SNS Users' size of online social networks and age (age 65 – 74 = 0 = younger-old, age 75 and over = 1 =

older-old). Online social network size was classified as low number of contacts/friends (0 = 0 – 49) or high number of contacts/friends (1 = > 50). The mean age of the rural older adult SNS Users in the study was $M = 74.01$ ($SD = 6.16$). Of the 126 participating SNS Users, 72 (57%) of the SNS Users were categorized as younger-old, and 54 (43%) were categorized as older-old. Seventy-eight (62%) of the 124 SNS Users had a social network size less than 50 contacts and friends, and 46 (37%) had 50 or more contacts and friends in their online social networks

The Pearson correlation coefficient test result indicated the relationship was statistically significant ($p < .05$). Rural older adult SNS Users' age and social network size were weakly negatively correlated, $r(124) = -.19$, $p = .034$. Online social networking size and age were dichotomous variables and non-parametric, therefore, a Spearman's correlation coefficient was performed. Results were the same, and showed a statistically significant ($p < 0.5$) association. There was a weak negative association between age and social network size, $r(124) = -.19$, $p = .034$. The coefficient of determination $R^2 = .036$, indicating 3.6% shared variance. Lower levels of age are associated with higher levels of social networking size. Younger-older rural adult SNS Users tend to have larger online social networks. Age explained 3.6% of the shared variance of the social network size.

Social Connectedness Predictors of SNS Use

A hierarchal binary logistic regression was used to predict SNS Use (0 = Non-user, 1 = SNS User), based on respondents' Social Connectedness Scores. Control variables were age, gender, race, education, income, and marital status. The mean Social Connectedness score of the rural older adults participating in the study was $M = 90.28$ ($SD = 16.10$). The mean score of SNS Users in the study was $M = 92.97$ ($SD = 15.62$),

and Non-users was 88.59 ($SD = 16.20$). Of the 350 participating rural older adults in the study, 126 were SNS Users, and 224 (64%) were Non-users, and 306 (87.4%) completed the Social Connectedness Survey. There were 44 missing cases (12.6%). The focus group was the rural older adults who were SNS Users.

The hierarchical binary logistic regression was statistically significant, $-2 \text{ Log Likelihood} = 335.52$, $\chi^2(7, N = 306) = 35.01$, $p < .001$. The Nagelkerke pseudo $R^2 = .16$, indicating the model accounted for 16% of the total variance in SNS Use. The outcome predictions for the participants in this study were good with 65.8% of the cases in the study categorized correctly based on a classification criterion for success of .50 or higher for predicted probabilities. The correct prediction rate was 39.3% for rural older adults who were classified as SNS Users, and 82.5% who were classified as Non-users. Refer to Table 6 for results.

Table 6

Hierarchical logistic regression predicting SNS use based on social connectedness scores.

Variables	<i>B</i>	<i>SE-B</i>	Wald	Exp(<i>B</i>)	95% CI Exp(<i>B</i>)
Age	-0.38	0.27	1.91	0.68	[0.40, 1.17]
Gender	0.68	0.28	5.72*	1.97	[1.13, 3.44]
Race	0.05	0.67	0.01	1.05	[0.28, 3.94]
Marital Status	0.59	0.30	4.00*	1.81	[1.01, 3.24]
Education	0.75	0.31	6.05*	2.12	[1.17, 3.85]
Income	0.64	0.32	4.11*	1.90	[1.02, 3.54]
Social Connectedness	0.00	0.01	0.09	1.00	[0.99, 1.02]
Constant	-1.97	1.00	3.86	0.14	

Note: CI = Confidence Interval.

* $p < .05$

Table 6 presents the hierarchical binary logistic regression coefficients, the Wald tests, the odds ratio, and 95% confidence interval for the odds ratio for each predictor. The Chi-Square test at block 1 is statistically significant, but the Chi-Square test for block 2 is not statistically significant even though the model remained statistically significant due to the other predictor variables. Social Connectedness did not add to the model when controlling for the demographic variables already in the model.

The Wald tests showed gender, marital status, education, and income were statistically significant ($p < .05$) indicators of SNS Use. Rural older adults who were female were only 2.0 times as likely to use SNSs as males. Participants who were married or had a partner were 1.8 times as likely to use SNSs as rural older adults without partners when controlling for the other factors. Similarly, participants who had a college

education were 2.1 times as likely to use SNSs as rural older adults with a high school or lower education when controlling for the other factors. Additionally, participants who had a higher income (> \$50,000) were only 1.9 times as likely to use SNSs as rural older adults with an income less than \$50,000 when controlling for the other factors in the model.

Additionally, SNS Users were asked “How does online SNS affect your social life?” The majority (74%) felt that SNS use does not affect their face-to-face communication, 24% felt it had “somewhat” of an effect, and 2% felt it replaces most face to face communication.

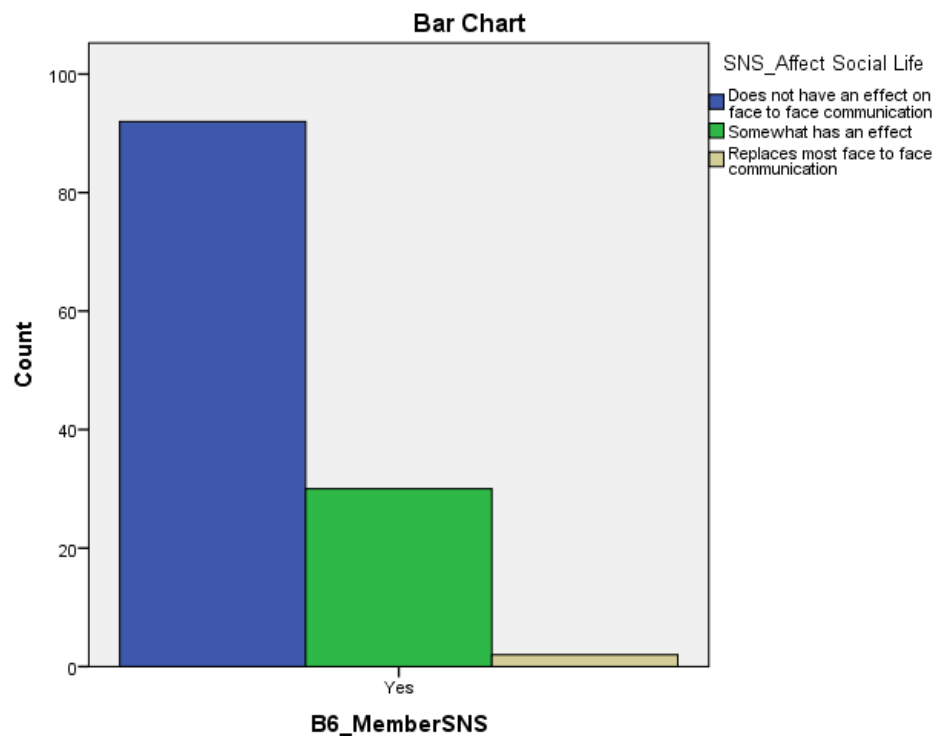


Figure 12. SNS use and effect on social life among Social Network Site Users.

Perceptions of SNS Use and Social Connectedness

Rural older adults' perceptions of SNS use was examined by focus group discussion data obtained from six rural older adults at one senior center. Open-ended questions were asked to further understanding of the quantitative data about SNS use and social connectedness. The responses were analyzed through a process of categorizing groups of like and similar answers into themes, and were further grouped into subcategories. Four categories representing the factors influencing SNS use and social connectedness were identified: a) SNS user characteristics b) communication preferences on SNSs c) social connectedness, and d) Non-user characteristics. From these four categories, several subcategories emerged for each of the main categories. SNS user characteristics was further categorized into four subcategories: a) preferred SNSs, b) motivations to use SNS, c) frequency of use, and d) profile information shared. Communication preferences was further classified into three subcategories a) private versus public preferences, b) traditional versus SNS communication, and c) reasons for preferences. Social connectedness was further classified into three subcategories: a) perceptions, b) maintaining, and c) changing patterns. Non-user characteristics had one central subcategory, reasons not to use SNSs.

SNS user characteristics. Participants in the discussion group that used SNSs indicated that although they used a computer to access SNSs, but preferred using their phone, primarily for Facebook and Pinterest. SNS users usually shared their real name and age, although one participant placed made up information on his profile, citing security concerns. There was general agreement among SNS users in the group that they used Facebook, their preferred SNS, infrequently. As one rural older adult explained “I

use Facebook, but not a lot.” Many in the group confirmed these sentiments, and felt that group messaging was more convenient because “...you only have to say something once,” and text messaging was “private...so it isn’t everybody in the world reading your messages.” Another participant posted to young family members, explaining “...sometimes I’ll comment on my grandkids stuff, but that’s about it.”

Participants’ responses indicated that convenience, privacy, and a lack of value, interest, and computer efficacy may influence the low frequency of SNS use. The majority of participants viewed social networking sites to stay in contact with friends and family, but not to acquire new social connections. Members of the group noted that although SNSs may not be important to them, maintaining contact with younger relatives was a motivation to use SNSs: “...most of friends are on email, I use SNSs for younger ones, nieces and nephews, family.” Another participant observed “almost all of my contemporaries are gone, the younger ones are on there.” SNS users indicated they preferred other methods of communication, and posted very little or nothing on Facebook. Communication preferences and smaller friendship networks due to life changes also played a part in lower frequencies of SNS use.

Communication preferences on SNSs. A number of SNS users in the group preferred to “read what other people are doing and [not] put anything on.” Participants preferred texting or calling rather than public posting or private messaging on SNSs, to “hear their voice [rather] than see the writing.” Passive observation, rather than initiating posts was emphasized by SNS in the group “just to keep track of what other people are doing.” Some in the group preferred traditional methods of communication because they

were accustomed to it: “We’re all used to talking to people on the phone, and change, it’s hard. I think social media is a great thing and it’s a terrible thing, it’s both.”

Social connectedness. Overall, participants felt socially connected, partially due to the length of time of residence in the community. One participant’s comment characterized the feeling of belonging to the community: “...because I’ve got family here and I’ve lived here all my life so I know so many people. Four nieces here in town that are very close to me that I do a lot with.” Another participant felt “more socially connected [driving]...because of the independence.” For others, the senior center helped maintain social connections: “...we usually all sit at the same table. I come about three times a week, depending on what I have going on.” Other activities in the community also helped maintain social connectedness:

I have my church, and a book club I belong to, and a group of us that get together to play cards. In the summer I belong to the local chapter of Good Samaritan, and I go on a trip with them once a month in my motor home. So I have a lot of activities and stuff going on.

Overall, group participants preferred face-to-face interaction to maintain social connectedness:

You gotta go out, get around the country and talk to people all the time. I go down the street and I’ll have my nieces say why you talking to random people, and I’ll turn around and say you don’t gotta talk to ‘em if you don’t want to, and she’ll get mad at me every time.

However, rural older adults believed SNS use was important to maintain contact with younger generations accustomed to SNSs to be socially connected: “If you want to stay in touch with them nowadays you have to use texting, Facebook, something.”

Most participants believed their level of social connectedness was the same in the older adult years, but changed by life factors. Some became closer to family networks, others became closer to friend networks to maintain social connectedness. One participant was close to friends “because my friends are my neighbors. They all live a short walk.” However, illness impacted the social connectedness of another group member, who stated he was “... not as [close] as we [family] used to be. I have been in and out of the hospital for the last few years and it makes it hard.” Another participant felt SNSs did not maintain social connectedness, and did not “...feel support from that.”

Non-user characteristics. Overall, non-users were “not interested” in using SNSs, and some reported they “...couldn’t understand very much of it,” or “didn’t like it.” Others had spouses that used SNSs to keep them informed of family and friends. A few cited the lack of a computer or computer efficacy to access SNSs, and physical impairments such as “difficulty reading” and “difficulty typing on the computer” as reasons not to use SNSs. Safety and security concerns of “people stalking other people,” and concerns about the content being “...stuff that’s just gossip or not real” were also reasons for non-use. The most commonly expressed reason was a preference for face-to-face or phone interaction. Some group participants were concerned that SNS use meant “...less face to face communication” and would replace other forms of social interaction.

Results of the qualitative analysis from the focus group discussion data were consistent with the quantitative findings of the sample. This analysis provided further understanding of the use of SNSs and social connectedness among rural older adults.

Validity and Reliability

This was a small-scale study to explore the SNS use of rural older adults. Use of a convenience sample may have posed a threat to internal validity, because differences in outcomes between the groups may be due to group differences rather than the effect of the independent variables (Polit & Beck, 2011). The research design was not an experimental design, therefore competing explanations for outcomes cannot be ruled out, raising the threat to internal validity (Polit & Beck, 2011). With the descriptive analysis portion of the study, causality cannot be inferred (Polit & Beck, 2011). The sample was not representative of the population and generalizations cannot be made, causing a threat to the external validity of the study (Polit & Beck, 2011). The participants were recruited from senior centers, libraries, grocery stores, community events and health fairs. Response to flyers to home-bound individuals led to only one participant. Rural older adults in the study were active and involved in the community, which may have led to the high social connectedness scores found in the study for both SNS Users and Non-users.

The social connectedness scale is population specific, and may be subject to culture-bound assumptions and may have caused differences when applied to this older adult population (Sobczak, 2007). Many of the respondents asked for clarification for sentences such as “*Even among my friends, there is no sense of brother/sisterhood*” and “*I catch myself losing a sense of connectedness with society*” and the difficulty

understanding these sentences were reflected in higher missing cases (3% and 2% respectively).

The social networking site survey was found online and adapted by the researcher to include some questions from an older adult social media questionnaire, and therefore may pose a threat to reliability and validity when used in this rural geographic region for an older population (Sobczak, 2007; Pierce & Scherra, 2012).

Additionally, the sample was mainly Caucasian, with a deficiency of participants representing other ethnicities. This may have limited the detection of differences between SNS Users and Non-users.

Participant responses to the question of preference for posting on friend's pages, sending private messages, or using Instant chat modes, were mixed. Although it was a one choice answer, 38 (30%) of the 126 SNS Users chose more than one answer or wrote in the fourth option 'other' that they do not post. A comparison of analysis conducted as a multiple response question, and then treated as missing cases showed similar results, and therefore the cases were treated as missing.

Summary of Results

Analysis of the data revealed younger-old adults, and adults with spouse or partner, college education, and higher income were significantly more likely to be SNS Users. More females than males used social networking sites, but the difference was not statistically significant. Rural older adults who had computer access, home internet, were comfortable using the internet, and viewed social networking sites as important, and privacy policies as effective, were more likely to be SNS Users. Oldest-older SNS Users had smaller networks sizes than younger-old SNS Users. Rural older adults who had

home Internet, felt comfortable using the Internet, and viewed SNSs as important were more likely to use SNSs. Barriers to using social networking sites included: lack of access and ability, lack of interest, time consumption, lack of value, and security and privacy concerns. When controlling for demographic variables, social connectedness was not an indicator of social networking use. The focus group discussion data indicated a low frequency of social networking site use, mainly to stay in contact with younger family members who are online. SNS Users preferred to observe rather than post online, and voiced a preference for traditional forms of communication to maintain social connectedness.

Chapter V

Discussion

The purpose of this study was to examine the characteristics and communication behaviors of rural older adult social network site users and non-users, the relationship between age and network size, and the relationship between social networking users and non-users and social connectedness, after controlling for the effects of age, gender, race, marital status, education, and income among rural older adults, and to describe their perceptions of social networking site use.

This discussion begins with a review of the sample and generalizability of the study. Next, an interpretation of the major findings and their relevance to the theoretical framework and previous studies is discussed. Additionally, implications for nursing education, and limitations, will also be discussed. Finally, recommendations for further research are discussed.

Sample and Generalizability

A total of 350 ($N = 350$) rural older adults from eight rural Southeast Idaho Counties (Rural – Urban Classification Code 7– 9) were contacted to participate in the study. For the focus group discussion, six rural older adults at one senior center agreed to participate ($N = 6$). Some in the focus group discussion had not participated in the quantitative portion of the study. The convenience sample for this study included community-dwelling rural older adults aged 65 to 101 years of age ($M = 76.4$). The sample size of 350 rural older adults was large enough to be generalizable to another sample chosen from the same population.

All the rural older adults received the paper and pen questionnaire the same way. Ninety-five percent of the participants were recruited at senior centers, health fairs, supermarkets, libraries, and local events. The other five percent were contacted by a ‘snowballing’ method, and were referred by friends in the study. Responses to 400 flyers sent with the ‘Meals on Wheels’ program for home-bound individuals yielded one response. Senior centers were not allowed to give contact information for the home-bound individuals. This explained why most participants were not home-bound rural older adults.

Discussion of Findings Related to Theoretical Framework

The literature suggests that SNS use would result in higher degrees of social connectedness for SNS Users. As SNS Users and Non-users had high degrees of social connectedness in this study, it was unsurprising that highly social connected rural older adults were not more likely to be SNS Users.

Research question 1. Analysis of the demographics confirmed there was a statistically significant difference between the age, marital status, education, and income of SNS Users and Non-Users, in answer to research question one. Younger-older adults, and adults with spouse or partner, college education, and/or higher income (greater than \$50,000) were more likely to use SNSs. Older adult SNSs use has increased in the last few years, especially in younger older adults (Zickuhr & Madden, 2012). The average age of SNS Users in the study was 74 years, whereas the average age of Non-users was 78 years. Consistent with previous research and the Pew Research Center statistics, this study confirmed the trend that younger-older adults are more likely to use SNSs (Bell et al. 2013; Hope et al., 2014; Hutto & Bell, 2014; Hutto et al., 2015; Vroman et al., 2015;

Zickuhr & Madden, 2012). Although some studies included younger individuals age 50 and over, the results were the same when age was limited to rural older adults age 65 years and older in this study. Surprisingly, more than half (54%) of the younger-older adults (age 65-74) in this study were Non-users. Although the Pew Research Center reported that rural residents' SNS use lags behind urban and suburban residents, the percentage of rural older adults who use SNS in the study (36%) is similar to U.S. statistics of older adult SNS use of 35% (Duggan, Ellison, Lampe, Lenhart, & Madden, 2015; Perrin, 2015). As the sample was homogeneous, and 95% were Caucasian, it is unsurprising that differences in race were not detected. However, the Pew Research Center reported similar SNS use among race and ethnicities, which suggests results may have been the same if the sample had been more diverse (Perrin, 2015). Gender was not significantly different between Users and Non-users, although more females (56%) than males (44%) used SNSs, possibly due to the narrowing of the gap between female and male SNS use (Perrin, 2015).

This study also indicated rural older adults with a spouse or partner, college education, and higher income were more likely to be SNS Users, and was consistent with U.S. statistics of SNS users (Perrin, 2015). The results are consistent with prior work by Vroman et al. (2015) who found that younger-older adults with a higher education and living with a spouse or partner increased the likelihood of using FB. In contrast, the majority of studies did not find differences in marital status, income, and education, which may have been due to a lack of variation within the samples, and the context of the urban setting. Researchers used FB rather than overall SNS use, which further limits

comparisons. Overall, social presence on SNSs was mediated by the demographic characteristics of the rural older adult.

Research question 2. Analysis of computer-mediated variables confirmed rural older adults who had computer access, home internet, were comfortable using the internet, and viewed online SNS as important and privacy policies as effective, were more likely to use SNSs. In this study, more SNS Users had home computers and access to the internet, and felt more comfortable using the Internet compared to Non-users, demonstrating access and ability are important mediators of SNS use. These findings illustrate having a computer and Internet at home is associated with being comfortable with the Internet. These results are consistent with prior studies that demonstrated older adults who felt more confident using new technology were more likely to be FB users than those who felt less confident (Bell et al., 2013; Hutto et al., 2015). Perceptions that SNSs are important increased the likelihood of SNS use. This finding supports those from Braun (2013), who found that greater perceived usefulness of SNSs predicted intention to use SNSs, and previous studies that indicated older adults who perceived a higher degree of positive impact from ICTs were more likely to be FB Users (Bell et al., 2013; Hutto et al., 2015). Rural older adult perceptions that SNS privacy policies are effective increases the likelihood of SNS use in this study, and are similar to Braun's (2012) study results that indicated trust in SNSs was associated with greater intention to use SNSs. This suggests trust in privacy policies are an important factor in positive perceptions of SNSs, and pose a significant barrier to using SNSs for those who have a negative view of privacy effectiveness (Xie et al., 2012).

Research question 3. Analysis of predictors of SNS use confirmed having Internet at home, feeling comfortable using the Internet, and viewing SNSs as important, significantly increased the likelihood of using SNSs. Rural older adults who were comfortable with the internet were 25 times more likely to use SNSs as Non-users in this study. Zickuhr and Madden (2012) have attributed the decline of Internet and social media use after age 75 to a lack of confidence using technology, and a lack of ‘perceived relevancy’ of SNSs for oldest-older adults. These results demonstrate the ability to have a social presence on SNSs is mediated by access and the ability to use SNSs, and the perceptions of the value and safety of doing so.

Research question 4. The main reason Non-users chose not to use SNSs was lack of interest (46%). Participants also reported lack of knowledge, computer access, and self-efficacy were barriers to accessing SNSs, as well as privacy and security concerns. Others reported that using SNS lacked value, was time consuming, and/or preferred other types of social networking. These findings are consistent with Hutto & Bell’s (2014) study, and the Pew *Internet Project* report that American older adults’ main reason for not using the internet was due to lack of interest (Zickuhr, & Madden, 2012). These results are not surprising as analysis in this study have demonstrated that feeling comfortable with Internet, having a home computer, and viewing SNSs as important, were significant predictors of SNS use. Several studies reported age-related issues such as low vision (Bell et. al, 2013; Hutto et al., 2015), and differing cultural norms (Leist, 2013) were also barriers to using SNSs. Focus group members in this study expressed similar views, and lack of value and a preference for traditional methods of

communication were reasons for low frequency or non-use. The qualitative data supported the quantitative findings of the study.

Research question 5. Examination of SNS usage revealed rural older adults typically accessed FB, the most popular SNS, by home computer or laptop, followed by smartphone and tablet devices. Few used a shared or work computer. Interestingly, few of the senior centers had computers for members use. This finding is consistent with previous studies of older adults (Hutto & Bell, 2014; Hutto et al., 2015). The Pew Research Center reported American older adults differ from the general population in the devices they use (Smith, 2014). Although half the population uses smartphones, only 18% of older adults have them, and just as many own tablet devices (Smith, 2014). In this study, 24% of SNS Users used their smartphone to access SNSs, however, only SNS Users were asked what type of device they use, so comparisons cannot be made. SNS Users in the focus group indicated that they used a computer to access SNSs, but preferred using their smartphone to access Facebook and Pinterest. This suggests older adults' technology preferences and SNS usage patterns may change as they adopt new technologies.

Types of social networking sites. Almost one half of SNS users accessed Facebook, followed by YouTube and Pinterest. SNS Users also accessed Windows Live and blogs and forums, but were less likely to use Classmates.com, LinkedIn, Twitter, and dating websites. Focus group participants reported accessing Facebook and occasionally Pinterest. It is possible Facebook properties facilitate more social awareness than other sites by providing a greater understanding of others' activities within a social context, and explain why other sites are less preferred (Riedl et al, 2013).

Reasons for using social networking sites. For individuals, social networking sites can provide a social awareness and continuing knowledge of the lives and activities of their family and friends, and through this process, generate feelings of closeness and strengthen family ties (Cornejo, Tentori, & Favela, 2013). SNS Users mainly accessed SNSs to stay in touch with family and friends, and for sharing videos, pictures, music, and experiences with others. This finding was consistent with previous studies (Bell et al., 2013; Goswami et al., 2010; Hope et al, 2014; Hutto et al., 2015), especially with younger family members who were active on the same SNSs (Hope et al, 2014). American older adults' motivations for using SNSs are different from younger users, who are primarily motivated to stay in touch with friends (Zickuhr & Madden, 2012).

SNS Users were less likely to use SNSs to keep in touch with professional contacts, get opinions and keep in touch with social groups. This supports previous study results that indicated staying connected with colleagues and acquaintances and meeting new people provided a low motivation to use SNSs (Bell et al., 2013; Hope et al, 2014; Hutto & Bell, 2014; Hutto et al., 2015). Focus group members reported they used SNSs to stay in touch with family and friends, particularly younger family members who use SNSs, indicating SNS use is beneficial for intergenerational social connectedness (Hope et al., 2014). Focus group participants explained they preferred traditional methods of communication, but used SNSs because they were valued by younger family members for social interaction. Relatedly, Vroman et al.'s (2015) study found that motivation to stay in touch with family and friends translated into a preference for using email rather than SNSs.

Types of information shared. According to Riedl et al., (2013) the degree of self-disclosure and the type of self-presentation on SNSs contribute to social presence for active social network site users, and is dependent upon the content of the posts, and the medium used (Riedl et al, 2013, p. 674). Older adult users of SNS can explicitly choose who is aware of their activities by the content they share and the method they use to communicate, either publicly or privately, and actively or passively (Cornejo et al., 2013). In this study, half of SNS Users posted personal information on their SNSs, suggesting they felt security measures were sufficient to disclose their real names, picture, gender and birthday, but were less likely to share family information, location, hobbies, and interests. SNS Users indicated they primarily posted about family events, and shared information of interest, and travel places. Less often, political issues, game scores, and sports events were shared. These findings suggest SNS Users preferred sharing information that would provide a higher degree of social awareness, such as family activities, rather than more impersonal general information. Prior studies reported similar findings, and indicated older adults SNS users were comfortable putting personal information on FB, such as profile pictures, education, gender, birthday, work, and family information, but were less likely to report religious views and political views, and sports events (Hutto & Bell, 2014; Hutto et al., 2015), although oldest-older were less likely to post political views (Hope et al., 2014).

Public versus private communication. The majority of SNS Users preferred public messaging by posting comments to friend's pages, rather than private communication of sending private messages or using synchronous chat. In the focus group, members reported a low frequency of posting, and preferred other forms of

communication than messaging and instant chat. The results are consistent with prior work by Hutto and Bell (2014) who found that over half of older adult SNS users preferred public postings due to ease and quicker response times, and less than half preferred sending private messages. In contrast, Hope et al. 's (2014) study reported oldest-older adults SNS users preferred private communication, suggesting communication preferences differ among older adults, depending on age. It is possible that public posting gives a greater sense of social presence, a sense of “being there”, compared to private communication, that could account for this preference (Riedl et al, 2013).

Research question 6. Analysis confirmed communication preference, size of group memberships, length of time as a member, and social network size, were not significant predictors of social connectedness. However, there was a significant relationship between public communication preference, larger group size, greater length of time as a SNS User, and more frequent SNS Use. SNS Users were already highly socially connected regardless of SNS frequency and size of networks. The Pew Center reports that American older adult FB users socialize more frequently and have more continuous social connections on a daily basis, compared to online older adults who do not use SNSs (Smith, 2014). This finding supports the results that SNS users are socially connected.

Research question 7. Analysis confirmed age and the size of social network are significantly negatively correlated, and younger-old rural adult SNS Users tend to have larger online social networks. Overall, rural older adults in the study had smaller networks, and focus group members noted shifting social networks ties as they aged.

Previous studies supported the finding that oldest-older adults have significantly smaller social networks than younger-older adult SNS Users (Hutto & Bell, 2014; Hutto et al., 2015), including Cornwell et al.'s (2008) study of (offline) older adults that noted aging older adults had smaller network sizes, were less close to network members, and had fewer non-primary group ties, as social network connectedness shifted from interpersonal to associational networks (Cornwell et al., 2008). However, the study found no relationship between age and network density, rather it was the frequency of interaction with network members that increased closeness with others (Cornwell et al., 2008). Given these characteristics, it may be possible that social networking can increase social connectedness.

Research question 8. Analysis confirmed social connectedness was not a predictor of SNS use, when controlling for age, gender, race, marital status, education and income. Socially connected rural older adults in the study were not more likely to use SNSs. SNS Users in the study had only slightly higher average social connectedness scores than Non-users, and there was little variation between the groups except in demographic variables. There are no prior studies of older adult social connectedness and SNS use to compare this finding.

Research question 9. Analysis of the focus group discussion revealed four categories representing the factors influencing SNS use and social connectedness: a) SNS user characteristics b) communication preferences on SNSs c) social connectedness, and d) non-SNS user characteristics. The overall theme of the discussion was the preference for traditional methods of communication, even for SNS Users in the group. All the participants reported they felt socially connected, and using SNSs augmented, rather than

substituted for, personal social interaction by phone or face-to face. This qualitative finding is supported by quantitative results that indicated the majority of rural older adults in the study felt SNS Use does not affect their face-to-face communication, and one quarter felt it had “somewhat” of an effect, and a few felt it replaces most face to face communication.

Conclusion

A growing body of evidence suggests social networking technology can provide a mechanism for creating and sustaining older adult social relationships and active participation in reciprocal information-sharing with others (Coelho & Duarte, 2016). Online relationships between the constructs of social presence, social awareness, and social connectedness are influenced by structural properties of the users’ network size and frequency of use, and functional properties that are subjective properties of communication behavior (Riedl et al., 2013). Rural older adults in the study, both SNS Users and Non-users, were already socially connected and SNS Use did not increase their level of social connectedness. As younger generations become 65 years and older, cultural norms of SNS use may change this dynamic. Currently, rural older adults prefer traditional methods of maintaining social connections, even with SNS access.

Limitations

This was a small-scale study to explore the SNS use of rural elderly. Use of a convenience sample may have posed a threat to internal validity, because differences in outcomes between the groups may have been due to group differences rather than the effect of the independent variables (Polit & Beck, 2011). Another problem was the small sample size that may be a limitation in terms of power (Polit & Beck, 2011). The

research design was not an experimental design, therefore competing explanations for outcomes could not be ruled out, raising the threat to internal validity (Polit & Beck, 2011). The sample is not representative of the population and generalizations cannot be made, causing a threat to the external validity of the study (Polit & Beck, 2011). Participant bias may have occurred, as people who participated in the study were recruited from senior centers, health fairs, community events and other public places outside their home. Response to flyers to home-bound individuals led to only one participant. This may have caused the sample to be more high functioning, and more likely to socialize and participate in events, which may raise the social connectedness scores. With the descriptive analysis portion of the study, causality cannot be inferred (Polit & Beck, 2011). The social connectedness scale is population specific, which may have caused differences when applied to an older population. Additionally, the sample was mainly Caucasian, with a deficiency of participants representing other ethnicities, which may have limited the detection of differences between SNS Users and Non-users.

Implications

This study demonstrated that younger-old rural adults are more likely to be SNS users. As rural adults become baby boomers, a growing population of rural older adults are more likely to be SNS users. Government health agencies and healthcare practitioners can use SNSs as a tool to maintain and improve social connectedness in this population.

Access and ability to use SNSs increase the likelihood of SNS use. Few of the rural senior centers in this study had computers for senior use, and none were adapted to older adult needs. Assistance accessing the computers came from willing individuals,

and there were no formal programs to develop computer literacy. There is a need for technology support and training to increase self-efficacy for rural older adults who want to use SNSs. Resource allocation for tablets and computers (designed for older adults) for rural senior centers is needed, to provide access to SNSs and professional monitoring for privacy and security of the sites. Computer literacy programs for older adults with ongoing face-to-face support would be beneficial for older adults wanting to learn how to use SNSs or improve technical skills to communicate with family and friends.

In this study, most senior centers had a Facebook page, but they were not always updated. Senior center resources and activities were difficult to find. Technical improvement of the design would enhance SNS users' ability to connect with other members, and provide a further vehicle for social connections and health information.

Hospital patient records are online, which may motivate rural older adults to use computers and consequently SNSs, for the dissemination of health information and links to resources and health communities pertinent to rural older adults. Doctors' offices and hospital waiting rooms could provide tablets and Internet for rural older adults to access SNSs while waiting for services. Doctors and hospitals need to develop information and services designed for SNSs that older adults can access.

SNS users' main motivation is to stay in contact with family and friends. SNSs have the potential to connect rural older adults who are socially isolated, and provide an intervention strategy for healthcare practitioners. Understanding the motivations and barriers for SNS use can aid in designing and tailoring interventions to meet the specific needs of this population in a rural context.

Recommendations for Future Research

Studies have measured social isolation and disconnectedness in various forms, such as social role satisfaction, loneliness, social interaction, and social connectedness. Further research is needed to develop age and culturally appropriate instruments to measure social isolation and social health factors. Future research may benefit from extending sampling to both rural and urban older adults, and other ethnicities, in order to capture a broader group of SNS users in different cultural contexts. Further studies examining and comparing specific types of SNSs will broaden our understanding of SNSs and social connectedness. Further studies to assess the SNS use of specific rural communities are needed, in order to develop interventions and strategies to improve health outcomes for specific populations. Further research is needed to understand the role of SNS Use and health, to maintain and improve quality of life for this population.

References

- Ashida, S. & Heaney, C. A. (2008). Differential associations of social support and social connectedness with structural features of social networks and the health status of older adults. *Journal of Aging & Health*, 20(7), 872–893.
doi: 10.1177/0898264308324626
- Bacsu, J. R., Jeffery, B., Johnson, S., Martz, D., Novik, N., & Abonyi, S. (2012). Healthy aging in place: Supporting rural seniors' health needs. *Online Journal of Rural Nursing & Health Care*, 12(2), 77–87. Retrieved
from <http://eds.a.ebscohost.com.libpublic3.library.isu.edu/eds/pdfviewer/pdfviewer?vid=25&sid=e4a210e6-57bc-43d9-9189-fe8d7ea4803b%40sessionmgr4003&hid=4205>
- Bell, C., Fausset, C., Farmer, S., Nguyen, J., Harley, L., & Fain, W. B. (2013). Examining social media use among older adults. In *Proceedings of the 24th ACM Conference on Hypertext and Social Media* (pp. 158–163). New York, NY, USA: ACM. doi:10.1145/2481492.2481509
- Boyd, D. M. & Ellison, N. B. (2007). Social network sites: Definition, history, and scholarship. *Journal of Computer-Mediated Communication*, 13(1), 210–230.
doi: 10.1111/j.1083-6101.2007. 00393.x
- Bradley, P. (2015). I don't want to be alone. *British Journal of Healthcare Assistants*, 9(8), 408–411. doi: 10.12968/bjha.2015.9.8.408
- Braun, K. (2012). Obstacles to social networking website use among older adults. *Computers in Human Behavior*, 29(3), 673- 680. doi: 10.1016/j.chb.2012.12.004
- Burholt, V., & Scharf, T. (2014). Poor health and loneliness in later life: The role of depressive symptoms, social resources, and rural environments. *Journals of*

Gerontology Series B: Psychological Sciences & Social Sciences, 69(2), 311–324.

Retrieved

from [http://eds.b.ebscohost.com.libpublic3.library.isu.edu/eds/pdfviewer/pdfviewer?sid=b05475dc-1a8d-4672-b082-](http://eds.b.ebscohost.com.libpublic3.library.isu.edu/eds/pdfviewer/pdfviewer?sid=b05475dc-1a8d-4672-b082-72b5165594d4%40sessionmgr113&vid=1&hid=117)

[72b5165594d4%40sessionmgr113&vid=1&hid=117](http://eds.b.ebscohost.com.libpublic3.library.isu.edu/eds/pdfviewer/pdfviewer?sid=b05475dc-1a8d-4672-b082-72b5165594d4%40sessionmgr113&vid=1&hid=117)

Burke, M., Kraut, R., & Marlow, C. (2011). Social capital on Facebook: Differentiating uses and users. In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems*, 571–580. doi: 10.1145/1978942.1979023

Capanna, C., Stratta, P., Collazzoni, A., D'Ubaldo, V., Pacifico, R., Di Emidio, G., Ragusa, M., & Rossi, A. (2013). Social connectedness as resource of resilience: Italian validation of the Social Connectedness Scale – Revised. *Journal of Psychopathology*, 19, 320-326. Retrieved from

<http://www.jpsychopathol.it/issues/2013/vol19-4/05-Capanna.pdf>

Centers for Disease Control and Prevention (CDC) (2008) *Promoting Individual, Family, and Community Connectedness to Prevent Suicidal Behavior*. Centers for Disease Control and Prevention (CDC), National Center for Injury Prevention and Control, 2008. Retrieved April 6, 2016 from

https://www.cdc.gov/violenceprevention/pdf/suicide_strategic_direction_full_version-a.pdf

Coelho, J. & Duarte, C. (2016). A literature survey on older adults' use of social network services and social applications. *Computers in Human Behavior*, 58, 187- 205. doi: 10.1016/j.chb.2015.12.053

- Cornejo, R., Tentori, M., Favela, J. (2013). Ambient awareness to strengthen the family social network of older adults. *Computer Supported Cooperative Work*, 22, 309–344. doi: 10.1007/s10606-012-9166-2
- Cornwell, B., Laumann, E. O., & Schumm, L. P. (2008). The social connectedness of older adults: A national profile. *American Sociological Review*, 73(2), 185–203. doi: 10.1177/000312240807300201
- Cornwell, E. Y., & Waite, L. J. (2009). Measuring social isolation among older adults using multiple indicators from the NSHAP Study. *The Journals of Gerontology Series B: Psychological Sciences and Social Sciences*, 64B(suppl 1), i38–i46. doi: 10.1093/geronb/gbp037
- Dautovich, N. D., Shoji, K. D., Stripling, A. M., & Dzierzewski, J. M. (2014). Clinical Geropsychology: Treatment and research approaches with rural older adults. *Clinical Gerontologist*, 37(1), 64–75. doi: 10.1080/07317115.2014.847312
- Dickens, A. P., Richards, S. H., Greaves, C. J., & Campbell, J. L. (2011). Interventions targeting social isolation in older people: A systematic review. *BMC Public Health*, 11647. doi: 10.1186/1471-2458-11-647
- Dongre, A. R., & Deshmukh, P. R. (2012). Social determinants of quality of elderly life in a rural setting of India. *Indian Journal of Palliative Care*, 18(3), 181–195. doi: 10.4103/0973-1075.105688
- Duggan & Brenner, (2013). *The demographics of social media users, 2012* (Vol. 14). Pew Research Center's Internet & American Life Project. www.pewresearch.org/
Retrieved April 19, 2016
from <http://www.lateledipenelope.it/public/513cbff2daf54.pdf>

- Duggan, M., Ellison, N. B., Lampe, C., Lenhart, A., & Madden, M. (2015). *Social Media Update 2014*. Pew Research Center, January 2015. www.pewresearch.org/
Retrieved April 19, 2016 from <http://www.foothillspresbytery.org/wp-content/uploads/sites/175/2015/07/Social-Media-Site-Usage-2014--Pew-Research-Centers-Internet-American-Life-Project.pdf>
- Federal Interagency Forum on Aging-Related Statistics. (2012). *Older Americans 2012: Key indicators of well-being*. Federal Interagency Forum. Retrieved from http://www.agingstats.gov/main_site/data/2012_documents/docs/entirechartbook.pdf
- Feng, D., Ji, L., & Xu, L. (2013). The influence of social support, lifestyle and functional disability on psychological distress in rural China: Structural equation modelling. *Australian Journal of Rural Health*, 21(1), 13–19. doi: 10.1111/ajr.12009
- Fiori, K. L., Antonucci, T. C., & Cortina, K. S. (2006). Social network typologies and mental health among older adults. *The Journals of Gerontology Series B: Psychological Sciences and Social Sciences*, 61(1), P25-P32. Retrieved from https://www.researchgate.net/profile/Katherine_Fiori/publication/7371759_Social_network_typologies_and_mental_health_among_older_adults/links/541b17140cf2218008c00edb.pdf
- Fukunaga, R., Abe, Y., Nakagawa, Y., Koyama, A., Fujise, N., & Ikeda, M. (2012). Living alone is associated with depression among the elderly in a rural community in Japan. *Psychogeriatrics*, 12(3), 179–185. doi: 10.1111/j.1479-8301.2012.00402.x

- Galloway, A. P., & Henry, M. (2014). Relationships between social connectedness and spirituality and depression and perceived health status of rural residents. *Online Journal of Rural Nursing & Health Care*, 14(2), 43–79.
doi: 10.14574/ojrnhc.v14i2.325
- Gibson, L., Moncur, W., Forbes, P., Arnott, J., Martin, C., & Bhachu, A. S. (2010, September). Designing social networking sites for older adults. In *Proceedings of the 24th BCS Interaction Specialist Group Conference* (pp. 186-194). British Computer Society. Retrieved from
file:///G:/NEW%20DISS_Article_Gibson%202009.pdf
- Golden, J., Conroy, R. M., Bruce, I., Denihan, A., Greene, E., Kirby, M., & Lawlor, B. A. (2009). Loneliness, social support networks, mood and wellbeing in community-dwelling elderly, *International Journal of Geriatric Psychiatry* 24(7). 694 -700. doi: 10.1002/gps.2181
- Golden, J., Conroy R. M., & Lawlor, B. A. (2009). Social support network structure in older people: Underlying dimensions and association with psychological and physical health. *Psychology, Health & Medicine*, 14(3), 280–290.
doi: 10.1080/13548500902730135
- Goswami, S., Köbler, F., Leimeister, J. M., & Krcmar, H. (2010). Using online social networking to enhance social connectedness and social support for the elderly. *Thirty First International Conference on Information Systems, St. Louis*.
Retrieved from http://aisel.aisnet.org/icis2010_submissions/109/

- Hawton, A., Green, C., Dickens, A., Richards, S., Taylor, R., Edwards, R., ...Campbell, J. (2011). The impact of social isolation on the health status and health-related quality of life of older people. *Quality of Life Research*, 20(1), 57–67. doi: 10.1007/s11136-010-9717-2
- Heenan, D. (2011). How local interventions can build capacity to address social isolation in dispersed rural communities: A case study from Northern Ireland. *Ageing International*, 36(4), 475–491. doi: 10.1007/s12126-010-9095-7
- Hill, W., Weinert, C., & Cudney, S. (2006). Influence of a computer intervention on the psychological status of chronically ill rural women: Preliminary results. *Nursing Research*, 55(1), 34. Retrieved from <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1484522/>
- Holt-Lunstad, J., Smith, T. B., & Layton, J. B. (2010). Social relationships and mortality risk: A meta-analytic review. *PLoS Medicine*, 7(7), 1–20. doi: 10.1371/journal.pmed.1000316
- Hope, A., T. Schwaba, T., & Piper, A. M. (2014). Understanding digital and material social communications for older adults. *Proceedings of the SIGCHI conference on human factors in computing systems*. CHI '14, ACM, New York, NY, U.S. A. 3903–3912. doi: [acm.org.libpublic3.library.isu.edu/10.1145/2556288.2557133](https://doi.org/10.1145/2556288.2557133)
- Hutto, C. J. & Bell, C. (2014). Social media gerontology: Understanding social media usage among a unique and expanding community of users. *47th Hawaii International Conference on System Science*, 1755-1764. IEE Computer Society. doi: 10.1109/HICSS.2014.223
- Hutto, C. J., Bell, C., Farmer, S., Fausset, C., Harley, L., Nguyen, J., & Fain, B. (2015).

- Social media gerontology: Understanding social media usage among older adults. *Web Intelligence (2405-6456)*, 13(1), 69–87. doi: 10.3233/WEB-150310
- Institute of Medicine (2004). *Quality through collaboration: The future of rural health*. Washington, DC: National Academies Press. Retrieved from <http://nationalacademies.org/hmd/reports/2004/quality-through-collaboration-the-future-of-rural-health.aspx>
- Jansson, A. (2015). The molding of mediatization: The stratified indispensability of media in close relationships. *Communications: The European Journal of Communication Research*, 40(4), 379–401. doi: 10.1515/commun-2015-0021
- Joinson, A. N. (2008). Looking at, looking up or keeping up with people? Motives and use of Facebook. In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems*, 1027–1036. ACM. doi: 10.1145/1357054.1357213
- Kaplan, A. M., & Haenlein (2010). Users of the world, unite! The challenges and opportunities of Social Media. *Business Horizons*, 53, 59 - 68. Retrieved April 19, 2016 from <http://michaelhaenlein.com/Publications/Kaplan,%20Andreas%20-%20Users%20of%20the%20world,%20unite.pdf>
- Lee, R. M. & Lee, S. (2001). Social connectedness, dysfunctional interpersonal behaviors, and psychological distress: Testing a mediator model. *Journal of Counseling Psychology*, 48(3), 310-318. doi: 10.1037///0022-0167
- Lehtinen, V., Näsänen, J., & Sarvas, R. (2009). A little silly and empty-headed: Older adults' understandings of social networking sites. In *Proceedings of the 23rd British HCI Group Annual Conference on People and Computers: Celebrating People and Technology*, 45-54. British Computer Society. Retrieved

from http://delivery.acm.org/10.1145/1680000/1671017/p45-lehtinen.pdf?ip=159.118.223.137&id=1671017&acc=ACTIVE%20SERVICE&key=4D4702B0C3E38B35%2E4D4702B0C3E38B35%2E54ACE385DD1DF184%2E4D4702B0C3E38B35&CFID=774290525&CFTOKEN=74497201&__acm__=1461284170_e6e94ea36e5b51f2e13519296680a402

- Leist, A. (2013). Social media use of older adults: A mini-review. *GERONTOLOGY*, 59(4), 378–384. doi: 10.1159/000346818
- Levasseur, M., Cohen, A. A., Dubois, M.-F., G  n  reux, M., Richard, L., Therrien, F. H., & Payette, H. (2015). Environmental factors associated with social participation of older adults living in metropolitan, urban, and rural areas: The NuAge study. *American Journal of Public Health*, 105(8), 1718–1725. doi: 10.2105/AJPH.2014.302415
- Lin, K., Yin, P., & Loubere, N. (2014). Social support and the “left behind” elderly in rural China: A case study from Jiangxi Province. *Journal of Community Health*, 39(4), 674–681. doi: 10.1007/s10900-014-9864-4
- Marmot, M. (2013). Fair society healthy lives. In N. Eyal, S. A. Hurst, O. F. Norheim, & D. Wikler (Eds.). *Inequalities in Health: Concepts, Measures, and Ethics*. (pp. 282- 299). Oxford University Press.
- Merema, M. R. (2014). An update on social activity and depression in the elderly: A brief review of recent findings and key issues. *Healthy Aging & Clinical Care in the Elderly*, (6), 11–15. doi: 10.4137/HACCE.S12499

- Morris, M. E., Adair, B., Ozanne, E., Kurowski, W., Miller, K. J., Pearce, A. J., ... Said, C. M. (2014). Smart technologies to enhance social connectedness in older people who live at home. *Australasian Journal on Ageing*, 33(3), 142–152.
doi: 10.1111/ajag.12154
- National Institute on Aging. (2011, July 5). *Living long & well in the 21st century: Strategic directions for research on aging* [Text]. Retrieved April 20, 2016, from <https://www.nia.nih.gov/about/living-long-well-21st-century-strategic-directions-research-aging>
- Nicholson, N. R. (2008). Social Isolation in older adults: An evolutionary concept analysis. *Journal of Advanced Nursing*. 65(6), 1342-1352. doi: 10.1111/j.1365-2648.2008.04959.x
- Nimrod, G. (2013). Probing the audience of seniors' online communities. *Journals of Gerontology Series B: Psychological Sciences & Social Sciences*, 68(5), 773–782. doi: org/geronb/gbt059
- Norval, C., Arnott, J., & Hanson, V. L. (2014). What's on your Mind? Investigating recommendations for inclusive social networking and older adults. *Session: Engaging Older Adults Through Technology CHI 2014*, One of a CHIInd, Toronto, ON, Canada. doi: 10.1145/2556288.2556992
- Perrin, A. (2015). *Social networking usage: 2005-2015*. Pew Research Center. October 2015. www.pewresearch.org/. Retrieved April 19, 2017
from <http://www.pewinternet.org/2015/10/08/2015/Social-Networking-Usage-2005-2015/>
- Pierce, C. & Scherra, E. (2004). The challenges of data collection in rural dwelling

- samples. *Online Journal of Rural Nursing and Health Care*, 4 (2), 25-30.
- Retrieved from file:///C:/Users/Owner/Downloads/197-1107-1-PB%20(2).pdf
- Polit, D. F., & Beck, C. T. (2011). *Nursing research: Generating and assessing evidence for nursing practice* (9th ed.). Philadelphia, PA: Lippincott, Williams, & Wilkins.
- Reed, S. B., Crespo, C. J., Harvey, W., & Andersen, R. E. (2011). Social isolation and physical inactivity in older US adults: Results from the Third National Health and Nutrition Examination Survey. *European Journal of Sport Science*, 11(5), 347–353. doi: 10.1080/17461391.2010.521585
- Riedl, C., Köbler, F., Goswami, S., & Krcmar, H. (2013). Tweeting to feel connected: A model for social connectedness in online social networks. *International Journal of Human-Computer Interaction*, 29(10), 670-687.
- doi: 10.1080/10447318.2013.768137
- Sadana, R., Blas, E., Budwanhi, S., Koller, T., & Paraje, G. (2016). Healthy ageing: Raising awareness of inequalities, determinants, and what could be done to improve health equity. *Gerontologist*, 56, (S2), S178–S193.
- doi:10.1093/geront/gnw034
- Sawada, Y., Shinohara, R., Sugisawa, Y., & Anme, Y. (2011). The relation between the maintenance of physical functions and social interaction among community-dwelling elderly people: A six-year follow-up study. *Journal of Physical Therapy Science*, 23(2), 171–175. doi: 10.1589/jpts.23.171
- Sinha, S. P., Shrivastava, S. R., & Ramasamy, J. (2013). Depression in an older adult rural population in India. *MEDICC Review*, 15(4), 41–44. Retrieved from <http://eds.a.ebscohost.com.libpublic3.library.isu.edu/eds/pdfviewer/pdfview>

er?sid=caa3ed22-3f1b-4957-903f-

2de98de83359%40sessionmgr4002&vid=1&hid=4105

- Siriaraya, P., Ang, C. S., & Bobrowicz, A. (2014). Exploring the potential of virtual worlds in engaging older people and supporting healthy aging. *Behaviour & Information Technology*, 33(3), 282–293. doi: 10.1080/0144929X.2012.691552
- Smith, S. (2014). *Older adults and technology use*. Pew Research Center. April 2014. www.pewresearch.org/. Retrieved April 19, 2016 from <http://www.pewinternet.org/2014/04/03/older-adults-and-technology-use/>
- Sobczak, J. A. (2007). Measurement in rural research: Matching the measurement to the population. In L. L. Morgan & P. S. Fahn (Eds.). *Conversations in the disciplines: Sustaining rural populations*, 149-172. Global Academic Publishing.
- Sohini, & Mishra, A. J. (2015). Social exclusion of the Indian rural aged: A study of Jhansi District in Uttar Pradesh. *Indian Journal of Gerontology*, 29(2), 231–244.
- Step toe, A., Shankar, A., Demakakos, P., & Wardle, J. (2013). Social isolation, loneliness, and all-cause mortality in older men and women. *Proceedings of the National Academy of Sciences*, 110(15), 5797–5801. doi: 10.1073/pnas.1219686110
- SurveyMonkey (n.d.). Online Social Networking Questionnaire. Retrieved April 26, 2016 from <https://www.surveymonkey.com/r/?sm=2AiHmNhS%2BAIJ7fWJ9Es9jg%3D%3D>

- U. S. Department of Agriculture. Economic Research Service (2013). *Rural-Urban Continuum Codes*. Retrieved April 6, 2016 from <https://www.ers.usda.gov/data-products/rural-urban-continuum-codes/>
- Vroman, K. G., Arthnat, S., & Lysack, C. (2015). Who over 65 is online? Older adults' dispositions toward information communication technology. *Computers in Human Behavior*, 43,156–166. doi: 10.1016/j.chb.2014.10.018
- Warburton, J., Cowan, S., & Bathgate, T. (2013). Building social capital among rural, older Australians through information and communication technologies: A review article. *Australasian Journal on Ageing*, 32(1), 8–14. doi: 10.1111/j.1741-6612.2012.00634.x
- Weinert, C., Cudney, S., & Hill, W. (2008). Rural women, technology and self-management of chronic illness. *Canadian Journal of Nursing Research*, 40(3), 114-134. Retrieved from <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2700733/>
- Werner, C. A. (2011). *The older population: 2010*. U.S. Department of Commerce, Economics and Statistics Administration, U.S. Census Bureau. Retrieved April 6, 2016 from <https://www.census.gov/prod/cen2010/briefs/c2010br-09.pdf>
- Winters, C. (2013). *Rural nursing: concepts, theory and practice* (4th ed.). New York, NY: Springer Publishing Company.
- Winters, C.A., Cudney, S., & Sullivan, T. (2010). Expressions of depression in rural women with chronic illness. *Rural and Remote Health*, 10, 1533. Retrieved from http://www.rrh.org.au/publishedarticles/article_print1533.pdf

- World Health Organization, Commission on Social Determinants of Health.
- (2008). *Closing the gap in a generation: Health equity through action on the social determinants of health: Commission on Social Determinants of Health final report*. Geneva, Switzerland. Retrieved from http://www.who.int/social_determinants/thecommission/finalreport/en
- World Health Organization. (1997). WHOQL: Measuring Quality of Life. Division of Mental Health and Prevention of Substance Abuse. www.who.int/. Retrieved April 6, 2016 from http://www.who.int/mental_health/media/68.pdf
- World Health Organization, Commission on Social Determinants of Health (CSDH) (2008). *Closing the gap in a generation: health equity through action on the social determinants of health*. Final Report of the Commission on Social Determinants of Health. <http://www.who.int/>. Retrieved April 6, 2016 from http://www.who.int/social_determinants/final_report/csdh_finalreport_2008.pdf.
- World Health Organization. (2015). World report on ageing and health. www.who.int/. Retrieved from <http://www.who.int/ageing/events/world-report-2015-launch/en/>
- Wu, Z., Sun, L., Sun, Y., Zhang, X., Tao, F., & Cui, G. (2010). Correlation between loneliness and social relationship among empty nest elderly in Anhui rural area, China. *Aging & Mental Health*, 14(1), 108–112.
doi: 10.1080/13607860903228796
- Xie, B., Watkins, I., Golbeck, J., & Huang, M. (2012). Understanding and changing older adults' perceptions and learning of social media. *Educational Gerontology*, 38(4), 282–296. doi: 10.1080/03601277.2010.544580
- Zickuhr, K. & Madden, M. (2012). Older adults and Internet use: For the first time, half

of adults ages 65 and older are online. Pew Research Center's Internet & American Life Project. Retrieved April 3, 2016 from http://www.pewinternet.org/files/old-media/Files/Reports/2012/PIP_Older_adults_and_internet_use.pdf

APPENDIX A

Instrumentation

APPENDIX A – 1

Demographic Questionnaire

Age

What is your age? _____ Or

What is your month and year of birth? (MM/YYYY) _____/_____

Sex

What is your sex?

- ☐ Male
- ☐ Female

Race/ethnicity

How do you describe yourself? (please check the one option that best describes you)

- ☐ American Indian or Alaska Native
- ☐ Hawaiian or Other Pacific Islander
- ☐ Asian or Asian American
- ☐ Black or African American
- ☐ Hispanic or Latino
- ☐ White

Marital status

Are you:

- ☐ Married
- ☐ Divorced
- ☐ Widowed
- ☐ Separated
- ☐ Never been married
- ☐ A member of an unmarried couple

Education completed

What is the highest grade or year of school you completed?

- o Never attended school or only attended kindergarten
- o Grades 1 through 8(Elementary)
- o Grades 9 through 11 (Some high school)
- o Grade 12 or GED (High school graduate)
- o College 1 year to 3 years (Some college or technical school)
- o College 4 years (College graduate)
- o Graduate School (Advance Degree)

Household Income

What was your total household income before taxes during the past 12 months?

- o Less than \$30,000
- o \$30,000 to \$49,999
- o \$50,000 to \$69,999
- o \$70,000 to \$99,999
- o \$75,000 to \$99,999
- o \$100,000 or more

APPENDIX A – 2

Social Connectedness Scale – Revised (SCS-R; Lee & Lee, 2001).

The scale is comprised of 20 items set on a six point Likert scale (1 = Strongly Agree, 6 = Strongly Disagree), with ten positive and ten negative questions.

Answers to the 10 negative questions are reversed scored, and there are no subscales. Scores are summated and range from 20 to 120, with higher scores indicating greater levels of social connectedness. An item mean score with a possible range from 1 to 6 can also be calculated by dividing the total scale score by 20 (or the number of scale items). A mean item score equal or greater than 3.5 (slightly agree to strongly agree) as indicating a greater tendency to feel socially connected.

Directions: Following are a number of statements that reflect various ways in which we view ourselves. Rate the degree to which you agree or disagree with each statement using the following scale (1 = Strongly Disagree and 6 = Strongly Agree). There is no right or wrong answer. Do not spend too much time with any one statement and do not leave any unanswered.

Strongly Disagree 1 Disagree Mildly 2 Disagree 3 Mildly Agree 4 Agree 5 Strongly Agree 6

1. I feel distant from people.....1 2 3 4 5 6
2. I don't feel related to most people.....1 2 3 4 5 6
3. I feel like an outsider.....1 2 3 4 5 6
4. I see myself as a loner.....1 2 3 4 5 6
5. I feel disconnected from the world around me..... 1 2 3 4 5 6
6. I don't feel I participate with anyone or any group..... 1 2 3 4 5 6
7. I feel close to people..... 1 2 3 4 5 6

8. Even around people I know, I don't feel that I really belong.....1 2 3 4 5 6
9. I can relate to my peers.....1 2 3 4 5 6
10. I catch myself losing a sense of connectedness with society.....1 2 3 4 5 6
11. I can connect with other people.....1 2 3 4 5 6
12. I feel understood by the people I know.....1 2 3 4 5 6
13. I see people as friendly and approachable.....1 2 3 4 5 6
14. I fit in well in new situations.....1 2 3 4 5 6
15. I have little sense of togetherness with my peers.....1 2 3 4 5 6
16. My friends feel like family.....1 2 3 4 5 6
17. I find myself actively involved in people's lives.....1 2 3 4 5 6
18. Even among my friends, there is no sense of brother/sisterhood.....1 2 3 4 5 6
19. I am in tune with the world.....1 2 3 4 5 6
20. I feel comfortable in the presence of strangers.....1 2 3 4 5 6

Reference

Lee, R. M. & Lee, S. (2001). Social connectedness, dysfunctional interpersonal behaviors, and psychological distress: Testing a mediator model. *Journal of Counseling Psychology*, 48(3), 310-318. doi: 10.1037//0022-0167

APPENDIX A – 3

Social Networking Site Survey (SurveyMonkey Inc., n.d.)

1. Do you own or have access to a computer?

- ☐ Yes
- ☐ No

2. Do you use a computer at a library or community/senior center?

- ☒ Yes
- ☐ No

3. Do you have internet at home?

- ☐ Yes
- ☐ No

4. How comfortable are you using the internet?

- ☐ Extremely comfortable
- ☐ Very comfortable
- ☐ Somewhat comfortable
- ☐ Not very comfortable
- ☐ Not at all comfortable
- ☐ Do not use the internet

5. Which of the following best describes how you get your news and information?

- ☒ Prefer reading newspapers and magazines in print
- ☐ Prefer reading newspapers and magazines online
- ☐ Use both
- ☐ Does not apply/ get news from other sources

6. Are you a member of an online Social Networking Site?

- ☐ Yes
- ☐ No

7. If your answer to the above question is No, then choose the reason why? (You can choose more than one)

- ☐ I don't know what online social networking is
- ☐ I am not interested in joining online social networking sites.
- ☐ I joined once, but I didn't enjoy it
- ☐ It's against my culture
- ☐ I do not have access to a computer
- ☐ Social networking sites seem complicated
- ☐ No Privacy

List any other reasons:

8. Do you think online Social Networking Sites are important?

- ☐ Strongly agree
- ☐ Agree
- ☐ Fair
- ☐ Disagree
- ☐ Strongly disagree

9. Do you think privacy policies are effective in online Social Networking Site?

- ☐ Strongly agree
- ☐ Agree
- ☐ Disagree
- ☐ Strongly disagree

If you use social media sites please continue

10. How many online Social Networking Site communities/ groups are you a member of?

- ☐ None
- ☐ 1-3
- ☐ 4-10
- ☐ 11-50
- ☐ Above 50

11. Please select all online Social Networking Sites for which you have created a personal profile (You can choose more than one)

- ☐ Facebook
- ☐ Twitter
- ☐ YouTube
- ☐ Windows Live
- ☐ LinkedIn
- ☐ Classmates.com
- ☐ Pinterest
- ☐ Dating Website
- ☐ Blogs/Forums

List any other websites:

12. How do you access your online Social Networking Site account? (You can choose more than one)

- ☐ Home computer or laptop
- ☐ Shared computer
- ☐ Work computer
- ☐ Smartphone
- ☐ iPod \ iPad tablet device

Others:

13. How long have you been using online Social Networking Sites?

- ☐ Less than a month
- ☐ 1 - 6 months
- ☐ 7 months to a year
- ☐ More than a year

14. Who introduced you to or told you about online Social Networking Sites for the first time?

- ☐ A family member other than a spouse
- ☐ Friend
- ☐ Coworker
- ☐ Spouse
- ☐ Other

- ☐ Do not recall/no one introduced me
- ☐ Don't know

15. On average, how much time do you spend daily on online Social Networking Site?

- ☐ Less than 1 hour
- ☐ 1 – 6 hrs per day
- ☐ 7 - 12 hrs per day
- ☐ 13 - 24 hrs per day

16. How many contacts/friends do you have on the online Social Networking Sites?

- ☐ Fewer than 10
- ☐ 10 - 29
- ☐ 30 – 49
- ☐ 50- 69
- ☐ 70-89
- ☐ More than 90

17. Which of the following are you connected to, friends with, or follow on the online Social Networking Sites? (you can choose more than one)

- ☐ Your children
- ☐ Your grandchildren
- ☐ Your relatives other than children and grandchildren
- ☐ None

18. Do you accept strangers who try to friend you in online Social Networking Sites?

- ☐ Yes
- ☐ Sometimes
- ☐ No

19. Why do you use an online Social Networking Site? (you can choose more than one choice)

- ☐ To find information
- ☐ To play games
- ☐ To keep in touch with professional and business contacts
- ☐ To keep in touch with family and friends

- ☐ To make new friends
- ☐ To get opinions
- ☐ To share videos/ pictures/ music
- ☐ To share your experience

List any other reasons:

20. What information do you share on your online social networking profile? (you can choose more than one choice)

- ☐ Email
- ☐ Real name
- ☐ Profile picture
- ☐ Gender
- ☐ Birthday
- ☐ Work and/or family information
- ☐ Hobbies
- ☐ Town
- ☐ Status
- ☐ Interests
- ☐ Pictures
- ☐ Videos
- ☐ Religious Views
- ☐ Political Views
- ☐ Favorite Quotations
- ☐ Mobile

Others:

21. What type of information do you post on online Social Networking Sites? (you can choose more than one choice)

- ☐ Family events
- ☐ Travel/places
- ☐ Random information and interesting things
- ☐ Political issues

☐ Sports events

☐ Game scores

List any other:

22. How do you prefer to communicate on online social Networking Sites? (one choice)

☐ Posting comments to friend's pages

☐ Sending private messages

☐ Instant chat

List any other:

23. How does online social networking affect your social life?

☐ Does not influence face to face communication

☐ Somewhat has an effect on face to face communication

☐ Replaces most face to face communication

References

SurveyMonkey (n.d.). Online Social Networking Questionnaire. Retrieved April 26, 2016 from <https://www.surveymonkey.com/r/?sm=2AiHmNhS%2BAIJ7fWJ9Es9jg%3D%3D>