DOES SNS USAGE BY OLDER ADULTS REDUCE LONELINESS?

DOES SOCIAL NETWORKING SITE USAGE BY OLDER ADULTS REDUCE LONELINESS?

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Abstract

As the use of social networking sites (SNSs) has become more wide-spread, some age groups have taken to the media much more readily than other groups. Older adults are lagging behind in their adoption of SNSs, while this group of the population tends to be more socially isolated and lonely. In this thesis, the uses of SNSs have been broken down into different components such as the intimacy level of the message content, types of contacts, etc. A framework for social capital is utilized, in order to bridge the knowledge gap between how older adults use social networking sites to gauge its impact on loneliness. The findings suggest that the use of SNSs increases social capital but does not directly reduce loneliness. The impact of the increase of social capital by using SNSs on loneliness is negligible. However, increased social capital due to SNSs use tends to moderate the effects that health status, financial wellbeing and satisfaction with offline relationships have on loneliness.

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List of Abbreviations and Symbols

AVE –Average Variance Extracted

BOSC – Bonding Social Capital

BRISC – Bridging Social Capital

CB-SEM - Covariance Based Structural Equation Model

CR – Composite Reliability

HTMT – Heterotrait-Monotrait Ratio

ICT – Information and Communication Technology

IT – Information Technology

IT/IS – Information Technology/Information Systems

NFI – Normal fixed Index

PLS-SEM - Partial Least Square Structural Equation Model

SNS - Social networking Site

SRMR - Standardized Root Mean Square Residual

VIF- Variance Inflation Factor

1. Introduction

"Loneliness is the ultimate poverty."
Pauline Phillips (Dear Abby)

Loneliness is a painful emotion, for individuals who are lacking in social relationships. In a society that feels every individual has merit and is important, the loneliness of individuals is a large societal failing. Thus, creating ways in which to alleviate or reduce loneliness is very important for the wellbeing of both the individual and society.

In recent years, the use of social media has become more popular, with a 21% increase in use of social media in 2017 globally (Chaffey, 2017). Social networking sites (SNSs) are now used by all age groups, although those over the age of 65 have been the slowest group to adopt this technology. Pew Research found that by the end of 2016 86% of Americans between the ages of 18-29 used social media whereas, only 34% of Americans over 65 use social media (Pew Research, 2017). Social networking is used as a tool to nurture both business and personal social relationships. Older adults are at increased risk of losing social connections due to changes in their lives (Victor et al., 2000), resulting in possible negative impacts on their quality of life and health. Thus, a primary issue facing older adults in Canada is keeping socially connected and active (International Federation of Aging, 2012). Yet, many older adults have not realized the value of social networking in supporting social relationships.

In Canada over 24% of individuals, aged 65 or older reported that they felt a need to participate more in social activities, with 19% of older adults, being socially isolated (Gilmour, 2012). Social isolation is the lack of social connections in both quantity and quality (Hawkley, et al., 2008). De Jong Gierveld and Van Tilburg (2006) define loneliness as the emotional distress an individual feels as a result of social isolation and social isolation is the major factor in causing loneliness for individuals.

SNSs are online websites that allow for communication, collaboration, and sharing of content among the various users (Boyd & Ellison, 2008). SNSs can be utilized to communicate with others in a virtual environment, by both creating new relationships and enhancing existing relationships (Kaplan & Haenlein, 2010). SNSs were found to strengthen the bonding and bridging of social capital of the participants (Antheunis, Vanden et al., 2015; Erickson, 2011). Social capital is the strength of one's ties to others and has been found to have a positive impact on the wellbeing of older adults (Mathews, et al., 2008).

As individuals age they have a higher likelihood of being socially isolated and lonely. This is due to changes in their social network and changing life circumstances (Victor et al., 2000). Changes in social networks occur due to retirement, death of friends and family, becoming a caregiver to others, along with the moving away of friends and family or from moving away of oneself (Cotten, et al., 2013). Changes in life circumstances such as financial constraints or health issues that reduce mobility can also have a negative impact on one's social life and one's functional ability (Victor et al.,2000).

1.1 Research Motivation

A great deal of literature has been produced on the concept of loneliness and social isolation. Social isolation is defined as the lack of social connections, while loneliness is the painful emotion that social isolation causes for some individuals. Measurements for both social isolation and loneliness have been constructed and tested (De Jong Gierveld & Van Tilburg, 2006; Hawthorne, 2006; Penning et al., 2014). The characteristics of individuals who are more likely to be socially isolated and suffer from loneliness have been extensively studied, producing a comprehensive body of work. The causes of social isolation and loneliness have been determined with some success as well. Social isolation and loneliness are similar yet different. For this body of research I will be focusing on the phenomena of loneliness.

For several decades, researchers and various organizations have tried to find a method for helping to reduce social isolation/loneliness for older adults and others. The findings suggest that the interventions have been successful for some but not for all of the groups participating in the studies (Blaschke et al., 2009; Damant et al., 2016). On the other hand, as computerized technology has become more accessible and user friendly, more individuals have gone on-line, including those over the age of 65. It is within this latter group (older adults), where research is beginning to focus on whether and if online relationships developed with the aid of computer technology are able to reduce loneliness.

The impact of using the Internet and SNSs has been explored in relation to both wellbeing and loneliness. Cotton et al. (2013) found that using the Internet was associated with lower levels

of loneliness. *Facebook* use has been shown to increase social capital (Ellison et al., 2007; Sum S. et al., 2008). The active updating of personal webpages on *Facebook* was found to reduce loneliness, suggesting that the passive use of SNSs might increase loneliness (Deters & Mehl, 2012). Several articles have been compiled on the effectiveness of information and communication technology (ICT), social media and SNSs on reducing loneliness for older adults. They suggest that the results have varied, from increasing loneliness, or reducing it, to having no significant effect on loneliness (Blaschke et al., 2009; Damant et al., 2016). Although some of these results have been encouraging, they have been inconclusive overall with respect to the positive impact the use of SNSs can have on loneliness, with more research needed.

Although SNSs have the capability of enhancing and extending social relationships for individuals (Boyd & Ellison, 2008), the way in which SNSs are used as a means to enable social connections and its impact on loneliness has not been studied fully. There has been research on both social capital's related impact on loneliness and whether SNSs can create or enhance an individual's social capital. Social capital theory examines the social connections and networks of individuals as an asset (Putnam, 2000). I have been able to find few if any studies on the mechanisms of the impact that SNSs have via the creation of social capital on loneliness. Neither has the link been analyzed between how the different facets of use of SNSs in creation of social capital can impact loneliness. Therefore, the underlying mechanisms of SNSs use through an individual's social capital and its resulting impact on loneliness needs to be examined further.

To date, published research on social capital and loneliness has been focusing on the influence of individual use of computers, the Internet, social media and SNSs. Thus far, this body of research has not given a definitive answer as to the effectiveness of the medium's impact on social capital or loneliness. Although research has started to examine further aspects of SNS use on both social capital and loneliness, this research has also been inconclusive. Other research has focused on the IT artifact, such as robotic pets, and its impact on social isolation/loneliness (Khosravi et al., 2016). However, the overall findings thus far are inconclusive.

The literature that pertains to older adults' utilization of information systems and more specifically social networking has addressed the demographic characteristics of the users. Other studies that have looked at social networking as a way of connecting with others has been very specific in the social network analyzed, such as *Facebook*. However, a study by Karahasonovic et al. (2008) suggested that the use of social networking can foster social relations, when examining the overall quality of life and not specific aspects of quality of life.

Previous literature on the use of SNSs has examined some different facets of the use of the medium. This includes, for example, the contact profiles of the user, and the number and relationship to the user of the online contacts (Jung & Sundar, 2016; Pollet et al., 2010). The intensity of use of the SNSs and Internet have also been examined, finding varying degrees of influence over the psychological condition being measured (Cotton et al., 2013; Neves et al., 2015; Neves et al., 2018; Vroman et al., 2015).

In this research, I intend to address the gap in the literature in several ways.

1. Utilize the ways in which individuals use SNSs in order to create a more thorough understanding of SNSs influence on social capital.
2. Inform on how the influence of social capital created online can result in direct and indirect impacts on loneliness for older adults.
3. Develop a greater understanding of the influence of SNSs for older adults on loneliness, by gathering and analyzing their personal opinions on the quantitative findings for the gap mentioned above.

1.2 Research Objectives

This study addresses the issues and gap discussed in the previous section. To fill the gap this research investigates the means by which SNSs create social capital and how this affects loneliness of older adults. To be more specific the research questions are:

1. What usage characteristics of social networking sites influence the effectiveness with which social ties are strengthened? Can the use of social networking sites strengthen social ties for older adults?

2. Can increasing social capital online reduce loneliness?

3. Do older adults perceive the value of SNSs in increasing social capital and reducing loneliness?

The objective of this research, is to examine the effect that SNSs have on creation or maintenance of social connections for the older adult population, using the underlying theory of

social capital to gain a better understanding of how SNSs can be utilized by older adults to reduce loneliness. More specifically, I will be examining the different facets of SNS use and their influence on social capital. These facets will be an extension to those used in previous research. Some of these facets, although defined in the literature, need to be formalized through the measurements used to build the constructs. While a few facets have been used for previous research, the facets examined in my study include Contact Breadth, Active Use, Public Message Content and Private Message Content. Additionally, I will be examining the influence that Social Capital has on loneliness for older adults when they build it using SNS.

The research will utilize the framework created by de Jong Gierveld et al. (2015) integrated into a model of how SNSs are used. First, the model will investigate how social networking, in general, impacts social capital created via online applications for older adults. Secondly, the model will derive an understanding of the influence that Social Capital created through SNSs has on loneliness. The framework of the model will be used to guide an empirical survey of SNS users to bring greater understanding and clarity to the research.

This research has both theoretical and practical implications. The first theoretical implication is expanding the facets of Use of SNSs to incorporate those already created and those that were created specifically for this body of research to give a more complete picture of how individuals use SNSs. Secondly, an analysis of the influence of cyber social capital has both directly and indirectly on loneliness.

The practical implications of the research will give a better understanding of how SNS use can affect loneliness within the older adult population. It will also give some guidance as to the SNS facets that should be taught or emphasized in programs designed for older adults who will be using the technology, and how they might aid in the development of SNSs for older adults. The implications are that SNSs can be viewed as interventions based on the different facets of use incorporated into existing frameworks that have examined SNSs. Additionally, the research will show that the theory of social capital can be incorporated into an environment that is social and not just business related. Finally, this research extends the use of how SNSs incorporate facets of use, thereby providing a more complete picture of how individuals interact with the online medium.

1.3 Outline of Dissertation

This thesis is organized as follows. The following chapter (chapter 2) gives a contextual view to SNSs, social capital and loneliness. Chapter 3 presents the research framework, detailing the research model and the hypothesis statements. The research methodology is discussed in Chapter 4. Chapter 5 presents the validation of the model. Chapter 6 and 7 detail the quantitative and qualitative results of the study, and Chapter 8 discusses the findings and implications also incorporating the research conclusions, along with limitations and future research.

2. Theory/Literature Review and Context

This chapter defines the underlying theoretical framework and gives a discussion of the pertinent literature on SNSs, social capital, loneliness, and social isolation. Older adult use of social networking will be defined, along with an overview of the research completed on the above topics. A summary of both social isolation and loneliness in the literature is presented, as many studies do not differentiate between the two phenomena and their definitions suggest an overlap and blurring of the two concepts.

2.1 Social Capital Theory

Social capital is the "connections among individuals - social networks and the norms of reciprocity and trustworthiness that arise from them" pg. 19 (Putnam, 2000). Social capital is a theoretical framework to examine and understand social relationships (Portes, 1998). It consists of two different concepts; bonding and bridging (Erickson, 2011). Bonding social capital (BOSC) is the social capital that facilitates the emotional connections between friends and family and is seen as a strong tie (Erickson, 2011). Bridging social capital (BRISC) is the social capital that creates ties to others outside of one's strong-tie network of close family and friends, which are known as weak ties (Erickson, 2011).

Social capital is a concept from economics, which proposes that social ties are capital assets for the individual and community they inhabit. Putnam (2000) states that social capital is derived from one's social network and the norms of reciprocity and trustworthiness within the social

network. These norms facilitate support for each other through mutual implied reciprocal agreements (Sum et al., 2008). These collectives of personal relationships and, by extension, communities are held together and enhanced by social capital (Ellison et al., 2007). Social capital is an intangible asset that individuals and the community create through interactions in the social network that exists in the community. An individual's social capital can be created and expanded over time. If not nurtured, social capital decreases as the quality and extensiveness of the individual's social network changes.

Many of the changes in life for older adults, such as changing social roles, changing living conditions etc. tend to have a negative impact on their social networks (Cotton et al., 2013; Hawthorne, 2006; Savikko et al., 2005). These life-changing circumstances tend to reduce the quality of and shrinkage of their social networks, causing a reduction in social capital.

In accordance with Coleman (1988), social capital is described by two common elements of social structures along with the action of individuals operating within the social structure, where social capital is created by both strong and weak social ties to others (Granovetter, 1973). The strength of these social ties is dependent on a combination of factors including time spent on the relationships, the emotional intensity and intimacy of the relationships and the type of reciprocal services that characterize the social ties (Granovetter, 1973).

Social capital in older adults can be reduced through the reduction of either or both strong and weak ties to others. Weakened ties are a result of interaction with others on a less personal/emotional level (For example, the colleague that we greet in the elevator every day or the

parent that we talk to at the daycare when picking up our children). These ties can give us information support or functional support such as the parents at the daycare saying that a virus is going around, or trading childcare when the children are not in daycare, respectively. Strong ties are relationships with those that an individual interacts with more frequently or on a more personal level, such as close family and friends. These ties give emotional support as well as information and reciprocal services. For example, strong ties for individuals would help when they are ill, as these types of relationships provide comfort along with care.

Social capital has been viewed as a health resource, with increased social capital being associated with better mental and physical health while lowering the risk of dementia, disability and death (Coll-Planes, 2016). Low levels of social capital were found to be an indication of poor quality of life (Nilsson et al., 2006). The level of support older adults have in the form of social connections for help in a crisis or with someone outside their family to listen to them is dependent on their level of social capital (Gray, 2009). This indicates that social capital serves as a buffer from declining health and support for quality of life, along with mechanisms for help as individuals age.

Social capital has been used to investigate the relationship between social connections and psychological concerns (de Jong Gierveld et al., 2015). Here, the higher the level of social capital the less likely older adults were found to be lonely or socially isolated. Social capital has been used as a concept to understand an individual's social connections to others, and its influence on their mental health.

Social capital has been utilized in the examination of social media and Internet usage influences on social connections. The use of Internet technology has been associated with higher social capital and wellbeing although it can also cause psychological harm to older adults, depending on how they use the Internet (Sum et al., 2008). The use of the Internet for communication and information seeking tends to be effective in increasing social capital (Sum S. et al., 2008; Wellman et al., 2001). Yet, using the Internet to find new connections and entertainment tends to influence social capital negatively (Sum S. et al., 2008; Wellman et al., 2001). This suggests that how one uses the Internet and social media can influence social capital differently.

Other studies have examined online communities and their effects on social capital. Lee and Lee (2010) found that online communities that enhance communication although social capital was not fully related to the use of the online community. Further, a study by Neves et al. (2018) found the frequency of Internet usage was a predictor of social capital and not age. Yet in the same study, they found that utilization of email, SNSs and instant messaging was not able to predict the level of social capital. This suggests that use of the Internet for social purposes may not affect the growth of social capital (Neves et al., 2018).

In a study of college students *Facebook* was found to have an impact on social capital (Ellison et al., 2007). The study found that the intensity of use of SNSs influenced social capital, where the higher the intensity of use the higher social capital became. In this study, college students that were away from home had the ability to maintain and enhance previous close relations. This

is important to bonding social capital. A study by Ellison et al. (2007) suggests that intensity of use of SNSs affects the level of social capital for an individual. *Facebook* use was also examined to understand its impact on social capital of older adults (Erickson, 2011). This study found that the use of *Facebook* was unlikely to supplement or increase either BOSC or BRISC for older adults. Studies examining individual use of *Facebook* and its impact on social capital seem to be inconclusive, as some studies found positive influences while others found no relationship.

How one uses social media and SNSs has also been found to impact social capital (Quinn, 2016). Not all types of use tend to impact social capital. If social media is used in maintenance of relationships then it will produce an outcome in relation to social capital. As Quinn (2016) states, "a greater nuance is called for when examining the effects of social media" (pg.593). This suggests that the way in which an individual uses SNSs impacts on decreasing, increasing or maintaining social capital. The medium, SNSs, can only be valuable in increasing social connections and reducing loneliness, if used effectively to maintain or increase social capital for the individual.

Wellman et al. (2001) proposed that the use of the Internet could increase social capital, with some limitations. One of them is that the more frequently used, the larger the social network. With a larger social network, individuals are exposed to distasteful communication more often. This tends to decrease the individual's commitment to the online community such that the more social connections, the higher the social capital, yet the consequence of higher social capital could lead to a reduction in social capital.

2.2 Social Networking Sites (SNSs)

SNSs are a subset of social media, with social media being defined as 'a group of Internet-based applications that build on the ideological and technological foundations of Web 2.0 and that allow the creation and exchange of user generated content' (Kaplan & Haenlein, 2010, pg61). SNSs will be defined as online sites that individuals can join by constructing a profile, creating a list of connections (which others may or may not be able to view) and have the ability to communicate with others through various methods, for example texting, posting etc. (Boyd & Ellison, 2008: Kaplan & Haelein, 2010).

Kaplan and Haelein (2010) classify the types of social media by two different criteria, social presence/media richness and self-presentation. SNS media are ranked high on both these criteria in accordance with the Kaplan and Haelein research. Boyd and Ellison (2008) state that SNSs are web-based services allowing individuals to do the following:

1. Construct a profile within the system that is either public or semi-public.
2. Create a list of other users to whom they are connected.
3. View and connect with their list of connections and others that are within the system.

Kaplan and Haelein (2010) similarly describe SNSs as online sites where users create personal profiles, with these sites enabling users to connect and invite friends to have access to their profiles and share information and electronic exchanges between users. Boyd and Ellison (2008) suggest that the unique features of SNSs are the ability of users to show their social networks, and not that individuals can connect with strangers. Beer (2008) has advocated that SNSs can be utilized for

more than just another method to connect with individuals to whom a user is already socially connected. The very term 'social networking site' suggests that the main preoccupation of using the site is to network with known and unknown individuals (Beer, 2008).

The essential features of SNSs are considered to be:

- Personal profiles
- Establishing online connections
- Participating in online groups
- Communicating through online connections
- Sharing user generated content
- Expressing opinions
- Finding information
- Keeping the users interested

(Kim et al., 2010 pg. 219)

Individuals use SNSs for various reasons such as connecting with others and finding/distributing information. To aid in understanding why individuals use SNSs, seven themes of use were hypothesised by Whiting & Williams (2013). These themes include social interaction, information seeking/sharing, passing the time, entertainment, relaxation, communication utility and convenience utility. The use of SNSs can enable users to manage large numbers of weak ties more easily, enabling easy contact and lowering the barriers to interaction among individuals

(Lampe, & Steinfield, 2009). These authors also indicate that SNSs enable coordination of various group activities efficiently and they also enable mobilization of action for various social causes.

Older adult use of social networking is dissimilar from those of other age groups, differing as the age of those in a group increases. In 2013 it was found that 74% of those between the ages of 65 and 69 are online users, decreasing to 37% in the over 80 category (Pew Research Center, 2014). This same study found that older adults with higher incomes and education levels were much more likely to go online.

As the use of computer technology has increased, there is a divide between its use by older adults and those in the younger demographic groups (Pew Research, 2017). As many organizations, businesses, government, etc. have pushed for more online inclusion, older adults tend to be ambivalent to using ICT (Information and communications Technology) (Selwyn, 2004). This ambivalence is because of lack of knowledge or irrelevance to their daily lives. Selwyn (2004) suggests that even if older adults have used ICT for work before they retired, they may still not find the medium engaging.

Of older adults who access the Internet, those who adopt tablets felt more connected and current (Tsai et al., 2015). Of groups of older adults that used SNSs to create content, it has been found that SNSs fostered social capital for the participants (Karahasonovic, et al., 2008). The fostering of social relationships has been found to decrease loneliness (de Jong Gieveld et al., 2015). It has also been found that participants who utilized social networks frequently were less

lonely, while those who rarely utilize social networking where more likely to be lonely (Vosner et al,, 2016).

When older adults use the Internet as a tool for communication, it reduces their loneliness (Sum et al., 2008). Yet, the more often the Internet is used to find new connections, higher levels of loneliness are realized (Sum et al., 2008). Internet use has been found to increase older adults' social support, and social support has a negative impact on loneliness (Heo et al., 2015). Further, the use of Internet in community care situations was found to reduce the level of loneliness of older adults (Cotton et al., 2013). A Dutch study looked at an "Internet at home intervention", which taught older adults how to use a computer (Fokkema & Knipscheer, 2007). Findings were that the participants who used the computer had a significant decrease in their level of loneliness. The use of the Internet and SNSs has been found to enable the reduction of social isolation and loneliness in several studies (Cotton et al., 2013; Fokkema &Knipscheer, 2007; Heo et al., 2015; Sum et al., 2008).

The Internet and its use has been found to impact older adult loneliness and social isolation. One study examined the number of times older adults went on line in a week in conjunction with their level of perceived social isolation and loneliness (Cotton et al., 2013). This study examined only the frequency of use, without examining other factors of use, such as the quality of the social interaction, or if there was any social interaction in the online usage by older adults.

The use of the Internet when expanding social support systems of older adults was also found to help reduce loneliness (Heo et al., 2015).

The literature reviewed suggests in general that the use of the Internet and SNSs has a positive impact on social connections and may reduce loneliness for older adults. Social capital for the body of research thus far, has only been seen in its totality and is not broken down into subcomponents, such as social capital created utilization of ICT and other computer assisted social media.

2.3 Loneliness and Social Isolation

Social isolation is defined as the absence "of companionship, social supports, or social connections" (pg.521) (Hawthorne, 2006). In contrast, loneliness is defined as the painful feeling of social isolation that accompanies perceived deficiencies in the number and/or quality of one's social relationships (Hawkley, et al., 2008). Social isolation is an objective observation that can be easily measured. On the other hand, "loneliness is synonymous with perceived social isolation, not with objective social isolation" (Hawkley & Cacioppo, 2010, pg 1). Since loneliness is a subjective concept, it is more difficult to measure as everyone feels loneliness to different degrees. As can be seen from the two different definitions, social isolation can lead to loneliness, but the individual needs to perceive that there is a lack of quality and/or quantity of relationships to feel lonely. Individuals can be socially isolated but not feel lonely, as individuals have varying needs for companionship (Burger, 1995).

Individuals vary in their preference for time spent alone (Burger, 1995). Social isolation could be defined as solitude, as the definition for solitude is referred to as the absence of social interaction (Burger, 1995). Solitude as a form of social isolation may allow individuals to develop

their more intellectual, spiritual, emotional or creative qualities (Burger, 1995). Maslow (1970) found that self-actualized people have a character trait of having a high need for privacy, or time spent alone. Solitude theory suggests that some individuals prefer solitude, which is "separate from the tendencies toward attachment, sociability, loneliness, neuroticism and social anxiety" (Detrixhe et al., 2014) pg. 312. This suggests that certain individuals require time alone and that for them social isolation is not a burden that can cause either loneliness or boredom.

Individuals vary in their need for social inclusion, so social isolation for some population members is not felt negatively. Thus, negative consequences of social isolation are felt by some individuals but not all. This research will focus on loneliness that is defined as individual perceptions of the lack of meaningful social connections that cause them emotional distress. On the other hand, for this research social isolation will be defined as a lack of quantity of social connections that an individual experiences.

Loneliness has been associated with a reduced level of well-being, increased levels of depression, higher levels of disability, and an increase in functional decline and premature death (Hawton, et al., 2011; Olsen et al., 1991; Hawkley & Cacioppo, 2010; Perissinotto et al., 2012; Pinquart & Sorensen, 2001). Loneliness or a lack of social connections affects an individual's quality of life (Farquhar, 1995; Pinquart & Sorensen, 2000). Quality of life for older adults is important for both individuals and society. Quality of life is related to the extent that individuals are satisfied or dissatisfied with various aspects of their lives (Farquhar, 1995). The individual's quality of life from a societal perspective is important as it indicates the level of health and

productivity of individuals within society. The quality of life of individuals is also an indicator of how caring and supportive society is of its members.

The issue of loneliness and how it is defined and measured has been viewed as an important variable that has been researched extensively (Bekhet et al., 2008; de Jong Gierveld & Van Tilburg, 2006; Cacioppo & Hawkley, 2009; Hughes et al., 2004; de Jong Gieveld et al., 2015). Different researchers have tried to develop or modify measurement instruments for loneliness (de Jong Gierveld & Van Tilburg, 2006; Hughes et al., 2004). The two most popular measurement instruments for loneliness are the UCLA loneliness scales (University of California, Los Angeles) and the de Jong Gierveld loneliness scales (Penning et al., 2014).

As research suggests that loneliness has an impact on the physical and psychological well-being of older adults, many different studies have looked at the causes of loneliness in this demographic (Hawthorne, 2006; Savikko et al., 2005). There are certain factors that are more prominent in lonely older adults with the most prevalent being lower income levels, lower education levels, health condition, mobility issues, and marital status (Savikko et al., 2005). A lower socioeconomic status has been associated with higher levels of loneliness and decreased quality of life (Pinquart & Sorensen, 2000). It has been suggested that being married decreases loneliness for individuals, although the findings have been mixed on this hypothesis (Dysktra & de Jong-Gierveld, 2004; Pinquart, 2003; Savikko et al., 2005). Yet, it has been found that those who have experienced divorce or widowhood tend to be lonelier than those that have not experienced these life-altering events (Dysktra & de Jong-Gierveld, 2004). As individuals increase in age, they

are more likely to be socially isolated and lonely, although this could be due to an increase in health issues and decreasing financial wellbeing (Pinquart & Sorensen, 2001; Savikko et al., 2005). Other determinants such as gender or having children was inconclusive in predicting loneliness with some studies finding they have an effect and others finding that they have no relationship with loneliness (de Jong Gieveld et al., 2015; Pinquart & Sorensen, 2000). The changing life circumstances of older adults due to retirement, death of a spouse and friends, being the main caregiver for a family member, as well as geographical distancing of friends and family or from themselves, cause changes in social connections that may increase loneliness (Savikko et al., 2005; Cotton et al., 2013). Physical changes caused by aging such as reduced mobility and reduced functional abilities that limit individuals from participating in activities outside of the home or participating in everyday life, such as self-care and hobbies, increase their risk of being lonely (Pinquart & Sorensen, 2000; Netuveli et al., 2006; Victor et al., 2000).

The characteristics of the individual's environment have been examined in the context of defining who is more likely to be socially isolated and lonely. The distinction between rural and urban settings has been studied (Heenan, 2011). The ideal rural setting is a close-knit community with many social supports and connections (Heenan, 2011). In many cases this is not the situation, with older adults having limited access to social supports and unable to interact fully in the community due to mobility, economic or social issues (Heenan, 2011). Many older adults in rural communities are more socially isolated and lonely than their urban peers (Heenan, 2011). This is due to the lack of social supports, with many relying on family to provide socializing activities. Many programs and initiatives to create more socializing opportunities have been unsuccessful, as

they have not been created through the participation of and listening to the opinions of the end users (Heenan, 2011). Those in urban settings are not immune to being socially isolated and lonely. For example, the more an older adult feels safe in a community the more likely they are to feel socially connected (Friedman et al., 2012). On the other hand the less safe their community is perceived the more likely older adults are to be socially isolated (Friedman et al., 2012). Location is seen to have an impact on loneliness for older adults; those that live in rural areas that have few social outlets and those individuals that live in urban areas that are less safe all have a higher probability of being lonely.

The literature on interventions for reducing loneliness/social isolation has two distinct categories; the first is from the social science perspective without the use of information technology (IT) and the second from the IT/IS (information technology/information systems) perspective. This is due to the two disciplines having different perspectives. IT/IS views information technology or information systems as the focus of the perspective whereas in the social sciences the perspective is focused on the human condition. Although social scientists have been examining the use of IT in many of the studies on social isolation/loneliness, their focus is still on the individual and the technology is secondary to the human condition. Research generated through studies using IT/IS and loneliness have been placed in this overview to gain a better understanding of how IT/IS has been incorporated into the study of social isolation/loneliness.

The use of computers and computerized technology has several barriers for older adults. It has been noted that computers/mobile phones may be unknown and new to older adults so the idea

of using this technology can cause anxiety (Mallenius et al., 2007). To overcome this anxiety many different programs and training classes have been created for older adults in order to reduce loneliness. It was found in one such study that after eight weeks in an app-based training course, older adults were perceived to be slightly less lonely (Chiu, et al., 2016). Although this study showed a marginal change in loneliness, this could be attributed to the course itself, or to interaction with other participants, which was not ruled out in the study. In another study a program that enabled older adults to reminisce about their past by posting videos showed that older adults are willing and able to use technology to engage and interact with other generations (Chonody & Wang, 2013). This suggests that further research is needed to understand whether these types of exercise promote and enhance connections to family and community. When examining an online community of older adults from a specific neighborhood that created user generated content, it was found that the online site created more opportunities to generate and enhance social capital (Karahasonovic, et al., 2008). Many older adults are willing to go online for various reasons to use SNSs. They create content for neighborhood associations, volunteer, search for information, play games and various other activities (Karahasonovic, et al., 2008; Khosravi et al., 2016).

Many different types of interventions have been perceived and utilized to reduce social isolation and loneliness in older adults. Low-tech options involve visiting volunteers, telephoning buddies and creating physical social sites that can accommodate different events for older adults (Anderson, 1998). These types of interventions have been helpful, although many older adults are unable or unwilling to access these resources. Some of the reasons for their unwillingness include that it is seen by the individual to have little value, as it does not fit their personality type, or the

programs have little effect on their mental state (Cattan et al., 2005; Buttler, 2006). An ethnography by Waycott et al. (2016) found several reasons why older adults discontinued participation. These reasons ranged from failing health to social reasons (such as lack of time) to inability to learn to use the technology. The many reasons for participant withdrawal from the study were not due to decreased need for social interactions but that the intervention method did not work for the individual (Waycott et al., 2016). Hence, the form of online intervention to reduce loneliness needs to be tailored to the individual.

Some forms of technology options that have been examined are email, SNSs, robotics, video games, chat rooms and general IT use (Cotton et al., 2013; Khosravi et al., 2016). Internet use was found to increase social interactions with others and reduce loneliness (Cotton et al., 2013). The use of SNSs in this manner has been inconclusive according to Khosravi et al. (2016). Robotics as an IT/IS intervention is interesting in that the studies have looked at robotic pets and a conversational agent, both of which have had promising results on lowering loneliness (Khosravi et al., 2016). The use of video games was examined in a study using Wii[1] that compared the group to those watching television. The group that used Wii had a reduction in loneliness in comparison with those watching television (Kahlbaugh et al., 2011). This suggests that interactive games may reduce loneliness in older adults.

Two articles from the IT/IS literature as an intervention medium for social isolation/ loneliness reviewed how the technology has affected social isolation (Khosravi et al., 2016; Chen

[1] A popular video game console created by *Nintendo.* It allows users to be physically interaction with the games by use of various blue tooth/infrared sports equipment (Your Dictionary, 2018).

& Schulz, 2016). Both articles found that the results of research thus far were not consistent with either social isolation or loneliness being reduced due to the use of IT/IS. Chen & Schulz (2016) conclude that further research is necessary to determine the types of IT/IS that can be used to reduce social isolation as well as identifying the types of older adults that would receive the most benefit from this type of intervention. Blaschke et al. (2009) reviewed aging and technology, suggesting that the non-conclusive results from the literature review were "due to the technology itself and how its uses varied considerably across studies" (pg. 647) making results difficult to generalize. A review of the literature suggested that IT/IS could be used to maintain social involvement and participation in personal relationships, while other research suggested just the opposite, in that use of IT/IS could reduce social involvement and reduce participation of individuals in socializing with others (Damant et al., 2016). This suggests that the literature pertaining to IT/IS impact on loneliness is inconclusive and needs to be further studied. Furthermore, the fact that inconclusive results could be due to variance in the studies of the technology themselves implies that how the technology is actually used should also be studied in more detail.

The above literature review shows that a great deal of research has been done on different interventions for social isolation and loneliness. For several decades, researchers and various organizations have tried to find a method for helping reduce social isolation/loneliness for older adults and others within the population. The findings suggest that the interventions have been successful for some but not all. As computerized technology has become more accessible and user friendly, more individuals have gone on-line, including those over the age of 65, which the research has begun to focus on how and if computer technology is able to reduce loneliness.

The literature that pertains to older adults utilizing information systems and more specifically social networking has been addressing the demographic characteristics of the user. Other studies that have looked at social networking as a way of connecting with others has been very specific in the social networking analyzed, such as Facebook. The study by Karahasonovic et al. (2008) that suggested that use of social networking can foster social relations looked more at the overall quality of life and not specific aspects of quality of life. This research further extends the examination of the ways in which older adults utilize SNSs to influence social relations in aid of reducing loneliness.

3. Research Model and Hypothesis Development

The objective of this research is to examine the impact that the use of SNSs has on social connections among the older adult population, along with the impact that increasing social connections via the use of SNSs can have on loneliness. To achieve this objective the first goal was to extend the de Jong Gierveld et al. (2015) model through the addition of SNS facet usage (See Figure 3.1). To realize an understanding of how SNSs aid in creating and enhancing social connections, this model hypothesizes the different characteristics of using SNSs that can influence Social Capital. The second goal of the research was to examine the influence of Social Capital on reducing loneliness, modeling the Social Capital specifically created through use of SNSs. The inclusion of Perceived Health Status, Perceived Financial Wellbeing and Satisfaction with Relationships (offline) were included in the model, as the literature has determined that these constructs tend to have an influence on Loneliness. An overview of the hypothesis statements is given in Table 3.1.

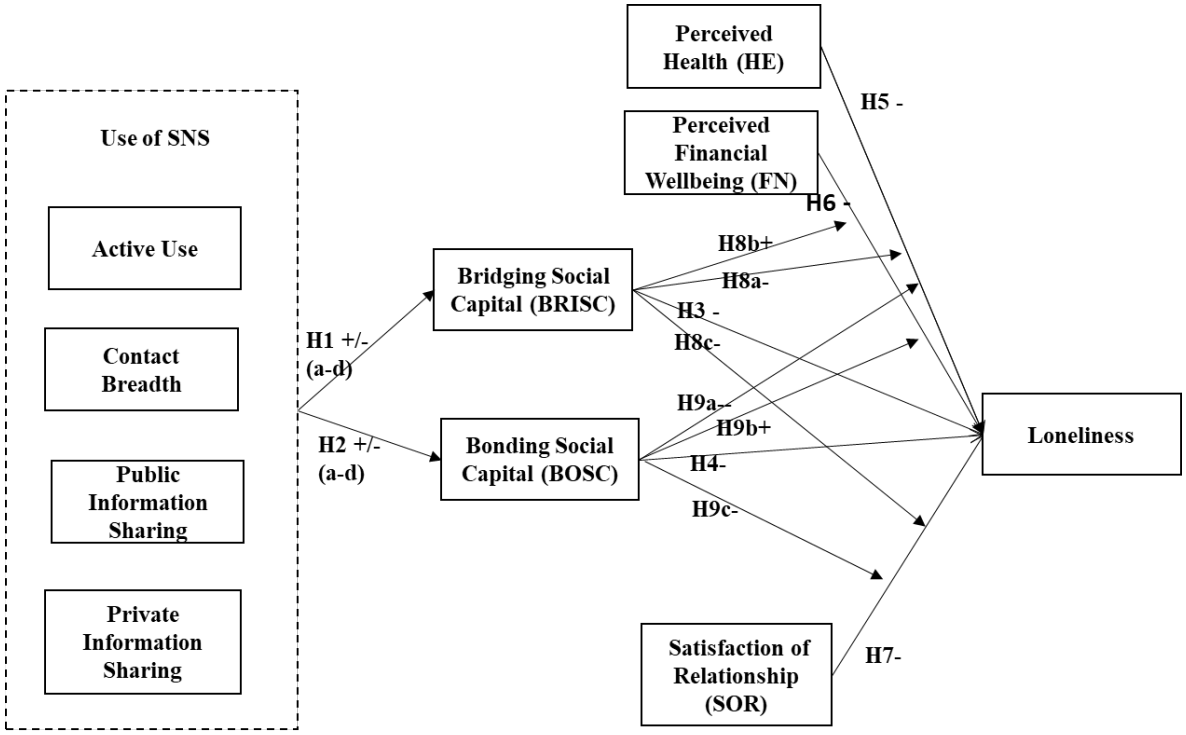


Figure 3.1: The Model

Table 3.1: Hypothesis Statements

Hypothesis	
H1	The use of SNSs will positively influence BRISC online.
H2	The use of SNSs will positively influence BOSC online.
H1a	Active Use of SNSs will positively influence BRISC.
H2a	Active Use of SNSs will positively influence BOSC.
H1b	A broad breadth of contacts will positively influence BRISC.
H2b	A broad breadth of contacts will negatively influence BOSC.
H1c	Sharing public information in communication using SNSs will positively influence BRISC.
H2c	Sharing public information in communication using SNSs will positively influence BOSC.
H1d	Sharing private information in communication using SNSs will negatively influence BRISC.
H2d	Sharing private information in communication using SNSs will positively influence BOSC.
H3	An increase in BRISC will negatively influence loneliness.
H4	An increase in BOSC will negatively influence loneliness.
H5	Perceived positive health status will negatively influence loneliness.
H6	Perceived positive financial wellbeing will negatively influence loneliness.
H7	Satisfaction of relationships offline will negatively influence loneliness.
H8a	BRISC negatively moderates (weakens) the relationship between perceived health status and loneliness.
H8b	BRISC will positively moderate (strengthen) the relationship between financial wellbeing and loneliness.
H8c	BRISC will negatively moderate (weaken) the relationship between satisfaction with relationships offline and loneliness.
H9a	BOSC negatively, moderates (weaken) the relationship between perceived health status and loneliness.
H9b	BOSC will positively moderate (strengthen) the relationship between financial wellbeing and loneliness.
H9c	BOSC will negatively moderate (weaken) the relationship between satisfaction with relationships offline and loneliness.

3.1 Use of Social Networking Sites

SNSs are web-based sites that allow individuals to interact with others (Boyd & Ellison, 2008). There are two functions of SNSs. The first is to maintain and enhance communication with an already established social network (Ellison et al., 2007). Secondly, SNSs facilitate connections between individuals that would not have been created in other circumstances (Ellison et al., 2007). As SNSs enable individuals to maintain, enhance and form relationships, they will have a positive impact on social capital. This ability to use SNSs to interact with others allows users to generate online social capital or cyber social capital; this online social capital is strongly correlated to individual levels of offline social capital (Mochen & Xunhua , 2013). As such, individuals using SNSs can enhance and extend their social capital (Mochen & Xunhua, 2013). Online BRISC would create weak ties to others that would be used for informational purposes (Wellman et al., 2001). For example, an individual can use an SNS that pertains to a certain hobby, with the members of this site exchanging tips and other forms of information that pertain to the hobby. Another example of individuals using SNSs to enhance or extend BRISC are sites that allow former classmates to interact and catch up on each other's lives. These examples highlight how SNSs can influence online BRISC in a positive way. Online BOSC can be created and enhanced through the sharing of more personal or emotional information through SNSs (Wellman et al., 2001). Many families and close friends form small private groups within SNSs, for the sharing of content allowing personal/emotional information to flow privately among the members (Smock et al., 2011). Small intimate groups have the ability to give emotional support to group members when face-to-face communication is not possible. An online group allows members to check in on each other when

they are not able to connect in real life, consequently enabling members to enhance or extend BOSC via SNSs.

Previous research has examined what factors cause or increase use of a website (Agarwal & Venkatesh, 2002; Venkatesh & Ramesh, 2006). The factors that influence website usage are content, ease of use, promotion, and user ability to customize the site to their requirements and emotion (Venkatesh & Ramesh, 2006). These factors are relevant in the context of adoption but become irrelevant in the examination of how the use of SNSs influences individuals psychologically.

Whiting and Williams (2013) employed uses and gratification theory to examine how social capital was impacted when individuals used social media. They found 10 different uses and gratifications when individuals use social media, including: social interaction, information seeking, passing time, entertainment, relaxation, communicatory utility, expression of opinions, convenience utility, information sharing and surveillance. Thus, uses and gratification theory can help to explain why individuals use SNSs.

As this study is focused on how SNSs influence social connections of older adults, it needs to explain the way in which they interact with SNSs. Older adults tend to use SNSs less frequently than other age groups and they are less inclined to actually use the medium. Therefore, there is a need to understand not only the motivation of the user but also how older adults use SNSs. Quinn (2016) suggested that the effect that SNSs have on social capital is influenced by the way in which it is utilized.

Previous research explained why an individual uses SNSs and what factors impact a user's adoption of the medium. Yet this does not explain how individuals use them and the impact that use has on an individual's social capital and psychological state. To clarify how the use of SNSs affects individual social capital it is necessary to examine how individuals use and interact with SNSs.

SNSs allow users to do numerous things, such as play games, blog, respond to posts from others, and read what others have posted (Ridings et al., 2006). The ways in which individuals use SNSs are varied and the number of contacts and amount of time individuals spend on SNSs differs among users. The way in which users of SNSs interact with the media also differs, such as how often they interact with others in comparison with playing games and viewing others posts. To clarify how individual utilize SNS and their influence on social capital, the Use of SNSs has been broken down into several sub-components. These sub-components have been defined by how individuals use SNSs. Using the essential features of SNSs as outlined by Kim et al. (2010) and seven themes of use for SNSs proposed by Whiting & William (2013). Whiting & Williams (2013) suggest that there are nine reasons for social media use: social interaction, information seeking, pass time, entertainment, relaxation, express opinions, communicatory utility, convenience utility and information sharing. Their study suggests that individuals use the medium for both active and passive uses as well as several different forms of communication. Whereas, the essential features of SNSs is the establishment of online connections, participation and communication with others online, sharing user-generated content (for example pictures, video or text) and information (Kim et al., 2010). I have created components of use of SNSs. These sub components are, Active Use,

Contact Breadth, and the two forms of Message Content: Public Information Sharing and Private Information Sharing. The facets of use of SNSs, have been supported by the literature, yet the construct measures for each have not been defined. For this body of research I have defined measurements for the several of the sub components of Use of SNSs. This will be further discussed in chapter four.

3.1.1 Active Use: SNSs are used for social interaction, entertainment, information seeking and passing the time (Whiting & Williams, 2013). These uses of SNSs can be categorized as either active interaction or passive consumption/use (Burke et al., 2010). Active Use of SNSs includes posting, broadcasting and direct communication with others, which allow for social exchange between the users (Burke et al., 2010; Ridings,et al., 2006). Morrison et al. (2013) defined individuals that actively used SNSs as either posters or networkers. Burke et al., (2010) characterized the interaction with SNSs as either consumption or directed communication. Directed communication is the interaction between two individuals within the SNS (Burke et al., 2010). The more active the uses of SNSs are through interactions with others online, the more likely that social connections will be either created or maintained (Burke et al., 2010; Rau et al., 2008). This creation or maintenance of social connections affects an individual's social capital positively.

Broadcasting is a one-way communication that can be sent to numerous individuals at a particular time. The function of broadcasting is to disseminate information to a group or network of individuals, such as posting holiday letters or status updates (Burke & Kruat, 2014). On SNSs, individuals have the ability to broadcast messages in the form of posts, blogs, updating of their

status, or pictures and videos for others to consume (Osatuyi, 2013). Deters and Mehl (2012) found that the mere act of updating one's status frequently fostered a sense of social inclusion for the individual. This suggests that even one-way communication can increase a person's feeling of inclusion within the group, which may increase their perception of their social capital. As broadcasting is a form of information sharing, this would affect the bridging component of social capital. Thus, the broadcasting of messages via SNSs will have a positive impact on BRISC. Direct communication enables users to share information with each other and may also enhance the weak tie relationship. Broadcasting and direct communication will therefore positively influence BRISC. Thus, the following hypothesis is proposed.

H1a: *Active use of SNSs will positively influence BRISC.*

Active use in the form of direct communication with others is a two-way communication between individuals. Direct communication can be used for both sharing information and connecting with close friends and family (Burke & Kruat, 2014). Direct communication can aid in strengthening the ties between individuals (Burke & Kruat, 2014). Hence, direct communication would have a positive impact on BOSC, leading to the following hypothesis.

H2a: *Active use of SNSs will positively influence BOSC.*

3.1.2 Contact Breadth: Contact breadth is the range and variety of individuals that a person is connected to through SNSs. The number and type of connections an individual has can be very broad, including acquaintances, to also further include the contacts of those acquaintances as well: on the other hand, their connections can be very narrow, including only close friends and relatives.

The number of contacts in an individual's social network that are via SNSs is an indicator of the types of connections they have. Individuals that have a limited number of connections tend to use SNSs to connect and keep up to date with close friends and family (Burke et al., 2010). In this case, for older adults SNSs are used to help strengthen or maintain the ties. The use of SNSs enable users to increase their social connections (Brandtzaeg & Heim, 2009). On the other hand, individuals that have a large and broad number of connections use SNSs as a way of connecting with others that they would not have been able to otherwise, due to logistics or not being members of the same offline social networks. The number of groups an individual belongs to is an indication of a broad social network. This broad social network tends to enhance and extend BRISC for the individual. Thus, the following hypothesis is proposed.

H1b: *A broad breadth of contacts will positively influence BRISC.*

A narrow or small number of connections indicates that individuals are using the medium to connect with those emotionally close to them, suggesting that use of SNSs tends to extend and enhance their BOSC. The indication is that the broader the Contact breadth is for the user the less influence it will have on BOSC. Thus, the following hypothesis is proposed.

H2b: *A broad breadth of contacts will negatively influence BOSC.*

3.1.3 Message Content: Message content examines the intimacy level of the messages that an individual sends to others. Intimacy level refers to the type of message exchanged as being either publicly or privately shared.

In many SNSs, such as *Facebook,* the user has the capability to post information to specific users or groups, thus determining how privately or publicly the message is to be directed (Lipford et al., 2008). These privacy settings allow users to project different information to the different individuals and groups to whom they are connected through SNSs (Kim et al., 2010). Individual users can determine the level of privacy wanted for each post they create.

The more private or personal the content, the more likely an individual will be to post only to those strong ties they have. This is similar to what would be done in other forms of communication within one's close social network. On the other hand, the informational or less personal posts an individual creates would tend to be public or semi-public.

Individuals post to SNSs in hopes of engaging with others. It is important for individuals to not only create content on SNSs and have others consume it, but for other individuals to take the time to reply to it (Vitak et al., 2011). Individuals produce content with the goal of fostering social interaction with others (Smocket al., 2011). The difference in the message content by the poster would suggest the strength of the social tie to the recipient. BRISC theoretically, is utilized for information and new resources (Williams, 2006). In contrast, BOSC provides emotional and functional support (Williams, 2006). Thus, suggesting the content of a public information post indicates a communication to the individual's weak ties within their social network, thus having an impact on BRISC.

The level of private and/or emotional content in posts suggests different types of relationships to an individual. Family and close friends will have more content that is private in the communication (Bazarova, 2012). Public information is more likely to be communicated with

friends and acquaintances as well as close friends and family (Kramer et al., 2014). Public information in communication between friends increases BRISC (de Jong Gierveld et al., 2015). Thus, the following hypothesis is proposed.

H1c: *Sharing public information in communication using SNSs positively influences BRISC.*

Strong ties tend to convey information that may be perceived as redundant as the relationships tend to share information and knowledge, which becomes part of the group knowledge base (Portes, 1998). This group knowledge needs to be supported with new information, least it become stagnant. It has been suggested that obligatory contacts and non-personal public information communication with family members leads to increasing BOSC (Vitak et al., 2011). Thus, the following hypothesis is proposed.

H2c: *Sharing public information in communication using SNSs positively influences BOSC.*

The level of intimacy within an online message was found to be predictive of the tie strength between individuals (Gilbert & Karahalios, 2009). Gilbert and Karhalios (2009), suggests that the more intimate the message the stronger the tie between the individuals. Yet, Bazarova (2012) suggests that the more personal/emotional (private) the message content is, the less appropriate the message is to those not close to the individual, thus having a negative influence on social connections and a reduction in BRISC. This suggests that the level of intimacy of the message can increase the tie strength, but if one of the parties views the relationship as a weak tie the

personal/emotional content of the message can push the other away. Which reduces the relationship strength. Thus, the following hypothesis is proposed.

H1d: *Sharing private information in communication using SNSs will negatively influence BRISC.*

As Granovetter (1973), stated emotional intensity and intimacy characterize the level of tie strength. With higher levels of emotional intensity and intimacy being characteristics of strong ties or BOSC. Thus, the more private/emotional content of posts and communications indicates a strong tie between individuals, suggesting that the more private a post is deemed to be, the greater the impact on BOSC.

H2d: *Sharing private information in communication using SNSs will positively influence BOSC.*

3.2 Social Capital

Social capital in the model appears in the form of two distinct constructs, BOSC and BRISC. This helps to explain the influence on loneliness of older adults that social connections have as they are enhanced or extended by using SNSs. Here social capital only refers to the social capital created using SNSs, since I am examining the cyber connection and not the satisfaction with relationships in the physical world. Social capital is comprised of both strong and weak ties (Coleman, 1988). Loneliness in older adults is reduced for those that have frequent social contact with their family and close friends (de Jong Gieveld et al., 2015). In addition, de Jong Gierveld et al. (2015) found that contact with friends had more of a negative influence on loneliness than

infrequent contact with family. Furthermore, it has been found that the more ties, both strong and weak, that an individual has, the less likely they are to be lonely (Pinquart & Sorensen, 2001). This suggests that both BOSC and BRISC can reduce loneliness for older adults. Thus, the following hypotheses are proposed.

H3: *An increase in BRISC will negatively influence loneliness.*

H4: *An increase in BOSC will negatively influence loneliness.*

3.2.1 Moderating Effects of Social Capital: In the model for this thesis shown in Figure 3.1, the relationships between the constructs of perceived health status, perceived financial wellbeing, satisfaction with relationships and social capital have all been utilized to examine their influence on loneliness in older adults as hypothesized in H3 and H4. These constructs have been found to have an influence over loneliness along with social capital (Dysktra & de Jong-Gierveld, 2004; de Jong Gierveld, Keating, & Fast, 2015). Dysktra & de Jong-Gierveld (2004) suggest that these constructs can interact with each other in a way that manifests their individual influence on loneliness of older adults. Therefore, the hypothesized relationships between perceived health status, perceived financial wellbeing and satisfaction with relationships offline that influence loneliness of older adults may be moderated by their social capital.

Reduced health and functional status tend to limit one's ability to keep up with social contacts, which increases feelings of loneliness (Savikko et al., 2005). An individual's poor mental and/or physical health reduces their ability to interact and socialize with others face-to-face (de Jong Gierveld et al., 2015), which can be a contributing factor to loneliness. As health declines,

one's ability to keep socially active and connected also declines (Savikko et al., 2005). With a decline in social activity in one's life, social capital will also be reduced, as the individual is unable to maintain and nurture social connections. The decline in health will thus reduce real life social capital and increase loneliness for the individual. Yet, those individuals that are connected online and have been able to enhance and extend their social capital in this manner may not be as adversely affected. They may find that increasing social capital online will act as a buffer for the impact of poor health on loneliness. This suggests that an increase in social capital by using SNSs may weaken the influence the hypothesized relationship between health and social capital. Thus, the following hypotheses are proposed.

H8a: *BRISC negatively moderates (weakens) the relationship between perceived health status and loneliness.*

H9a: BOSC *negatively moderates (weakens) the relationship between perceived health status and loneliness.*

Perceived financial wellbeing of older adults tends to impact on their participation rates in social activities (Savikko et al., 2005). The less financially well off an older adult is, the less activities he/she will be able to participate in, which will increase loneliness (de Jong Gierveld et al., 2015). The increase in social capital using SNSs may also increase an individual's awareness of deficits in their lives due to financial constraints. Individuals have a better ability to compare their financial circumstances to others when they are online (Appel et al., 2016). SNSs ability to enable the user to compare one's life has been found to cause envy for those whose life seems

better (Appel et al., 2016). For example, individuals may notice that they are not able to afford to travel to see their children and grandchildren or are not able to afford to go out with friends and family often. This may cause them more angst regarding their financial position and intensify the feelings of loneliness (Appel et al. 2016). Yet, those individuals that are comparing themselves to others that are not as well off as themselves may feel an increase in their feelings of self-worth (Vogel et al., 2014). These increased feelings of self-worth may reduce feelings of loneliness for individuals. Therefore, increasing social capital through SNSs may strengthen the influence of finances on loneliness for older adults. Thus, the following hypotheses is proposed.

H8b: *BRISC will positively moderate (strengthen) the relationship between perceived financial wellbeing and loneliness*.

H9b: BOSC *will positively moderate (strengthen) the relationship between perceived financial wellbeing and loneliness.*

The quality of friendships and social connections has been found to reduce loneliness (Victor et al., 2000). Thus, the satisfaction of older adults with their offline relationships reduces loneliness. Individuals that are not satisfied with their relationships tend to have an increase in their level of loneliness (Victor et al., 2000). Since SNSs can enhance and increase online social capital, they can increase an individual's total social capital. The use of SNSs can therefore be used as a supplement for the weaknesses in physical relationships (Wellman et al., 2001). An increase in satisfaction with social relationships offline through the positive effect of SNS usage could bring a greater reduction in loneliness for older adults. The increase in social capital from using SNSs

should therefore weaken the influence of satisfaction with relationships offline on loneliness. Thus, the following hypotheses are proposed.

H8c: *BRISC will negatively moderate (weaken) the relationship between satisfaction with relationships offline and loneliness.*

H9c: *BOSC will negatively (weaken) moderate the relationship between satisfaction with relationships offline and loneliness.*

3.3 Loneliness

Loneliness is the perceived lack of social contacts, with either close friends and family or acquaintances (Farquhar, 1995). It has been proposed that there are four elements to the experience of loneliness: self-alienation, interpersonal isolation, distressed reactions and agony (Rokach, 1988). As older adults age, their lives change in many ways, including decreases in work and family commitments and declining health. Many such life changes can increase older adults' likelihood of feeling lonely. These life changes can be related to two of the four elements (self-alienation and interpersonal isolation) in the experience of loneliness.

Self-alienation is defined as the "feeling of inner void, a detachment from one's self and an alienation from one's core and identity" (pg. 534) (Rokach, 1988). This definition suggests that as older adults find their personal status and titles changing, such as from wife to widow or from employed to retired, a consequence can be feelings of emptiness. The self-alienation element of loneliness tends to be beyond older adults control in different circumstances, such as health and financial situation. These are both beyond their immediate control and reduced health and financial

wellbeing that tend to increase loneliness for older adults (de Jong Gierveld et al., 2015). Conversely, better health and financial wellbeing of older adults tend to reduce their levels of loneliness (de Jong Gierveld et al., 2015).

Interpersonal isolation is the lack of social connections by the individual. This differs from self-alienation, which is the loss of one's self identify. Interpersonal isolation is comprised of three separate factors according to Rokach (1988). These factors are an absence of intimacy, perceived social alienation and abandonment. All these factors suggest a lack of social connections in the form of close friends, family and acquaintances. These types of social connections can be viewed as part of the social capital of the individual. When individuals perceive interpersonal isolation, they also perceive that they lack social capital.

Loneliness of older adults is comprised of four elements (as mentioned earlier: self-alienation, interpersonal isolation, distressed reactions and agony). I will be examining only two of these elements of loneliness in the research model I adopted, distressed reaction and agony. This is in order to understand if the use of SNSs can enhance and extend social connections of the older adult and by extension reduce loneliness. The two elements of loneliness, self-alienation and interpersonal isolation, are not examined here. Research discussed at the beginning of this chapter also examines the influence that both health and financial wellbeing have on loneliness for older adults. This also includes personal satisfaction with offline relationships and the extension and enhancements of social connections, leading to increased social capital, via the use of SNSs.

Hypothesis statements concerning the influence of Perceived Health Status, Perceived Financial Wellbeing and Satisfaction with offline Relationships are discussed below.

3.3.1 Perceived Health Status: Perceived health status is defined as an individual's perception of their health. It is a subjective construct in that it reflects how older individuals perceive their health and its impacts on their daily lives. Health and wellbeing of older adults have been shown to have an impact on loneliness (de Jong Gievreld et al., 2015). A decline in one's health, both mentally and physically, has been found to increase an individual's loneliness (de Jong Gierveld et al., 2015). This is due to poor health decreasing one's ability to engage in activities outside the home by decreasing mobility or time available for socializing. Health and loneliness have a reciprocal relationship in that poor health increases loneliness, while loneliness negatively affects health of older adults (de Jong Gierveld et al., 2015; Lauder et al., 2006; Longman et al., 2013). Longeman et al. (2013) suggest that this relationship is circular in that reduced health increases loneliness and increased loneliness reduces health for the individual. Thus, the longer an individual's health is poor and affecting their ability to socialize, the more lonely they will be over time.

Not all health conditions affect older adults equally, with some older adults being more negatively impacted by their decline in health. To illustrate I will compare two different individuals with differing health issues. The first has severe mobility issues (I will call him Sam) that limit his ability to walk, such that he uses a walker. Sam has always been very social, enjoying the company of others. Sam's mobility issue does not negatively modify his ability to socialize as many of his

friends will drop-in to visit and they also drive him to other social events. Sam's perception of his health is that, even though his mobility challenges his health it has little impact on his life. Sam's mobility issues have not reduced his social connection with others and therefore has not increased levels of loneliness for him. Such that Sam perceives his health status as fair and has little to no impact on reducing his social connections or increasing feelings of loneliness for him.

The second individual (Ruth) has arthritis in the knee, a less severe health issue. Yet, Ruth's knee pain impacts her life in a way that reduces her enjoyment of life. Prior to being affected by this health issue, Ruth was very independent, took the bus or walked to most places she wished to be. But the arthritis in her knee has now sidelined her from the activities she once enjoyed. As Ruth has been sidelined from her activities, her social connections have been reduced. Which can increase feelings of loneliness.

If I asked Sam and Ruth if they were healthy, Sam would probably say that, from his perspective, his mobility issue has not reduced his quality of life, although it may be an inconvenience. In comparison, Ruth might view herself as unhealthy since her health condition has limited her activities and reduced her quality of life. From this illustration, it can be proposed that although some individual's health is poor the impact on their life is negligible and their perceptions of their health may be good. At the same time another individual could be in far better health, yet since their health condition has a negative influence on their quality of life, it causes them to perceive they are in poor health. This perception of poor health is an indicator that an individuals quality of life is being impacted, with increased loneliness and reduced social connections being

aspects of quality of life. As declining health tends to increase loneliness for older adults (de Jong Gierveld et al., 2015), the impact of perceived health status of the individual will influence loneliness in the same manner.

Based on this discussion, older adults perception of their health can be used to predict loneliness. Thus, the following hypothesis is proposed.

H5a: *Perceived positive health will negatively influence loneliness.*

3.3.4 Perceived Financial Wellbeing: Perceived Financial Wellbeing is defined as the degree of satisfaction with one's financial situation. The amount of financial resources an individual has impacts loneliness. A higher level of financial wellbeing is associated with lower incidents of loneliness (Hawkley, et al., 2008). Thus, the better off an individual is financially the less likely they are to be lonely (Hawkley, et al., 2008). The financial level of individuals is tempered by other factors affecting loneliness in older adults, such as comparisons with their peers (Hawkley et al., 2011). Although socioeconomic factors and financial status have been shown to be indicators of loneliness, the individual's perception of those factors is a better indicator of loneliness. Perceived financial wellbeing implies that individuals compare themselves to their peers and they will view themselves as either being financially well off or doing poorly. If an individual views all their peers going on exotic vacations, and they are unable to afford a vacation or one as extravagant as their friends, they will view themselves as having poor wellbeing financially. Yet, these same individuals may be deemed financially well off in comparison with the general population. Other individuals may be deemed to be less financially well off than the general

population, but feel that they are financially well off. That is, as they are able to afford to live in a safe place and have their needs met, which may not be the case for some of their friends. The critical point is that an individual's perception of financial wellbeing may impact their feelings more than the amount of money they have. Hence, the higher the level of financial wellbeing an individual perceives the less likely they are to be lonely. This leads to the following hypothesis.

H6: *Perceived positive financial wellbeing will negatively influence loneliness.*

3.3.3 Satisfaction with Offline Relationships (SOR): Satisfaction of relationships offline is the individual's satisfaction with their social connections in both quantity and quality in the real world (Hawkley et al., 2008). A powerful predictor of loneliness is the unfulfilled expectations of contact with family and friends (Routasalo et al., 2006). In this same study, it was also noted that having family and close friends that understood them reduced loneliness for older adults. Individuals that have relationships that are satisfactory to them in both contact and quality have been shown to have less loneliness than individuals who do not have such relationships. Further, the quality of the relationship is more influential for the older adult's satisfaction and reduction of loneliness, than the number of social connections or frequency of interaction (Hawkley, et al., 2008). De Jong Gierveld et al. (2015) found that the more satisfied older adults were with communication via their social connections the less lonely they were. Research I examined has found in general that real world relationships of individuals that are satisfactory have been found to reduce loneliness. Thus, the following hypothesis is proposed.

H7: *Satisfaction with relationships offline will negatively influence loneliness.*

4. Research Methodology and Data Collection

This chapter provides an overview of the field survey of older adults conducted to facilitate the empirical test of the hypotheses in the proposed research model. It is organized into two parts. Section 4.1 describes participant recruitment, including an overview of participant characteristics. Section 4.2 presents the details of the measurement instruments utilized for the research questionnaire.

4.1 Participant Recruitment and Data Collection

Participant recruitment was done through various avenues during the different stages of the research. Online surveys were utilized, as they have several advantages in comparison with paper-based mail surveys. This included reduced time and cost, and increased geographical range (Bhattacherjee, 2001a). A further reason for utilizing an online format is the ability to screen individuals that are not using computers and would therefore not be able to use SNSs.

The target audience for the survey was Canadian adults over the age of 65 that are using SNSs. The survey was a cross-sectional analysis of older adults that gives an understanding of their opinions at a specific point in time.

Pilot study recruitment was done through personal contact, primarily from the local community surrounding McMaster University. The pilot study consisted of 29 survey completions, of which 25 were usable. 13 females, 3 males and 9 individuals who did not indicate their gender participated in the pilot study. The marital status of the study participants is 52 % married, 26%

widowed, 13% divorced and 9% living common-law. The level of self-assessed computer proficiency of the participants was 26% beginners, 61% competent and a further 17% proficient. None of the participants felt that they were expert computer users.

The pilot survey was conducted to ensure that the indicators used for construct measurement actually defined them. Some of the constructs defined in the literature tend to use similar measures. Thus, during the pilot phase the constructs were carefully assessed to ensure that their measures did not overlap other constructs. At this time, more indicators were added to improve contact breadth, which will be discussed further in the instrument construction section. Several open-ended qualitative questions were also included to gain a better understanding of participant opinions on the use of SNSs and their impact on loneliness, along with their reasons for adopting and using SNSs.

The full-scale survey was developed and administered through the online Qualtrics system (https://www.qualtrics.com/). The survey was conducted in late October 2017. It consisted of 383 participants, with 330 responses being usable. For the results of the survey to be reliable, a minimum sample size of 130 participants (at least 10 times the number of items in the most complex construct - Contact Breadth with 13 items) (See Table 2), was the minimum required (Gefen et al., 2000).

4.1.1 Demographics

For a better understanding of the survey population, specific demographic characteristics were collected, such as gender, marital status, age, education, occupation (if currently employed)

or retired, and their living situation (living alone, with family or extended family or living in a long-term care facility). The survey sample consisted of 330 Canadians over the age of 65 that were SNS users. Not all demographic questions were answered by the participants so totals for the survey participants do not add up to 330 for each demographic characteristic in the analysis of the participants described in the following. Analysis of certain demographic characteristics and their effect on loneliness will be discussed in Chapter 6, Analysis of Quantitative Data.

Gender: Males comprised only 30% of the sample, with females at 70%. These percentages are skewed in comparison with the general population of older adults. This could be an indication that women are more willing to use different forms of communication than men, are or that women were more willing to participate in the survey. The total population of Canadians over the age of 65 was almost 6.2 million in 2017 (Statistics Canada, 2017). Males in this population account for 45.6%, and females 54.4%.

Age: The sample is highly skewed to those in the 65 to 74 age bracket with 83% of those surveyed being 65 to 74, 15% 75 to 84, and 2% over 85 (See Figure 4.1). As the population ages those turning 65 are more likely to utilize the Internet than older people, suggesting as these data do that the younger demographic of older adults are more likely to be using the Internet. A 2013 study that examined Internet-based activity found that 22.6% of those aged 55 to 64 used the Internet in the previous month, 9.3% of those aged 65-74 and 3.8% of those over 75 (Allen, 2013). This helps to explain the difference in utilization among the age groups within the sample. As well, older individuals that have been utilizing the Internet may have stopped due to financial or health

issues. Thus, the smaller segment at older ages of those using social networking sites may be the norm. As the Canadian population ages, the expectation is that more of those within the older population will continue to use the Internet along with both social media and SNSs as they already do at their current younger age.

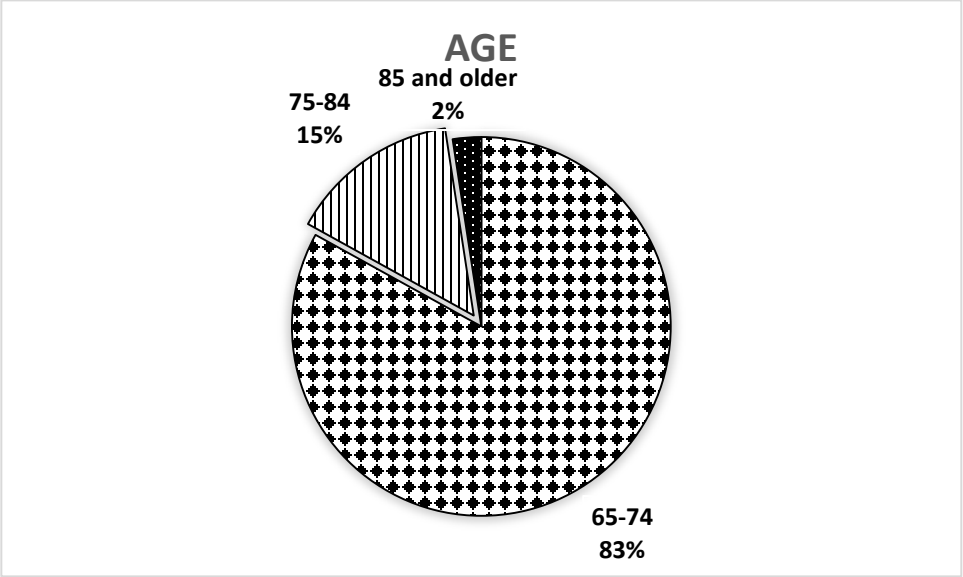


Figure 4.1: Participant Age

Marital Status: Marital status has been found to be an indicator of loneliness. Those that are widowed or divorced tend to be lonelier than those that are married or have never been married (Dysktra & de Jong-Gierveld, 2004). In my study, participants that were married or living common-law accounted for 50% of the sample (See Figure 4.2). Those individuals that were divorced slightly outnumbered those that had been widowed, yet this group when combined with those separated comprised 43% of the sample. The remaining proportion of the sample were single.

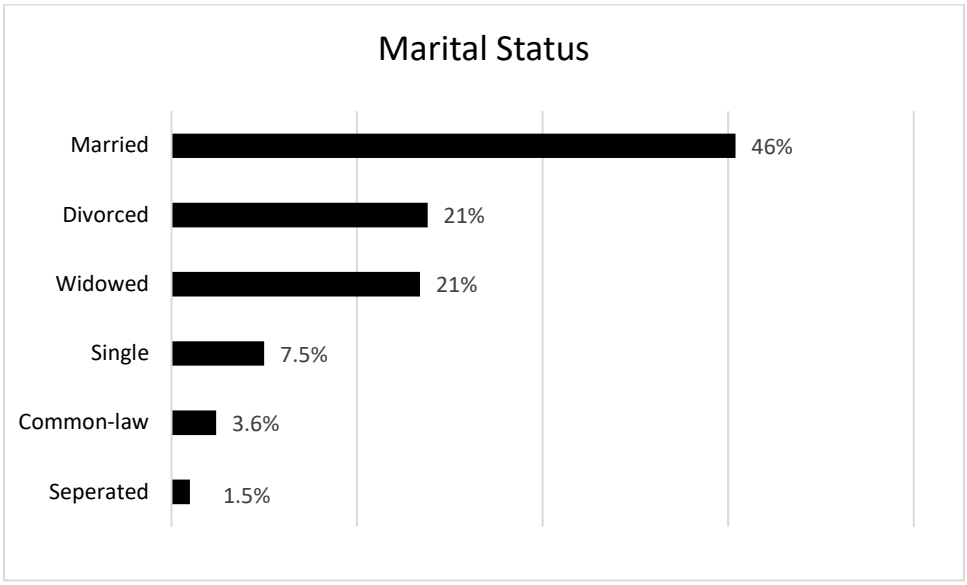


Figure 4.2: Participant Marital Status

Education: The education level of individuals might reveal any notable relations between education levels and its influence on use of SNSs (Figure 4.3). The sample was well educated with 212 (64%) having either a university or college education. The other 118 (36%) had a high school education.

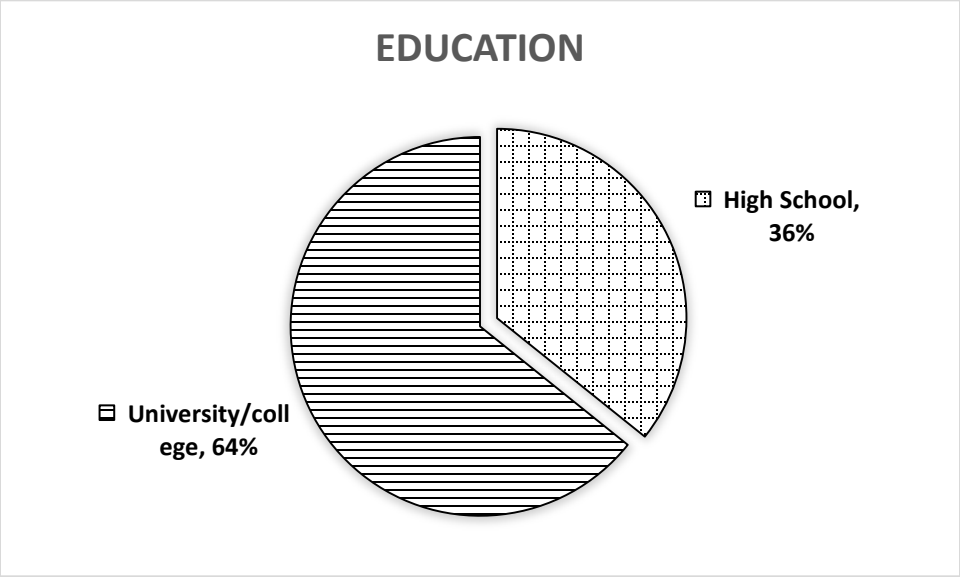


Figure 4.3: Participant Education

Living Situation: The living situation of the participants could aid in understanding if living alone or with others impacted on loneliness. The living situation also aided in understanding if those within the participant population were living in the community or if they were living in a long-term care residence. None of the participants lived in a long-term care residence with most living either alone or with others (Figure 4.4). The majority of the participants 57% lived with those they deemed immediate family, which could include partners, spouses and other close relatives.

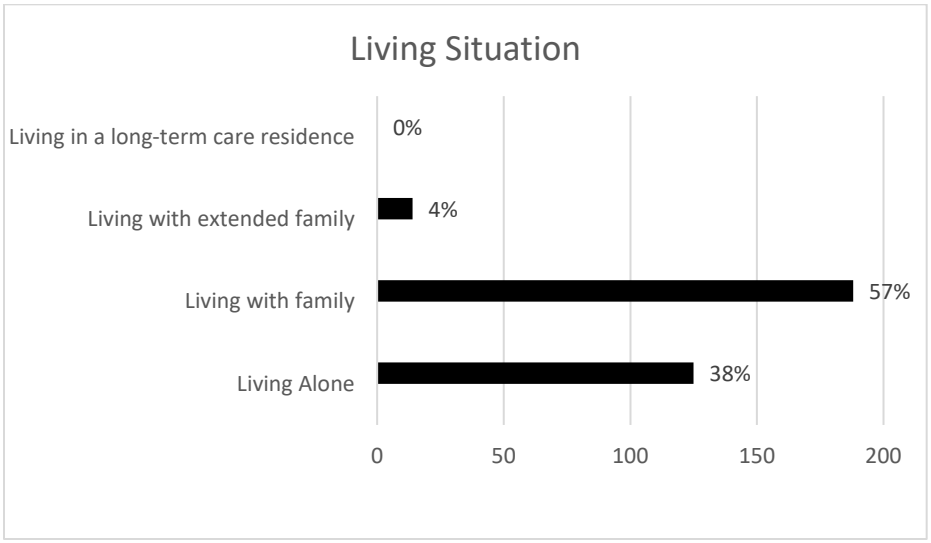


Figure 4.4: Participant Living Situation

Occupation: Different types of occupations tend to be more computer focused, so occupation may affect experience or lack of experience with computers and computerized devices. One would expect that those employed in office/administrative/management positions, healthcare and education to be more technologically well informed than other occupations. An overview of the different occupational backgrounds is given in Figure 4.5.

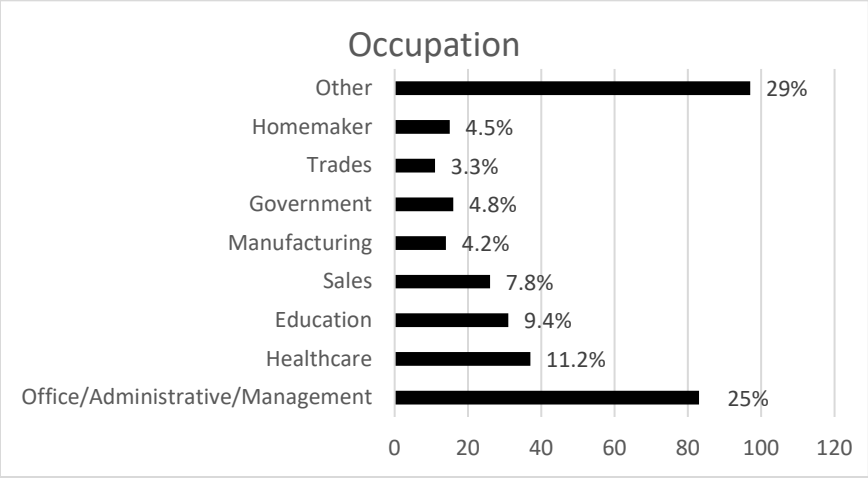


Figure 4.5: Participant Occupation

Technological proficiency: Participants were asked to self-assess their competence with computerized technology. 56% deemed themselves to be competent with technology and another 32% felt that they were proficient. 8% felt they were at the beginner stage, and at the other end of the spectrum, 4% felt that they were experts (See Figure 4.6).

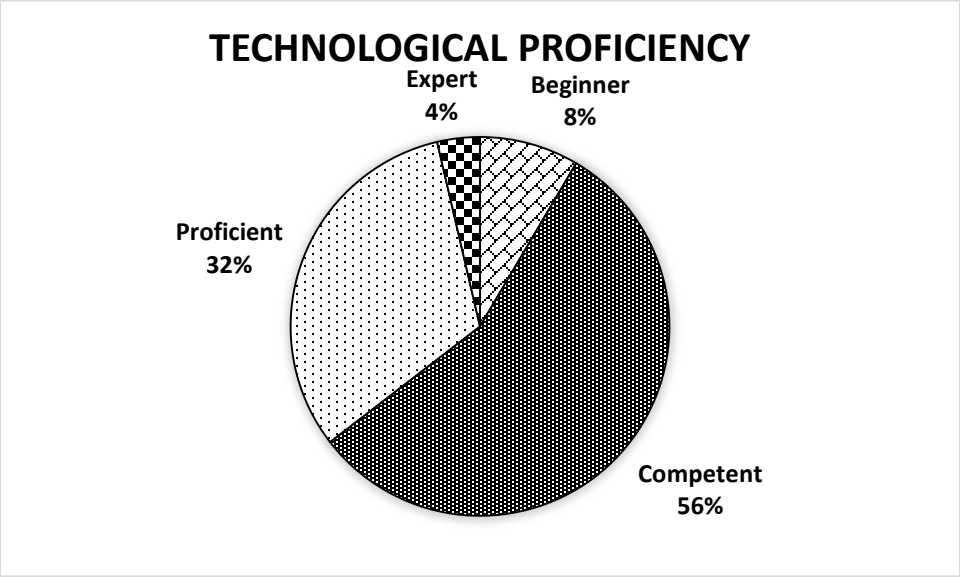


Figure 4.6: Participant Technological Proficiency

4.2 Survey Instrument Construction

To operationalize the conceptual model the survey instrument was adapted from extant literature. The constructs, their construction and their measurement scales are discussed below.

The model includes seven constructs, Use of Social Networking Sites, Perceived Financial Wellbeing, Perceived Health Status, Satisfaction with Offline Relationships, Bridging Social Capital, Bonding Social Capital and Loneliness. Four constructs were employed for Use of Social Networking Sites. The four constructs are Active Use, Contact Breadth, Public Information Sharing and Private Information Sharing. These four constructs are based on previous literature, and were created specifically for this research.

All constructs were measured using multiple items and 7-point Likert scales. The scale ranged from strongly disagree (1) to strongly agree (7).

In the development/adoption of the constructs, an extant literature review was undertaken in order to adopt existing constructs and to utilize the existing measurement instruments. The following discussion defines the constructs and the literature used in their measurement composition. For those constructs that were created for this body of research an in-depth explanation of their creation and the steps taken to verify their validity is included.

To ensure that the survey questions were actually assessing the constructs being studied, a pre-survey was done. There are several requirements for pre-surveys (Bowden et al., 2002). The first step is to create a guide with the intended definition of the construct, the meaning of each question and the criteria and methods used for evaluation. For this guide, the questions (measurements) were evaluated by another graduate student as well as a layperson.

The pre-survey was also evaluated to assess that the questions were easy to understand and that they gave an adequate measurement of the constructs. Pre-testing of the measurements had several steps. Step one was the assessment of measurement wording to determine if the interpretation and meaning were consistent with the definition (Bowden et al., 2002). The pre-testing was done by two persons, and then reassessed by two older adults. In this step, the questions were assessed for ease of understanding. The measurements were analyzed to determine if, when combined, they fully defined the construct and if all aspects of the construct were included in the measurements.

After creation of the measurement scales, all related documents for the survey were sent to the University Ethics Board for approval. The proposed study was reviewed and approved by the McMaster Ethics Review Board (MREB).

The next step in the process was to pilot test the survey. The pilot test was done over the summer of 2017, with 25 participants. The pilot survey indicated that most of the constructs were well defined with one needing minor adjustment. The adjustments are discussed below.

4.2.1 Perceived Financial Wellbeing: Perceived financial wellbeing is the perception of individuals as to how their finances affect their daily lives and their ability to live comfortably. The measurements were created using the definition and an extensive review of the literature on quality of life, social isolation and loneliness. The quality of life measures examined financial circumstances of the individual extensively, including adequacy of income for affording basic living expenses to luxuries (Burkhardt & Anderson, 2003: Bowling & Gabriel, 2004). The measurements were modified and streamlined using the findings from the case study by Gabriel and Bowling (2004) to accommodate the context of the research (See table 4.1).

Table 4.1: Measures for Perceived Financial Wellbeing

Perceived Financial Wellbeing is the individual's degree of satisfaction with their finances to meet their living needs, and their ability to live comfortably.		
Coding	Measurement	Reference
FN1	I have enough money to live on.	Bowling & Gabriel (2004)
FN2	My finances allow me to do everything I would like.	
FN3	I feel I am financially independent.	

4.2.2 Perceived Health Status: Health is an individual's perception of the impact their health has on their daily life. Subjective or perceived health status has been examined in many of the studies on social isolation and loneliness (Barg et al., 2006; Cornwell et al., 2008; de Jong Gierveld et al., 2015; Gilmour, 2012; Powdthavee et al., 2008; Thomas et al., 2015). The majority examine health from the individual's perspective on a scale of good to bad. The measurements for perceived health status that are used in the research were developed to understand the impact of individual perspectives of their health and its impact on daily life. Barg et al. (2006) used data collected from interviews with patients, examining psychological and functional health of the participants to create a general health score. Additional examination of health in relation to individual welfare was taken from the literature pertaining to quality of life. This literature examined health from the perspective of the individual separately as to physical capabilities and social functioning (Baernholdt et al., 2012; Farquhar, 1995). Netuveli et al., (2006) examined health in the context of limiting functionality, presenting the concept of level of health. Variances in poor or fair health that do not influence daily life negatively were not accounted for in the construct. The construct was created from the findings of the literature review, modifying and adjusting the measurements to accommodate the context of the research question (See Table 4.2).

Table 4.2: Measures for Perceived Health Status

Perceived Health Status is the individual's perception of their health and its impact on their daily life.	
Coding	Measurement
HE1	I feel I am healthy
HE2	I feel my health limits the activities that I am able to do.
HE3	My health does not affect my daily activities.

4.2.3 Satisfaction with Offline Relationships: Satisfaction with offline relationships is defined as an individual's perceived satisfaction with the number and quality of existing real world social connections (Hawkley et al., 2008; Savikko et al., 2005). Individuals that are satisfied with their social connections tend to use SNS as a substitute for other forms of communication (Antheunis, et al., 2015). The substitution of communication media when individuals are satisfied with their social connections would not create or increase social capital for an individual, but leave it unchanged (Blit-Cohen & Litwin, 2004).

Based on this definition, I utilized measurements from the UCLA and the de Jong Gierveld loneliness scale (de Jong Gierveld & Van Tilburg, 2006; Penning, et al., 2014; Williams, 2006). I also used the friendship scale created by Hawthorne (2006) as a guideline, to aid in defining the measures for satisfaction with offline relationships. The friendship scale was created using seven dimensions that contributed to social isolation as well as those that contributed to social connection, to help identify the measurements that would best describe individual happiness/unhappiness with their friendships. Loneliness scales associated with the quality of social relationships were used to create the construct (Penning, et al., 2014). Measurements were reworded slightly to fit the context of the research question and the construct being measured (See Table 4.3).

Table 4.3: Measurements for Satisfaction with Offline Relationships

Satisfaction with Offline Relationships is the individuals' perceived satisfaction with the number and quality of existing real world social connections (Hawkley et al., 2008; Savikko et al., 2005).		
Coding	Measurement	Reference
SOR1	I am happy with my relationship with friends and family without using online social networking.	Penning et al. (2014)
SOR2	I feel I have enough friends without using social networks.	
SOR3	I feel I have enough friends without using social networking sites.	
SOR4	I feel I am part of a group of friends so I don't need to use social networking sites.	
SOR5	I feel the quality of my social relationships is good without using social networking sites.	

4.2.4 Bridging Social Capital: BRISC represents weak ties, consisting of friends and acquaintances that are outside one's strong network ties of family and close friends (Erikson, 2011). These social relationships provide loose connections for information (Antheunis, et al., 2015). Social capital has been utilized in many different studies so the measurements for both bridging and bonding are well established. BRISC was defined by Putnam (2000) as the social connections individuals make from different backgrounds, and Granovetter (1973) referred to these as weak ties. The indicators for bridging have been studied and refined. For this study, they were adopted from Williams (2006). The indicators used were also compared to those of the loneliness indicators. Those that tended to overlap both constructs were not used (See Table 4.4).

Table 4.4: Measures for Bridging Social Capital

BRISC is a form of weak ties, consisting of friends and acquaintances that are outside of one's strong tie network of family and close friends (Erikson, 2011). These social relationships provide loose connections for information. (Antheunis, et al.,2015).		
Coding	Measurement	Reference
BRSC1	I feel my circle of friends on social networks is too limited.	Williams (2006)
BRSC2	On social networks, there is always someone I can talk to.	
BRSC3	Based on the people I interact with on social networking sites it is easy for me to find useful information.	
BRSC4	The people I interact with on social networking sites help keep me current on the news.	
BRSC5	The people I communicate with on social networks help keep me current with what is new and popular.	
BRSC6	There are people on social networks that I have a lot in common with.	
BRSC7	I like interacting with others on social networking sites as I learn new things.	
BRSC8	Social networks have enabled me make new connections to others.	

4.2.5 Bonding Social Capital: BOSC represents strong ties between each other. Bonding includes connections between kin or close friends, providing emotional support for individuals (Antheunis et al., 2015). Social capital has been defined and utilized in many previous studies. BOSC is defined as the strong ties an individual has. These are normally with family and close friends (Granovetter, 1973). The measures that were adopted for this study are from Williams (2006). As the measurements for social capital and loneliness tend to overlap, the indicators were scrutinized fully and compared to loneliness measures (The UCLA and de Jong Gierveld loneliness measures). Those that were similar in context were removed or used for social capital measures. The following measures were adapted from William (2006) (See Table 4.5).

Table 4.5: Measurements for Bonding Social Capital

Bonding is a form of strong ties between each other. It includes connections between kin or close friends, which provides emotional support for individuals. Antheunis et al., 2015).		
Coding	Measurement	Reference
BOSC1	I use social networks to feel closer to someone.	Williams (2006)
BOSC2	On social networks, there is someone I can discuss intimate problems with.	
BOSC3	There is no one on social networks that I fell comfortable discussing personal problems.	
BOSC4	There is someone I can turn to for advice about making very important decisions on social networks.	
BOSC5	I use social networks to communicate with people I fell close too.	
BOSC6	There are several people that I trust to help me solve my problems on social networks.	
BOSC7	There is always someone to chat with on social networks about my day-to-day problems.	
BOSC8	The use of social networks enables me to connect quickly with my close connections	

4.2.6 Loneliness: Loneliness has been researched extensively with several well-defined measures and definitions that are available for use. Loneliness is the individual's perception of the lack of close emotional attachments to others and/or the absence of social connections (de Jong Gierveld & Van Tilburg, 2006). For this research, loneliness is defined as an individual's perceptions of the lack of meaningful social connections that cause them emotional distress. The indicators used for the measurement of loneliness were adopted from the UCLA and de Jong Gierveld measurements for loneliness (Penning et al., 2014). The measurements were examined in context with both forms of social capital, since some of the indicators used as indicators for loneliness could be used as indicators of social capital. Any of the measures that overlapped with either BOSC or BRISC were removed as indicators for loneliness. The measures for Loneliness are given in Table 4.6.

Table 4.6: Measures for Loneliness

Loneliness is defined as individual perceptions of the lack of meaningful social connections that cause them emotional distress.		
Coding	Measurement	Reference
LON1	I lack companionship.	Penning et al., 2014
LON2	I experience a general sense of emptiness.	
LON3	I feel isolated from others.	
LON4	I am unhappy being so withdrawn.	
LON5	I am unhappy being isolated from others.	

4.2.7 Use of Social Networking Sites: Use of SNSs is defined as how an individual utilizes an SNS. Utilization refers to, who, how, what and when an individual interacts with SNSs. This is an overall category with several constructs within it. This category gives an overview of the different aspects of utilizing SNSs. These different dimensions are examined in detail below and refer to the level of intimacy an individual has when interacting with others, how many connections they have, the types of relationships, and the level of content creation and consumption of the content provided by others.

4.2.7.1 Active Use: Active use is defined as posting messages, commenting on content provided by others, or interacting with others on SNSs. Active Use of SNSs is determined by the level of interaction an individual has with others when using SNSs, and involves the creation of content and interaction between users. The related measures were created using this definition and the extensive literature on active/ passive (lurking) use of social media (Arnold & Paulus, 2010;

Morrison et al., 2013; Muller, 2012; Preece et al., 2004; Ridings et al., 2006). The measures are given in Table 4.7.

Table 4.7: Measurements for Active Use

Active Use is defined as posting messages, commenting on others content or interacting with others on SNSs.	
Coding	**Measurement**
A/PU1	I use social networks to send pictures to specific people and/or post for everyone.
A/PU2	I use social networks to send videos to specific people and/or post for everyone.
A/PU3	I post comments on others posts and blogs in social networks.
A/PU4	I use social networks to email others.
A/PU5	I use social networks to have conversations with others using text, voice, or video.
A/PU6	I use social networks to express my views by posting them.
A/PU7	I use social networks to forward information I have read to others.
A/PU8	I use social networks to express my view by posting them.
A/PU9	I use social networks to forward information I have read to others.

4.2.7.2 Contact breadth: Contact breadth is defined as the type and number of social connections an individual has. To be more explicit, this refers to the network of individuals/ groups to which a person is connected. With this definition of contacts, the original measures were adopted from Ellison (2007) and Mislove et al. (2007). This had some issues in the pilot study, and gave little information as to the makeup of the social network with some of the measures requiring adjustment. Further measures were adapted from Litwin (2001) to measure the social network of the individual. The new measures enabled stratification of the difference in composition among individuals of their different social networks. These new measures also showed the type of network (strong or weak ties) to which the individual is connected (See table 4.8).

Table 4.8: Measurements for Contact breadth

Contact breadth is the number and type of social connections an individual has on SNSs.		
Coding	**Measurement**	**Reference**
CP1	Do you connect with family members on social networks?	Ellison (2007) Litwin (2001)
CP2	Do you connect with friends on social networks?	
CP3	Do you connect with acquaintances on social networks?	
CP4	Do you connect with new friends on social networks?	
CP5	Do you connect with strangers on social networks?	
CP6	Do you connect with high school friends on social networks?	
CP7	Do you connect through religious groups on social networks?	
CP8	Do you connect through hobby groups on social networks?	
CP9	Do you connect through special interest groups on social networks?	
CP10	Do you connect through clubs on social networks?	
CP11	Do you connect through other groups on social networks?	

4.2.7.4 Message Content: Message content examines the level of intimacy in the messages exchanged. Message content is defined as the type of information being exchanged between participants, that being either private (personal) or public information (informational in content). For better clarity and understanding of the message content, the construct was subdivided. The constructs were defined as public information sharing and private information sharing. This was done to gain a better understanding of their relationship with social capital and loneliness. The measurements were created using the definition and the extensive literature on intimacy, personal and public information shared on SNSs or social media (Bazarova, 2012; Horton & Wohl, 2006; Pedroni et al., 2014; Rau et al., 2008).

Table 4.9: Measurements for Message Content

Message Content refers to the information shared as being public or private information.		
Coding	**Measurement**	**Reference**
Private Information Sharing		
CT1	I use social networks to communicate personal information with others.	(Bazarova, 2012; Horton & Wohl, 2006; Pedroni et al., 2014; Rau et al., 2008)
CT2	I use social networks for communication of an emotional nature, such as issues with relationships, health problems etc.	
CT3	When I want to have a private chat with friends or family, I use social networks to communicate with them.	
Public Information Sharing		
CT4	I use social networks to share public information with others.	(Bazarova, 2012; Horton & Wohl, 2006; Pedroni, Pasquali, & Carlo, 2014; Rau, Gao, & Ding, 2008)
CT5	I use social networks to obtain information from my connections	
CT6	I use social networks for finding public information such as news, blogs, etc.	

5. Instrument Validation

This chapter presents the validation results of the quantitative study including the results from the reliability scale, validity and correlation analysis of the constructs and the model. The model was validated using Structural Equation Modeling (SEM). SEM allows for causal analysis and more specifically enables path analysis and confirmatory factor analysis (Ullman & Bentler, 2013).

SmartPLS 3.0 was utilized during the pilot stage of the research due to the small sample size of the pilot, as PLS-SEM (partial least square structural model) is better than CFA (confirmatory factor analysis) for handling smaller sample sizes (Hair et al., 2011; Tenehaus, 2006). Likewise, SmartPLS 3.0 was utilized for validating and testing the measurements and testing of the research model examined, which provided continuity with the pilot study (Hair et al., 2017). Further, as the SEM model is used for theory development or expansion of the different facets of SNSs, partial least squares (PLS) is the preferred method for theory development and prediction (Hair et al., 2011). Thus, SmartPLS 3.0 was used for the analysis of the model, for the purpose of data analysis and model validation. The evaluation of the research model was in two steps: (1) evaluation of the reliability and validity of the measurement model and (2) the evaluation of the structural model.

To verify that the model is both statistically sound and the methodology employed does not impact on measurements, analysis and the results, preliminary data analysis was utilized. The

model was assessed for validity and reliability during both steps of the research. The statistical tests methods are reviewed in Table 5.1.

Table 5.1: Statistical Measures for the Constructs

Analysis	Test Heuristic	Heuristic
Reliability of measurement Instruments	Cronbach's Alpha	Acceptance criterion:α>0.70 (Gefen et al., 2000)
	Composite reliability	Acceptance criterion: Value >0.70 (Gefen & Straub, 2005)
Convergent and Discriminant Validity	Item cross-loading Factor loadings over >0.7 with t-value>1.96	Acceptance criterion: The loading on the corresponding construct should be larger than loading on other constructs by at least 0.10 (Chin, 2010; Henseler et al., 2016b)
	Factor Loadings	Acceptance criterion: Factor loadings >0.70, with a t-value >1.96 (Chin, 2010; Gefen & Straub, 2005)
	Fornell-Larker Criterion. AVE > Cross correlations	Acceptance criterion: The square root of the AVE (average variance extracted) > the correlation of the construct with other model constructs (Gefen & Straub, 2005)
	Heterotrait-Monotrait Ratio	Acceptance criterion: <0.85 (Henseler et al., 2016b)
Multicollinearity	VIF	Variance Inflation Factors (VIF) greater than 3.3 indicate potential multicollinearity issues (Petter et al., 2007)

A pilot study was conducted to validate the constructs and the model. Further refinement of the survey document was undertaken to address the issues revealed. The full collection of data for this body of research was conducted by an outside organization (Qualtrics) after model validation.

5.1 Pilot Phase

The pilot study showed that the indicators for the model are valid and reliable. As seen in Table 5.2 the constructs were valid and reliable. Construct validity, convergent validity and discriminant validity were examined to assess the reflective constructs. Convergent validity was assessed by examining internal consistency to determine the amount of variance the measurements have in common or the amount that they converge to (Hair et al., 2010). At this stage of the model formation the use of factor loadings and average variance extracted were used to assess convergent validity. First, factor loading were assessed, ensuring that the majority of the measurements had a factor loading above the 0.7 threshold and were significant with a t-value > 1.96 (Chin, 2010). Next, the AVE for all of the constructs was found to be above 0.5, with the exception of Bonding Social Capital with a 0.476 (See Table 5.2) (Gefen et al., 2000). However, as the sample size was very small for the pilot, it was expected that the AVE would increase to above 0.5 in the full study. To assess the reliability of the individual constructs Cronbach's alpha reliability coefficient was used (Cronbach, 1951; Brahama, 2009). The Cronbach's alpha was above the tolerance level of 0.7, with the exceptions Perceived Health Status and Contact breadth. These had Cronbach's alpha just below the 0.7 threshold. The Perceived Health Status construct was confirmatory in nature (Garson, 2012), and as it is approaching the 0.7 level of tolerance the construct was not adjusted as the small sample size of the pilot might be causing the issue. The construct Contact Breadth was also just below the tolerance level, but the measurements for it were expanded and changed to allow for a more complete measurement. To further determine construct reliability, the composite

reliability (CR) was analyzed, with all the constructs having CR above the 0.7 threshold. Based on the pilot study it was determined that the model and the constructs were valid.

A few changes were made to the survey document after the pilot study was completed and the results analyzed. One question was reworded slightly as some of the participants had difficulty understanding it. Further measures were added to the construct contact breadth in order to generate a better understanding of the types of connections an individual has when analyzing how it actually affects social capital. The original four measurements are discussed in section 6, with the addition of eleven measures shown in section 4.2.7.3 in Table 4.9.

Table 5.2: Measure for Constructs-Pilot Study

	Cronbach's Alpha	Composite Reliability	Average Variance Extracted (AVE)
Active Use	0.855	0.890	0.512
Intensity of Use	0.714	0.823	0.619
BOSC[2]	0.725	0.819	0.476
BRISC[3]	0.912	0.935	0.743
Contact Breadth	0.671	0.823	0.706
Perceived Financial Wellbeing	0.935	0.951	0.831
Perceived Health Status	0.656	0.837	0.722
Informational Sharing	0.827	0.920	0.852
Private/Emotional Content	0.722	0.787	0.560
Loneliness	0.730	0.857	0.685
Satisfaction of Relationship	0.820	0.854	0.599

[2] Bonding Social Capital (BOSC)
[3] Bridging Social Capital (BRISC)

5.2 Main Study

The model (See Figure 3.1) is comprised of 10 constructs. Two are formative and eight reflective. Loneliness, BRISC, BOSC, Perceived Health Status, Perceived Financial Wellbeing, Satisfaction of Relationships, Public Information Sharing and Private Information Sharing are reflective. The construct Message Content was subdivided into two further constructs, Public Information Sharing and Private Information Sharing after the pilot phase, as outlined in the above paragraph. Both additional constructs are reflective. Active Use and Contact Breadth are formative. Exogenous variables included BRISC, BOSC and Loneliness; all other constructs are endogenous.

5.2.1 Outliers

Outliers are instances when a variable shows extreme or unusual values (Meyers et al., 2006). To detect univariate outliers, for each of the constructs the composite scores were calculated. First, the indicators for each of the constructs were compared to assess for consistency in the answers. All reflective constructs showed consistency of the indicators for the constructs. Secondly, box plots were prepared using IBM SPSS Statistics 24 to help assess for univariate outliers. No outliers were identified in this portion of the analysis.

5.2.2 Reliability Analysis

To ensure the measurements were consistent, the constructs were tested for reliability. Reliability refers to the extent that the set of measurement items is consistent in measuring the relevant construct (Straub et al., 2004). SmartPLS 3.0 was utilized to calculate Cronbach's alpha and the composite reliability (CR) for each of the constructs (See Table 5.4). All the constructs

showed acceptable reliability in that CR > 0.7 and α > 0.70 (See Table 5.4) (Gefen et al., 2000). Thus, it can be concluded that the measures are reliable so the results of the model analysis will not suffer from measurement error.

Table 5.3: Measures for Constructs –Full Study

Construct	Cronbach's Alpha	CR	(AVE)
Active Use			
BOSC	0.874	0.909	0.667
BRISC	0.834	0.889	0.668
Contact Breadth			
Loneliness	0.904	0.929	0.723
Perceived Financial Wellbeing	0.877	0.924	0.802
Perceived Health Status	0.861	0.915	0.783
Private Information Sharing	0.724	0.844	0.644
Public Information Sharing	0.719	0.842	0.640
Satisfaction of Relationship	0.856	0.911	0.774

5.2.3 Validity Analysis

Construct validity is the extent to which the measurements actual define the construct (Gefen & Straub, 2005). This is shown if the construct measurements adequately correlate with each other (convergent validity) and each construct is differentiated adequately from the other constructs (discriminant validity) (Straub et al., 2004). Four techniques were employed to assess construct validity, including factor loadings, cross loading analysis, Fornell-Lacker Criterion and Heretotrait-Monotrait Ratio.

Convergent validity explains how well the measurements build the construct. The first step in determining convergent validity was to assess the factor loadings of the measurements. The construct measurements were also analyzed at this stage to assess their loadings and weights (See Table C.6). The loadings and weights were all shown to be acceptable and significant with t-values > 1.96 (See Table C.5) (Chin, 2010). Next, the cross loadings of the measurements were assessed to determine if they were not loading heavily on the other constructs, with loading mainly on the appropriate construct (See Table C.3) (Chin, 2010). Thus, the constructs are seen to have convergent validity.

Further, the Fornell-Larker criterion was utilized to evaluate the discriminant validity of the constructs (Gefen & Straub, 2005). This method requires that the square root of AVE is larger than the correlations with the other constructs (Gefen & Straub, 2005). The results, shown in Table C.4, suggest adequate validity of the constructs. The last method to evaluate discriminant validity is the Heterotrait-Monotrait ratio (HTMT) of correlations (See Table C.7). This ratio is an estimate of the correlations between the various constructs. The ratio was below 0.85 in all cases, indicating that there is discriminant validity in the measures. Based on the above analysis, it appears that that constructs have discriminant validity (Henseler et al., 2016).

5.2.4 Multicollinearity Analysis

Further assessment of construct validity was done through an examination of variance inflation factors (VIF) to assess collinearity of the indicators for the formative constructs (Active Use and Contact Breadth). Collinearity must be below the threshold of 3.3 to ensure that the

indicators are measuring separate aspects of the construct. This threshold was above all of the VIFs, suggesting that each indicator was measuring a separate aspect of the construct it was creating (See Figures 5.1 and 5.2) (Hair et al., 2011).

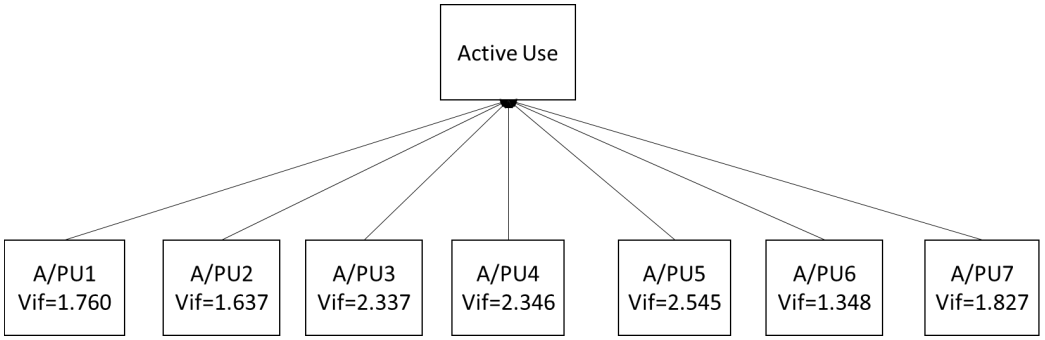


Figure 5.1: VIF Active Use

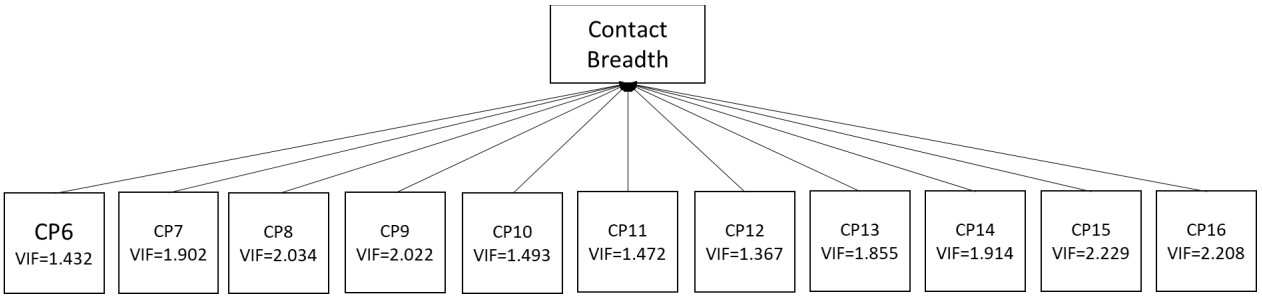


Figure 5.2: VIF Contact Breadth

5.2.5 Common Method Bias

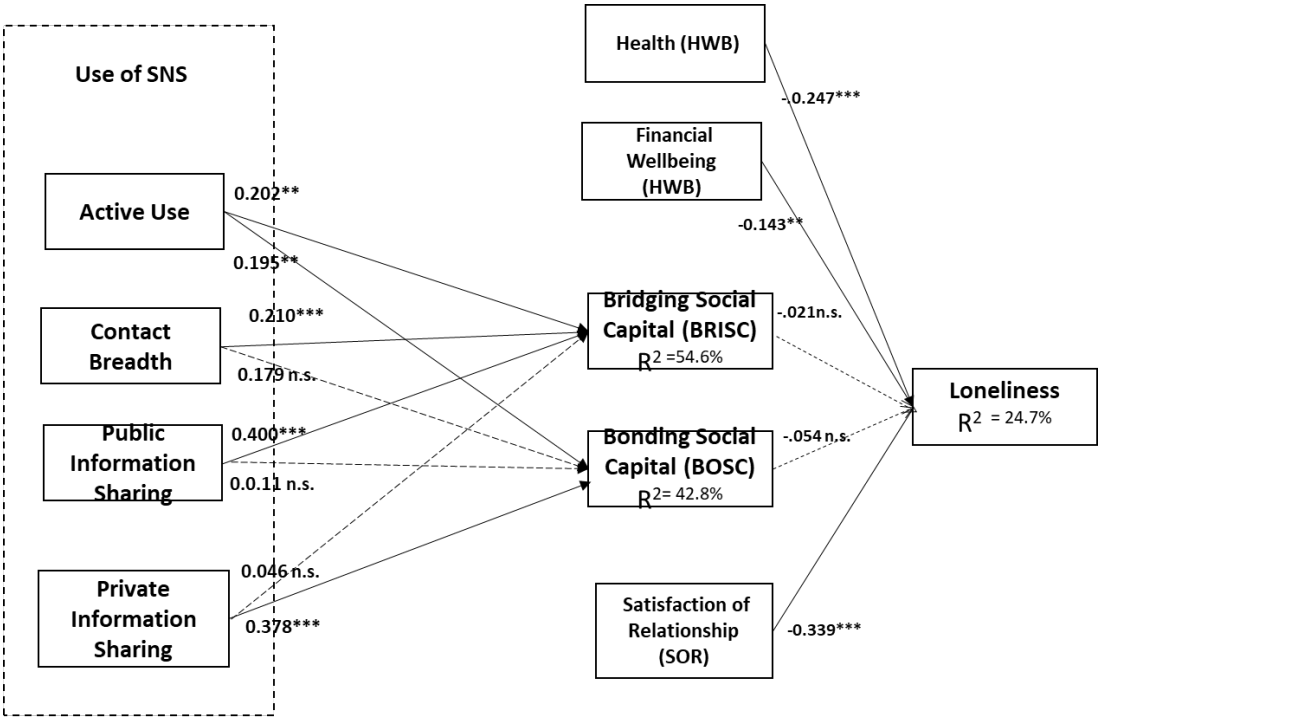
The model was assessed for common method bias as the data were collected using a self-reported survey, since the variance in the measurements can be caused by the method of collection

rather than the constructs measured (Podsakoff et al., 2003). As recommended by Podsakoff et al, (2003) common method bias should not be substantial in accordance with Malhorta et al. (2006). During creation of the model and the survey instrument, attempts were made to reduce the issue of common method bias. In particular, to control common method bias, measurements for constructs that have a hypothesized relationship were not placed together in the survey (Podsakoff et al., 2003).

The model was assessed for common method bias using several different tests. Harmon One Factor analysis was used first to assess for common method bias, with no factor rotation. No single factor emerged from this analysis and no general factor accounted for the majority of the covariance among the measures, the largest being 0.477 (See Table A.2) (Podsakoff et al., 2003). Additionally the correlation matrices were examined for common method bias. As suggested by Bagozzi (1991) the correlations amongst the constructs should all be below 0.9 (See Table A.8), and all the correlations were below this threshold, over-ruling possible common method bias. Further, the variance inflation factors (VIF) for all constructs were assessed, with a criterion of being less than 5.0 (Koch, 2015) (See Table A.1in Appendix). Using the more stringent threshold of 3.3, two measurements were slightly above the tolerance level (LON2 at 3.616 and LON3 at 3.492). Thus, the VIF method did not indicate common method bias. The as the constructs show discriminant and confirmatory validity, suggesting that common method bias is not an issue in the model.

6. Analysis of the Quantitative Study

In this chapter, the results from testing the structural equation model are presented for the hypothesized relationships stated in chapter 3. A post hoc analysis is also presented. The standardized coefficients of the paths were measured, since these path coefficients indicate the strength of the relationships between the dependent and independent constructs (Chin, 2010). A summary of the path coefficients, t-values and p-values for the individual hypotheses are given in Table 6.1. The model is shown in figures 6.1 and 6.2 with the path coefficients and p-values. The model is broken down into part A and B, for ease of use, as the model complexity makes it difficult to show the paths and their values in a single model easily.



Note: Values on line paths are the coefficients and their p-values.
n.s.=not significant *p<0.01, **p<0.05, ***p<0.001

Figure 6.1: Model Part A

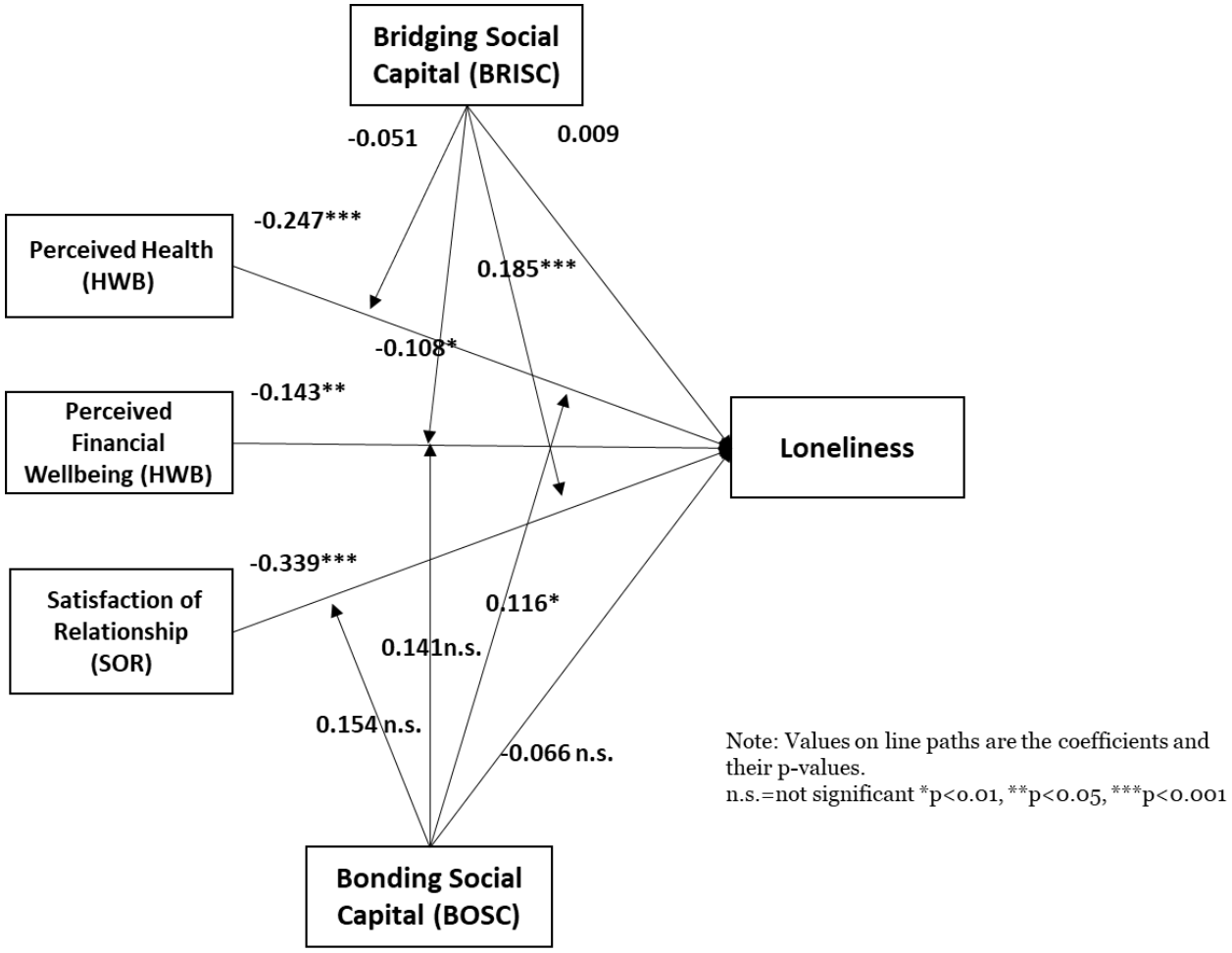


Figure 6.2: Model Part B. Showing the moderation effects

Table 6.1: Hypothesis Results

Hypothesis	Path	Coefficient	T Statistics	P Values	Outcomes
H1a	Active Use -> BRISC	0.195	3.074	0.002	Supported
H2a	Active use -> BOSC	0.202	2.745	0.006	Supported
H1b	Contact Breadth ->BRISC	0.210	3.225	0.001	Supported
H2b	Contact breadth -> BOSC	0.179	2.452	0.015	Supported
H1c	Public Information Sharing -> BRISC	0.400	7.695	0.000	Supported
H2c	Public Information Sharing -> BOSC	0.011	0.181	0.856	Reject
H1d	Private Information Sharing ->BOSC	0.046	1.003	0.317	Reject
H2d	Private Information Sharing-> BOSC	0.3.78	7.141	0.000	Supported
H3	BRISC -> Loneliness	-0.021	0.377	0.706	Reject
H4	BOSC -> Loneliness	-0.054	0.882	0.378	Reject
H5	Perceived Financial Wellbeing -> Loneliness	-0.247	4.790	0.000	Supported
H6	Perceived Financial Wellbeing -> Loneliness	-0.143	2.621	0.009	Supported
H7	Satisfaction with offline Relationships-> Loneliness	-0.339	7.029	0.000	Supported
H8a	Moderation effect of BRISC on Perceived Health Status ->Loneliness	-0.051	0.698	0.485	Reject
H8b	Moderation effect of BRISC on Perceived Financial Wellbeing->Loneliness	-0.108	2.193	0.029	Supported
H8c	Moderation effect of BRISC on Satisfaction with Offline Relationships ->Loneliness	0.185	8.277	0.000	Supported
H9a	Moderation effect of BOSC on Perceived Health Status ->Loneliness	0.116	0.938	0.014	Supported
H9b	Moderation effect of BOSC on Perceived Financial Wellbeing->Loneliness	0.141	0.898	0.369	Reject
H9c	Moderation effect of BOSC on Satisfaction with Offline Relationships ->Loneliness	0.154	2.479	0.349	Reject

6.1 Social Capital

The empirical test of the model indicates that some of the hypotheses were rejected, while others were accepted. The use of SNSs has been shown to have a positive influence on both BOSC and BRISC. The findings suggest that the increase in social capital is dependent on the facet of use and not just the use of SNSs. This will be discussed in the next section pertaining to use of SNSs.

6.2 Social Networking Site Use

The model results show that some of the dimensions of SNS use have an impact on BRISC and BOSC, while others do not. The different hypotheses will be discussed in this section.

6.2.1 Active Use

Active use of SNSs positively influences BRISC ($\beta = 0.202$, $p < 0.01$) as hypothesized (H1b) in the model. This suggests that active use, which involves interacting with others on SNSs, resulted in an increase in BRISC. Active use of SNSs positively influences BOSC ($\beta = 0.195$, $p < 0.01$) (H2b) significantly. Thus, implying that connecting and interacting with family and close friends via SNSs has a significant impact on BOSC. The influence of actively using SNSs indicates that the more interactive older adults are, through posting, broadcasting and directly communicating with others (interacting with others) their social connections will increase. This suggests that cyber relationships need to be nurtured and strengthened through contact and interaction, the same as in the physical world.

6.2.2 Contact breadth

Contact breadth (the range and variety of an individual's connections) was also examined as a facet of the use of SNSs. The results support (H1b) in that a broad contact breadth positively influences BRISC (β=0.210, p> 0.001). The results do not support (H2b) that a narrow contact breadth positively influences BOSC (β=0.179, p>0.05). Thus, the results suggest that the type of contacts or the breadth of the connections impacts the level of social capital for older adults.

Further examination of the contact breadth was done to gain a greater understanding of it and its influence on social capital. The number of contacts participants have was requested in the survey, as shown in Figure 6.3. Half the participants had 50 or fewer connections while the other half had over 50 connections in SNSs. In addition, 27% of the participants had 20 or fewer connections in SNSs, suggesting that they are only in contact with family and friends, especially when this is examined in context with the type of connections (See Figure 6.7) participants had. It should also be noted that the composition of the types of connections was predominately made up of family and friends, as shown in Figure 6.4. 304 of the 330 participants had family members in their contact list, with slightly more friends in their contact list at 309. Thus, over 90% of the participants had family and friends as connections in SNSs. The type and number of connections for older adults does indicate an influence over social capital for them. This implies that the number or type of connections one has that enhances and extends social capital through use of SNSs.

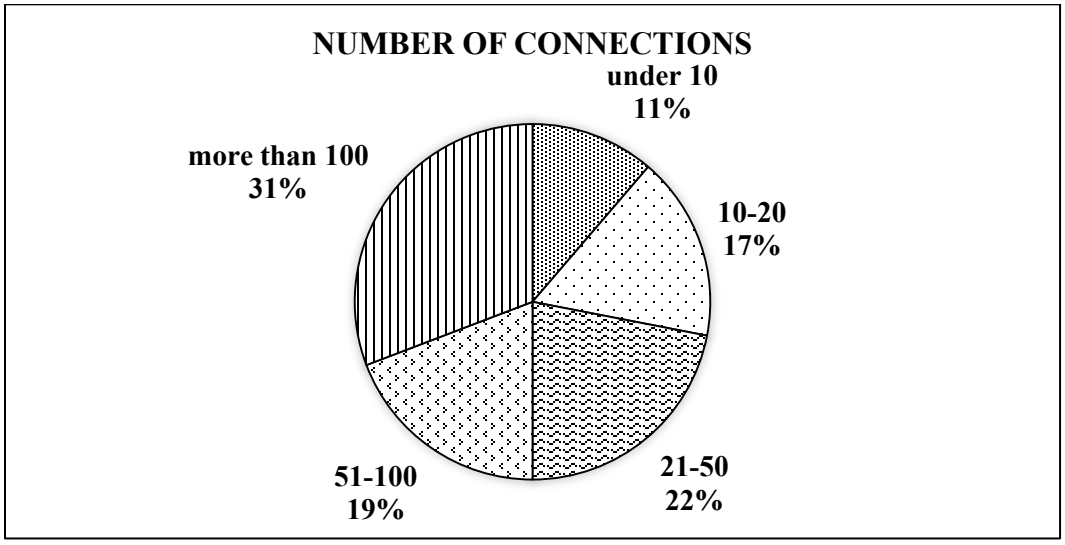


Figure 6.3: Number of Connections

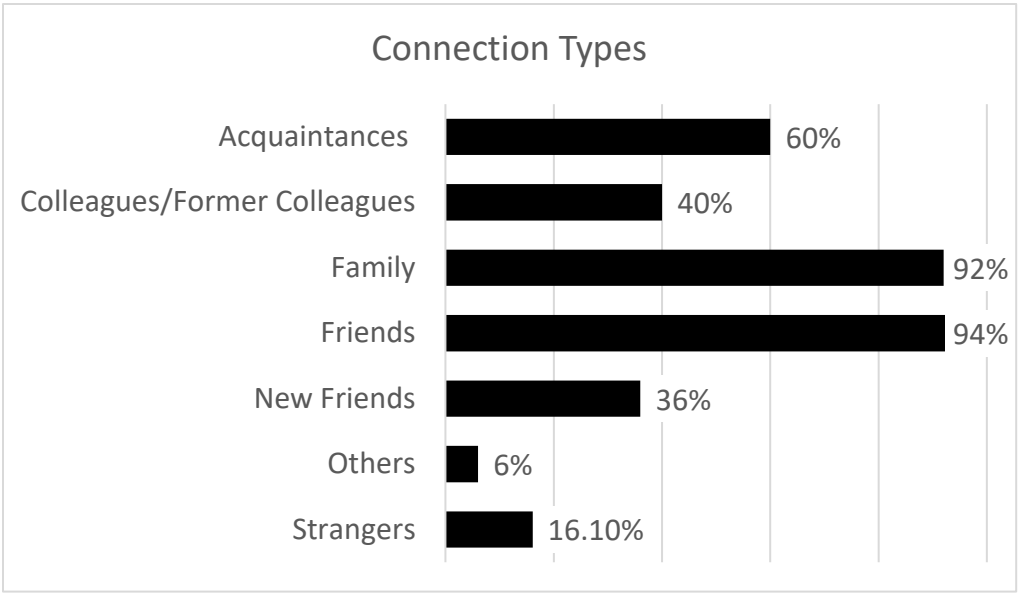


Figure 6.4: Connection Types

6.2.4 Message Content

Message content was subdivided into two categories, private information sharing and public information sharing. The relationship of public information sharing in communication using SNSs positively influenced BRISC (β=0.400, $p < 0.000$), hypothesis H1c, was supported. Yet, Information Sharing positive influence on BOSC (β=0.011, $p > 0.05$), hypothesis H2c, was not supported. As predicted, the sharing of information tends to extend and enhance the relationship between weak ties for older adults. Yet, the influence of sharing with close friends and family does not extend nor enhance the relationship. This could suggest that there is an expectation, from close ties, that sharing information comes naturally from the close connections. It appears that sharing information is part of the relationship and thus may not extend and enhance BOSC, but maintain it.

The messages containing private information sharing have an influence on BOSC (β=0.378, $p< 0.000$), hypothesis H2d, was found to be significant. The relationship between messages containing private information sharing had no influence on BRISC (β=0.046, $p >0.05$), so hypothesis H1d was not supported. This indicates that BOSC was impacted positively when an individual's messages contained private/emotional content. However, the influence of private and emotional message content on BRISC had no impact on the relationship.

6.3 Bonding and Bridging Social Capital

BOSC and BRISC were found to have a high correlation of 0.574.This suggests that both bonding and bridging social capital are influenced by the same factors to a large degree. Also,

when examining the levels of the two types of social capital for individuals they tend to be very similar in strength. A further comparison assesses the level of both types of social capital and by comparing them (Figure 6.5). The result suggests that the level of BOSC and BRISC are highly correlated, and the trend line shows that the relationship is a positive linear one. This appears to indicate that the amount of social capital is related to the individual, so that when one form of social capital increases the other form of social capital will also increase.

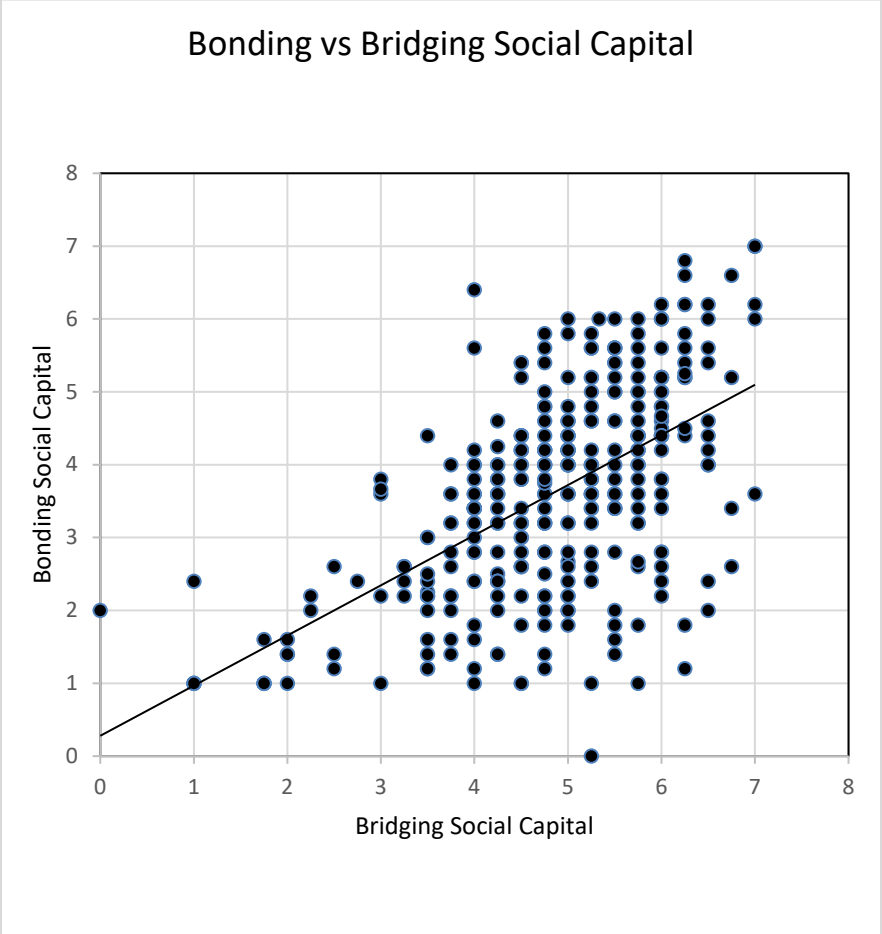


Figure 6.5: Bonding and Bridging Social Capital a Comparison

6.4 Loneliness

The constructs of perceived health status, perceived financial wellbeing and satisfaction with offline relationships were hypothesized (H5, H6 and H7) to reduce loneliness. This was supported, since good health reduced loneliness (β= -0.247, $p < 0.000$). Perceived financial wellbeing, H6, was supported, since it reduced loneliness (β= -0.143, $p < 0.01$). H7is also supported in the model, such that satisfaction with offline relationships reduces loneliness (β= -0.339, $p < 0.000$).

The model explained 24.6% of the variance in loneliness. Social capital created through the use of SNSs for both BRISC and BOSC were hypothesized to reduce loneliness, H3 and H4, but both hypotheses were not supported. Here, BRISC did not show a significant negative influence on loneliness (β=0.009, $p > 0.05$), and BOSC did not show a significant negative influence on loneliness (β= -0.066, $p > 0.05$). Furthermore, when examining the model with only BOSC and BRISC, just over 2% of the change in loneliness was explained (See Figure 6.6). Thus, social capital created through SNSs has little direct effect on loneliness.

A further evaluation of participant loneliness was conducted. This found that 16% of the respondents were slightly lonely to very lonely (See Figure 6.6). But the majority of the respondents stated that they were not lonely. This is comparable to the findings of Gilmour (2012) that 19% of older Canadian adults were socially isolated. This small difference could be due to statistical randomness or it could be that our participants were slightly less lonely as they are using SNSs to compensate for lack of offline social connections.

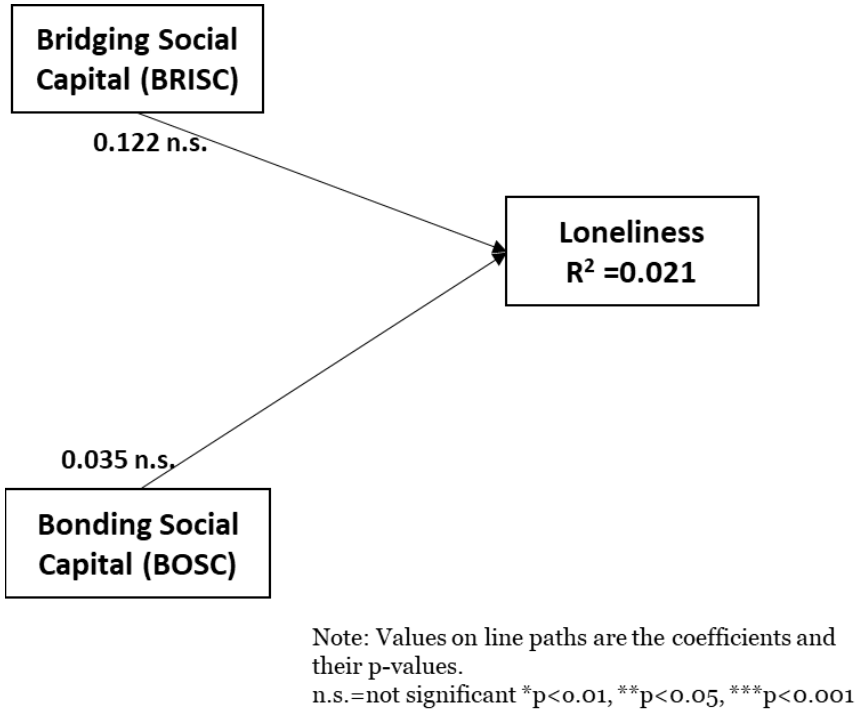


Figure 6.6: Social Capital and Loneliness (Part B Bosc, BRISC and Loneliness)

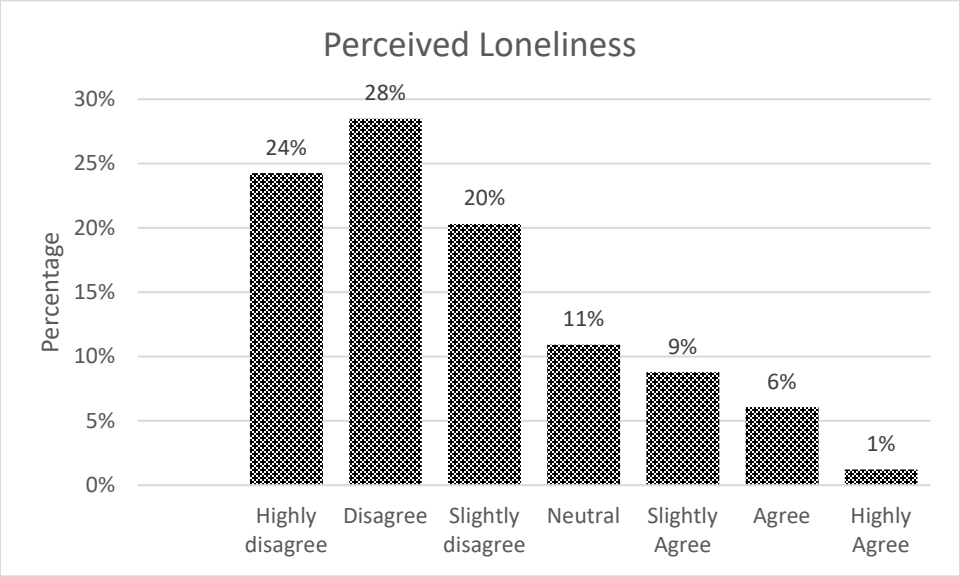


Figure 6.7: Level of Loneliness of the Participants

The model was further analyzed using WarpPLS, to assess if the relationship between BOSC, BRISC and loneliness is non-linear. Hypothesis H3 and H4 were still not supported, through a non-linear relationship between BOSC and BRISC on loneliness.

6.5 Moderation Effects

Indirect influences on loneliness were examined through moderation effects. Both BOSC and BRISC were found to indirectly influence loneliness. BRISC and BOSC were explored in more detail to give a greater understanding of this indirect influence of social capital on loneliness. The hypothesized results of the moderation effect are given in Figure 6.2 at the beginning of this chapter. Further examination of the moderation effects was done, with the use of common

moderation plotting techniques (See Figure 6.8, 6.9 and 6.10) (Ping Jr., 1995). The moderation plotting techniques used SmartPLS with each moderation run individually.

The first relationship examined was that of perceived health status and loneliness. The relationship was examined to determine if BOSC or BRISC weakened it. Perceived health status was shown to reduce loneliness. The hypothesis H8a (β= -0.051, p> 0.05) that BRISC moderated perceived health status influence on loneliness was found not to be significant. However, the hypothesis H9a, (β= 0.116, $p < 0.05$) was found to be significant in that BOSC moderated the relationship between perceived health status and loneliness. The moderation effect was used to gain a further understanding of the effect that BOSC has on perceived health status and loneliness (See Figure 6.8, labelled "Moderating Effect 1"). This illustrates that BOSC is able to reduce the impact of poor health on loneliness for older adults. That is, older adults with greater levels of BOSC due to SNS usage that were in poor health were less lonely.

Participants that had more BOSC due to SNS usage, but were also healthy seemed to be lonelier than their peers that had a lower level of BOSC. This suggests that increasing BOSC by using SNS is beneficial for those who were of poor health, while the effect was just the opposite for healthier individuals. This could be due to increasing utilization rates that tend to increase social capital to the detriment of maintaining other offline relationships, thereby causing an increase in loneliness.

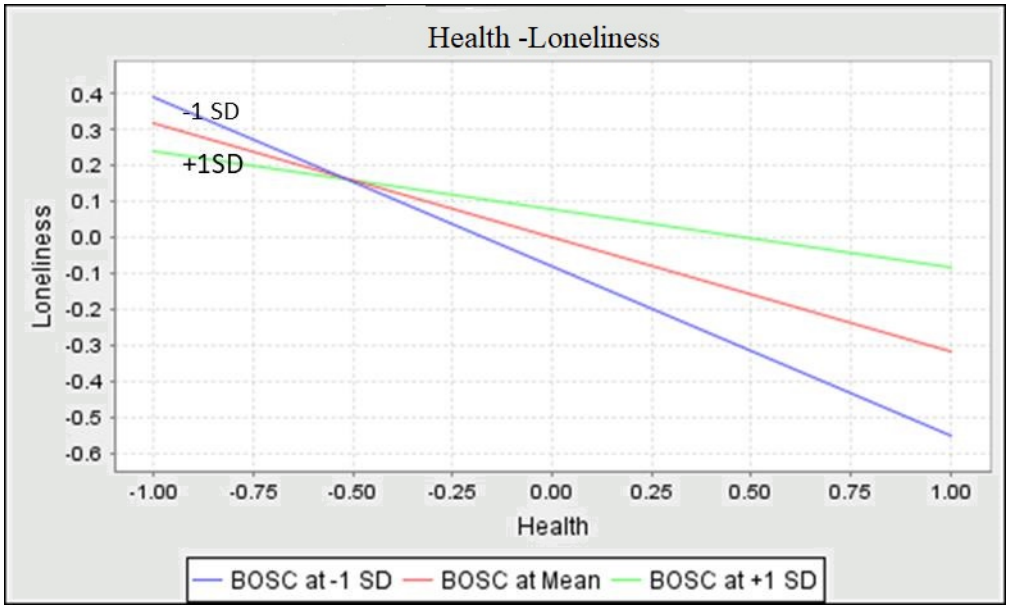


Figure 6.8: Moderation Effects of Bonding Social Capital on the relationship between Health and Loneliness

The second relationship examined for moderation effects was that of perceived financial wellbeing and loneliness. BOSC and BRISC were both hypothesized to weaken the relationship, H8b (β=0.185, $p<0.05$) and H9b (β=0.154, $p>0.05$). BOSC did not have a significant impact on the relationship between perceived financial wellbeing and loneliness. However, the relationship between perceived financial wellbeing and loneliness was weakened by BRISC (See Figure 6.9, labelled "Moderating Effect 2"). From the moderation plot, as BRISC changes from lower to higher, the slope of the relationship between perceived financial wellbeing and loneliness increases. This suggests that, for the same lower level of perceived financial wellbeing, BRISC makes loneliness worse. That is, the higher the level of BRISC individuals experience tends to increase

their loneliness when they are less financially well off. However, when individuals perceive themselves to be well off financially, the level of BRISC arising from SNSs use does not seem to have an impact on loneliness. The use of SNSs may worsen the issue of loneliness for those that have a higher level of online social connections and lesser financial means, as they are able to compare themselves to others. SNSs enable individuals to compare their lives to others, which highlights their deficits, such as lack of funds to socialize or not being able to afford to visit those far away.

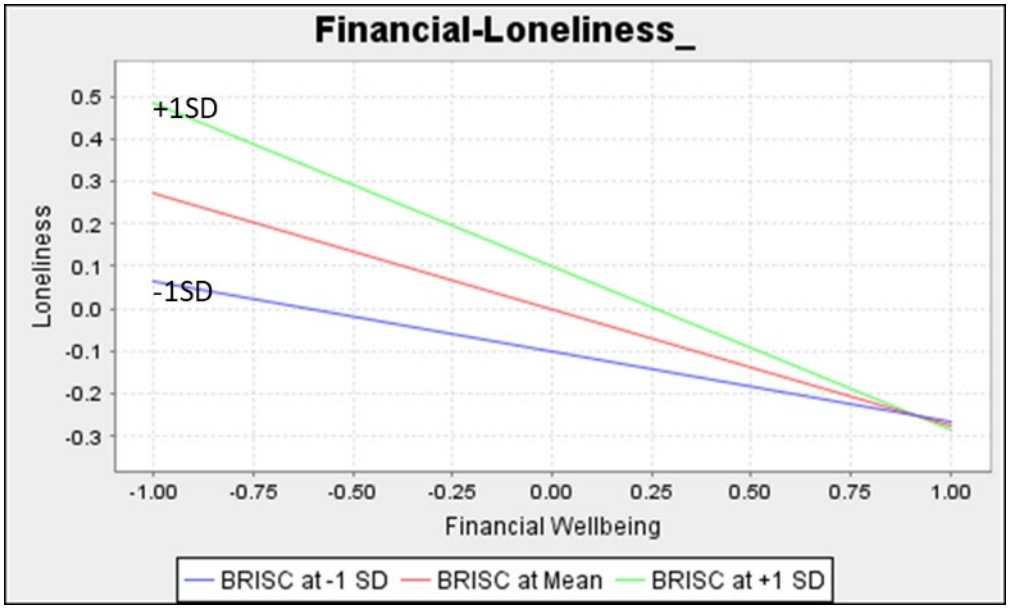


Figure 6.9: BOSC Moderating on the relationship between Perceived Financial Well-being and Loneliness

The third and final relationship that was examined is the effect that BOSC and BRISC have on satisfaction with offline relationships and loneliness. BRISC was found to moderate the

relationship, but BOSC had no moderating effects on the relationship (See Figure 6.2). A moderation plot was created to demonstrate the phenomena (See Figure 6.10, labelled "Moderation Effect 3"). In the figure, as BRISC changes from low to high, the slope of the line representing the relationship between satisfaction with offline relationships and loneliness increases. This implies that loneliness for lower levels of satisfaction with offline relationships is influenced more heavily by BRISC. That is, the higher the level of BRISC an individual has, along with a lower level of satisfaction with offline relationships, reduces loneliness.

The explanation of this result is that BRISC tends to affect individuals to a greater extent if they are not satisfied with their relationships offline. Higher levels of BRISC tend to reduce loneliness more for those with low satisfaction with real world relationships. Individuals that have lower levels of BRISC resulting from SNS use tend to be lonelier when they are not satisfied with real world relationships. This finding indicates that using SNSs to increase weak social connections when real world relationships are not satisfactory to the individual may decrease loneliness for them.

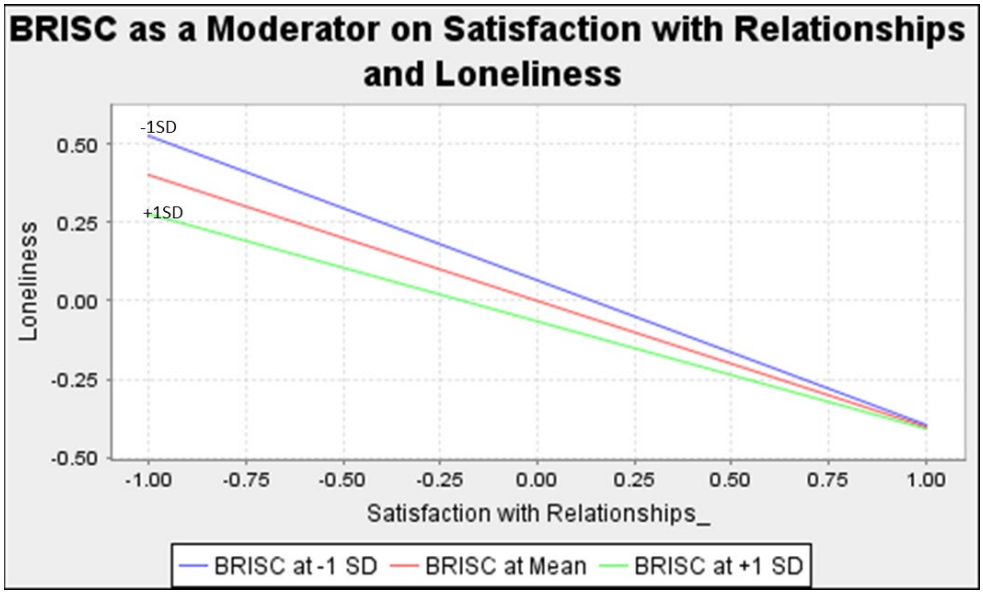


Figure 6.10: BRISC as a Moderator on the relationship between Satisfaction with offline Relationships and Loneliness

6.5 Evaluation of model validity

Evaluation of the structural validity of the model used R^2 goodness of fit measurements of the individual constructs. The R^2 of model constructs ranged from 0.247 to 0.546, with the adjusted R^2 ranging in value from 0.236 to 0.541 (See Table 6.2). These levels of R^2 are seen as weak to moderate in predictive accuracy (Hair, Ringle, & Sarstedt, 2011). This suggests that the three constructs loneliness, BRISC and BOSC perform well in this model.

Table 6.2: R^2 Measures

		R^2 Adjusted
BOSC	0.428	0.420
BRISC	0.546	0.541
Loneliness	0.247	0.236

Several other measures were used to assess the goodness of fit of the model (See Table 6.3). First is the standardized root mean square residual (SRMR), which should be below 0.08 for a good model fit. The model has an SRMR value of 0.042 suggesting that it is a good fit (Hu & Bentler, 1998). Second, the model had a normed fixed index (NFI) 0.767. This is under the suggested upper limit of 0.90, for a good model (Bentler & Bonett, 1980). Third, exact model fit tests were assessed, using D-ULS and DG1. Both of these test the statistical inference of the difference between the empirical and implied covariance matrixes for the model, to determine if model fit is good (Dijkstra & Henseler, 2015). D-ULS and D-G1 were examined using the original values of the measures and the 95% upper bound of the confidence interval the measurement is below the upper bound of the confidence interval (Dijkstra & Henseler, 2015) . This also suggests that the model is a good fit.

The three methods that were used to examine the full model goodness of fit included VIFs of the individual measurements, R^2 of the constructs, SRMR, and NFI. All the methods concluded that the model is a good fit.

Table 6.3: Model Fit Tests

Model 1	Original value	Upper bound confidence interval 95%	
d-ULS	1.679	1.966	Accept
d-G1	1.323	1.518	Accept
	Original value	**Fit Indices**	
SRMR	0.042	<0.08	Accept
NFI	0.767	<0.90	Accept

6.6 *Analysis of the Impact of Control Variables*

In addition to the measurement items included in the model, measurement items for control variables were included in the survey. The control variables were analyzed to control for their influence on the endogenous constructs in the model. Four control variables were analyzed; gender, age, level of education and marital status. Each of the variables was added to the model individually to assess their influence. The results (see Table 6.4), showed that none of the control variables had significant influence on the exogenous variables, and did not alter the hypothesis conclusions for this study.

Table 6.4: Control Variable Analysis

Control Variable	Exogenous construct	Path Coefficient	Significance
Age	BOSC	-0.019	n.s.
	BRISC	-0.005	n.s.
	Loneliness	0.029	n.s.
Education	BOSC	-0.019	n.s.
	BRISC	0.036	n.s.
	Loneliness	0.070	n.s.
Gender	BOSC	-0.052	n.s.
	BRISC	-0.095	n.s.
	Loneliness	0.080	n.s.
Marital Status	BOSC	-0.109	n.s.
	BRISC	0.036	n.s.
	Loneliness	0.070	n.s.

7. Analysis of the Qualitative Study

In this chapter, the results of the qualitative questions from the survey are discussed. First, each question is analyzed separately.

The questions were individually analyzed in Nvivo. I first analyzed and coded the different themes by the users with some of these themes being subdivided during further examination. The statements made by the individual participants were coded using the steps outlined below. In coding the statements of the individuals into themes, each specific question was used to aid in the creation of the themes, thus framing the context in which the various themes were created.

The first step in the analysis process was to read all the participant statements to give myself a general understanding of the information, and time to reflect on the data overall (Creswell, 2014). The next step was to load the qualitative data file into Nvivo. Each qualitative question from the survey was then analyzed and coded individually. The word cloud and word tree were used to find which words were used frequently and to identify possible themes. The iterative process of coding and recoding the data followed. The first coding was basic, beginning with codes and creating definitions for the codes. In the next few passes through the data, the codes were modified and adjusted, with some grouped into sub- categories. I stopped the process when I felt that re-analyzing and coding the data revealed no new knowledge and the codes/themes became stagnant. The results were compared with the literature, to find any discrepancies or new knowledge created. The coding of the data into the thematic nodes was validated for reliability by a former PhD student (Graduated

and is a Professor). The validation of the data was first examined to if the codes made sense, then the data was then coded into the different themes. The interrater reliability was at 85% or above for the coding process, suggesting that the coding of the data was reliable, since an interactor reliability of 80% or above had been achieved (McHugh, 2012). The Kappa statistics for Easy to Use, Occupy Time, Voicing Opinion and Reduces Loneliness categories are above 0.4, which suggests moderate agreement, with all others above the 0.6 threshold suggesting substantial agreement (Vierra & Garrett, 2005). The Cohen's Kappa were taken directly from the NVivo output, which calculated the Kappa using the individual characters instead of at the sentence or paragraph level. This form of calculation may decrease the agreement levels between coders (Kim, et al., 2016), which may have reduced the Cohen Kappa for the different categories due to the inherent bias of the calculation.

The results of this analysis are given below, with each of the questions subdivided into the themes found in the coding process.

Table 7.1: Summary of Emergent Themes

*Summary of the 16 segments. * The theme contains subthemes, which are detailed in their appropriate sections. † as this theme contains subthemes, the agreement statistics are presented where the subthemes are articulated. %agg: Percent Agreement.*

	Kappa	**%agg**
Reason For Use	†	†
-Social Relationships	0.7395	85.29
-Connectedness	0.7571	97.14
-Information	0.7538	91.71
-Communication	0.8842	89.48
-Pass the time	0.8962	97.14
-Easy to use	0.4062	99.07
Type of Use		
Entertainment	0.8556	97.47
Informational	0.7184	95.10
Meeting Others	0.8700	99.13
Occupy Time	0.4800	99.52
Relaxation	0.6511	99.88
Sharing	0.9424	99.52
Voicing Opinion	0.5802	99.67
Loneliness Influence		
Reduces	0.5885	90.03
No Influence	0.6414	96.87
Increases	0.6762	98.62

7.1 Why did you want to use SNSs?

Understanding the motivation of why individuals want to use SNSs may give a more complete understanding of the hypothesized results from the quantitative part of the study. The first qualitative question asked of the survey participants was why they wanted to use SNSs. The results of the question are broken down into categories that were found in the analysis of the results, shown in Figure 7.1.

The major reasons for wanting to use SNSs was to maintain or create social connections along with communication and informational purposes. Lampe et al. (2010) found user motivations to participate in online communities similar to the responses in this body of research. It was found that many of the influences for having an SNS account were for social connections, (a sense of belonging, maintaining social connections and social enhancement), and informational, (providing and receiving information) (Lampe et al., 2010). The themes created (See Table 7.1) were similar to the seven themes that Whiting & Williams (2013) outlined, including social interaction, information seeking, passing the time, communication utility and convenience utility. The reasons for use that were not alluded to by the majority of participants were entertainment and relaxation, which were captured in the other theme by a very limited number of participants. However, responses to the second question (see Section 7.3) indicated that individuals use SNSs for all 7 of the themes outlined by Whiting & Williams (2013).

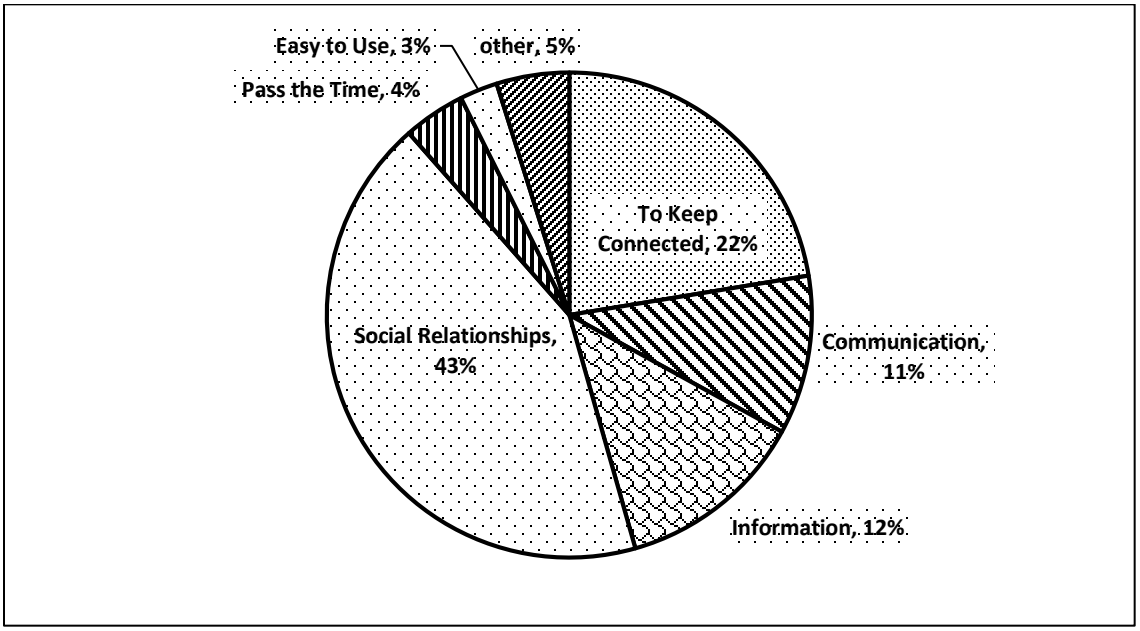


Figure 7.1: Reasons why older adults use SNS

7.1.1 Social Relationships

The main reason for older adults to use SNSs is for social connections. They have found it a way to connect and keep up to date with friends and family. It is also a way to extend their social network by increasing their social connections with former friends, for example high school friends, as well as friending people online that have the same hobbies or interests.

"talk with grand kids"

"Too keep.up with friends that i grew up with high school alumni college alumni"

"use it to find connections with like-minded groups or locate acquaintances that I have lost touch with"

"I spend a lot of time at home alone. I don't drive and so my days of just getting out any time I

want are over. With social networking I can stay in close touch with old friends, family and have made many fast friends with new folks I talk with on the network."

Older adults have also found that family members and friends tend to compel them to use SNSs as an easy way for communication and sharing of material such as pictures and videos.

".. because my kids freak out when i don't"

"to see pictures posted by my daughter of grandkids activities"

"I want my family to know that I am alright, on a day to day basis."

Some older adults have found the medium useful to connect with others and grow their social network.

" *Because I have a lack of real time friends. I have them but I have health issues that tends to slow people down I sometimes feel burdensome. I have a circle of friends on a social network that I stay in touch with. All ages mostly 40 and up."*

7.1.2 Information

Many of the participants stated that they used SNSs for a variety of informational purposes, such as news, current events, popular opinions, information on hobbies and groups. Many wanted to keep current on current news and the different opinions of others, including politics and other topics. They were also able to use SNSs to discover the opinions of others they knew and those individuals they did not know.

"Stay current with news and opinions being discussed. Get info on topics of interests"

Others began using SNSs to keep informed on the happenings of those individuals they knew, such as family and friends.

"*To stay informed of what family and friends are doing."*

Others use SNSs to increase their knowledge about specific subjects such as hobbies. Others might want to learn about the world around them in general and new topics about which they have little knowledge. The use of SNSs for informational purposes suggests that older adults use the medium as a source of information for various subject areas.

7.1.3 Communication

Many of the reasons older adults utilize SNSs is for communication with those they are connected to socially. Others have found that they can communicate with others that have the same interests or issues.

"Considering busy work schedules of my family, I find social networking a good way to communicate at any time and read later."

"To connect with people that have similar interests and political positions."

7.1.4 Connect

Older adults use SNSs to keep connected with individuals that they know. Some state that it aids in keeping connected to those that are geographically distant.

"keep connected with people far away. Family and Friends"

"Keeps me in contact with friend's around the world"

7.1.5 Re-connect to people

Older adults have also found the medium a vehicle to reconnect with individuals from their past, such as former classmates.

" I have a few colleagues that I worked with before I retired that I message frequently and we

arrange to eat together at times. I am part of my high school group that is arranging a class reunion next spring that I keep up with"

7.1.6 Pass the Time

SNSs have also been found useful just to occupy an individual's time. Some say it is used when they are not engaged in other activities. While others suggest that it is a way in which to reduce the amount of time that they spend alone with nothing else to do.

"it can fill up my down time during the day"

"pass the time. to chat,"

"kill time while my wife is in the hospital now 5 1/2 years +"

7.2 What other factors may affect your use of SNSs?

For this question, it was found that individuals tended to give answers as to why they used SNSs or as to why they did not want to use the medium as well as discussing how they utilized the medium. Therefore, the factors affecting the use of SNSs has been broken down into three further categories: reasons for use, reasons for non-use, and types of use.

7.2.1 Factors Affecting Use

The reasons many older adults use SNSs are very similar to the reasons given for why they want to use SNSs, from question 1 above, and discussed in the previous section (7.1). Further reasons for use brought forth here were due to geographical distance between themselves and others, along with mobility and health issues that reduced their ability to connect with others face-to-face.

Geographical distance was stated to be a reason for using SNSs by 20 different participants.

"When traveling or away from home we can stay connected with grandkids. Nice to be able to see and chat with them."

"I can have friends and acquaintances for online discussions without having relationships requiring my physical presence"

Health and mobility issues was the reason seven of the participants used SNSs. Different individuals stated that poor health or decreased mobility limited their face-to-face social connections, so they used SNSs as a substitute for social interactions.

"I can't walk very well only with a walker so its harder for me to go see my friends and family who live off."

"By exchanging thoughts of the activities going on in our nation, it is like sitting with friends discussing ideas right here on my sofa. Marvelous outlet for those of us who live alone and somewhat confined, alone, in the house."

Older adults also stated they had several reasons for not wanting to use SNSs although they did use them. The number one issue that older adults found as a drawback to using SNSs was privacy and security, stated by 21 participants. In contrast, two participants stated that the privacy and security of SNSs was one of the reasons they used them.

"I do not use these fora for serious communication. Once a connection is established, I communicate with Email, WhatsApp, etc. which are much more exclusive and private"

"they aren't private, I only put up what's public"

"trust that my and others information will be miss used, it happens every day with other big business"

Another drawback to using SNSs for the 21 participants was the types of communication and information that was shared on SNSs. Some stated that they experienced information overload from the information some of their friends created. It was suggested that some individuals posted everything on SNSs, which was too much for some of the users.

"I FEEL THAT I DO NOT NEED TO KNOW THE CONSTANT BACK AND FORTH EXPLANATIONS OF WHAT PEOPLE ARE DOING ALL THE TIME. I HAVE FAR BETTER THINGS TO DO."

While some find the amount of controversy and discourse to be a turnoff to using SNSs.

"social networking is somewhat new to me so I am amazed at some of the content on social media. Just can't believe all the hate on there."

"No harmonious discussions, always negative"

Three participants indicated that they feel SNSs are addictive in nature and are therefore hesitant to use SNSs. Another indicated difficulties when the Internet is down. Two different participants stated that they were less willing to use SNSs, as the quantity of connections was limited.

7.2.3 Type of Use

Many participants responded to the type of use of SNSs question as for informational or entertainment purposes. Figure 7.2 shows the different reasons for using SNSs (the percentages do not equal 100%, as they represent the number of participants that use SNS in that way). The type of use stated by the participants suggests that they utilize the medium for the same reason as other segments of the population such as entertainment, information, to occupy time and relaxation (Whiting & Williams, 2013).

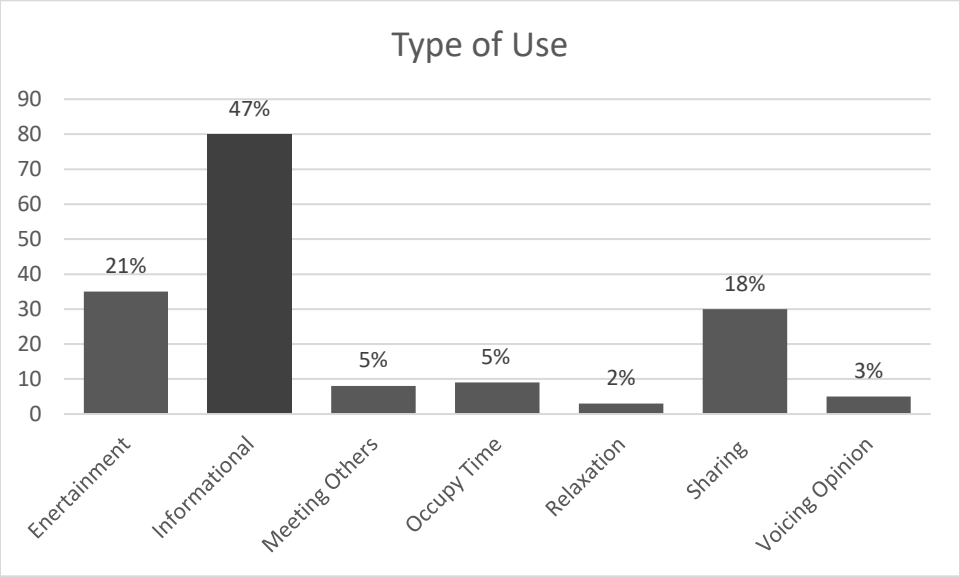


Figure 7.2 Types of SNS Use

6.7 *Entertainment*

Older adults that stated they use SNSs for entertainment found entertainment value in consuming material created by others in the form of posts, photos and videos. Others found entertainment in the online games and quizzes that populate some SNSs.

"I enjoy the iq and personality tests.
I love the cute pet videos."

"I can quickly be entertained by the postings of others…"

"It is entertaining to read different peoples comments about various subjects, especially politics!"

"I like some of the games they have"

6.8 *Informational*

As in the first question asked of older adults, the ability to garner information was a push to utilize this online medium. It was still a strong aspect of use after adoption. Participants generally have a wide range of information that they can receive using SNSs, from finding meeting times to seeking out information on health issues. Others are more general on their search of information, for example, in just learning new things or receiving local or global news. The information sought is from many sources and on many different topics, depending on the individual user. Others use SNS as a tool for information that they need to keep but which they do not always remember, such as birthdays and other special occasions.

"I also use them to find out about meetings, other events (clubs, political events, church activities, local music, art, theater), see local restaurant reviews."

"helps remember birthdays (sometimes)"

"Medical questions.
Finding new doctors.
I like to read doctor reviews before making my choice."

"Learning things"

"World news. Political happenings both domestic and foreign"

"getting news"

'I can catch up on the worlds insanity'

6.9 *Meeting Others*

Older adults have found the use of SNSs useful to meet others, thereby increasing their social connections. However, only 5%, 8 of the 330, respondents use SNS to meet others.

"I am 72 years old. I have never married or had children. Most of my family is deceased. I have very few persons in my life. Socially, I am isolated. Social networking has allowed me to reconnect with persons from my past and to make new friends."

"Provides opportunity to expand my connections to more people"

6.10 Occupying time

The reason some older adults began to use SNSs was to occupy their time. Some have found it to be a method to "kill" time. Yet others are limited in their use of this medium due to time constraints.

"It depends, when I have a little time I might take a quick peek to see what is being posted. Other times, when I have more time I might spend as much as half an hour perusing the feed"

"It breaks up the day."

"I would have a lot of idle time if not for social networking."

"kill time"

6.11 Relaxation

Only three of the respondents stated that they use SNSs to relax.

"Take time out to relax."

6.12 Sharing

Older adults may use SNSs to share aspects of their lives, their knowledge, and different material that they have collected over the years, such as recipes. Some also use SNSs to share with others and have others share with them, ranging all the way from information to actual physical goods.

"I can send and receive pictures to my friends and family"

"Sharing information on issues, projects and news with people who will share with others"

"I belong to groups that help me locate items I would like or a home for items that I no longer need"

6.13 Voicing opinions

A small number of participants stated that they like to use SNSs to exchange views on particular subjects. Some indicated that they feel that they may be heard by others, and some stated that they feel that there is always someone that will listen to them.

"I belong to groups that help me locate items I would like or a home for items that I no longer need"

"There is always someone that will listen to you."

SNSs is used by older adults for many different reasons. Some use them for entertainment, information or sharing, while others use them to expand their social networks or as a way to spend time.

7.3 Do you think SNSs helps or does not help loneliness?

SNS effects on loneliness are perceived best by the user. That is, their perceptions of effect on loneliness of themselves and others is examined best through the lens of users. According to various users, the use of SNSs can increase, decrease or be ineffectual in its effects on user loneliness. Of the 240 users who made statements regarding SNS impacts on loneliness, eighteen stated that use of SNSs could or does make loneliness worse. A further 65 stated that it has no effect and 157 responses stated that it did help in reducing loneliness for themselves or others.

7.3.1 Helps to Reduce Loneliness

Of the 157 comments that stated SNS use can help to reduce loneliness, 92 (38%), felt that SNSs helped reduce their loneliness while 65 (27%) suggested that it could reduce loneliness for others.

Those that felt that SNSs helped reduce loneliness gave many reasons for its influence over loneliness. For example, it gave them the ability to connect with others in a different manner then face-to-face. The use of SNSs was often suggested as a substitute to socialization outside of the home for those unable to get out due to disability, financial issues or large distances between loved ones and close friends.

"Yes. Not enough face to face contact, so online contact helps greatly. Winter is long, harsh and very isolating. Online friends make it tolerable. No family...without social networks, I am much too alone."

"Sometimes, elders and disabled people find it difficult to actively socialize outside of home, so social media helps reduce the feeling of isolation."

"it helps loneliness where you may thousand miles away from your best friends"

"Help. Stay in better contact when there is distance between you"

Others stated that the medium helps reduce loneliness, although they may still feel a lack of connection with others.

"social networking sites does help in some ways to reduce my loneliness. It does not help as far as every day feeling so alone. I don't have any local friends and it's tough because I don't drive and have to rely on others to take me shopping, etc. It's been tough since my husband died three years ago. We had such a good relationship and went every where together. I don't have that same life anymore. I have to live with my daughter and her husband so I lack being on my own."

Some participants suggested that SNS increases social connections either by making new ones or reconnecting with people from their past.

"I have met new persons on line.
I am alone and have very few persons in my life off line but on line, there are many persons in my life even though it is somewhat superficial. Without social networking, I would be horribly isolated. With social networking, I am not so alone. I am not so afraid."

"helps connecting to friends who live away and review old times"

Some participants stated that SNS use might reduce loneliness for themselves or for others by giving the individual something to do. The reason given is that individuals find themselves occupied and focus less on their lack of real world social activities.

"When I am alone, which is often, it helps me feel less isolated if there were problems to know I have a whole community of connections I could reach with one button"

"Yes it helps as it takes my mind off of other things. I enjoy conversations with family & friends"

"Yes...lots of heartwarming articles
Lot of fun things posted
Many distractions to help keep your mind away from loneliness"

7.3.2 No effect on Loneliness

65 (27%) of the participants stated that the medium does not increase or decrease loneliness for themselves or others.

"Sometimes they help with loneliness but for the most part I don't think they are a real factor whether someone feels lonely or not. Loneliness is not going to be solved by going to a social network site."

"no because you are still alone and just using a computer"

"It has nothing to do with loneliness"

"for those who are far from family and friends it is a nice way to stay in touch, but the relationship needs more than social networking"

"speaking for myself, it does not overall reduce loneliness"

7.3.3 Make loneliness worse

18 (7.5% of participants) stated that SNS use increases loneliness. Eight (3.3%) indicated that it made them lonelier. 10 (4.1%) suggested that it makes others lonelier. Some suggested reasons why SNS use made loneliness worse, due to comparisons with others such as "keeping up with the Jones" ("Keeping up with the Jones" is a phrase that implies that individuals benchmark themselves with others according to socioeconomic standing or cultural inferiority). Others suggested that the use of SNSs can highlight areas in which users are lacking and cause them emotional distress due to the lack of social connections offline or online as well as being less well-off financially.

"think it makes you feel more lonely because you cannot keep up with the Jonses"

The medium can be more isolating, when messages that do not receive a response can have the effect of causing more isolation.

"no, if anything it could cause a person that is too dependent on social networking to feel more alone when they are not in touch with their friends on social networking"

"If a loved one or friend doesn't respond, it can add to the problem of isolation and disconnect."

Finally, the use of SNSs is not seen as a substitute for offline interactions with others and can be the cause of further isolation and loneliness.

"I think they're more isolating than anything"

"no because human interaction is the best way to connect with people."

"If you rely on it as your only way to communicate. you will isolate yourself and be very lonely"

"it is of concern if it's used to entirely reduce loneliness ... there needs to be some face-to-face contact for that "

"Does not help me when I feel lonely. It seems impersonal to me. I find more warmth and comfort hearing a voice on the telephone or an in person visit. Social media is much like TV"

While others just stated it makes loneliness worse but provided no explanation.

"I think they're more isolating than anything"

"*Make loneliness worse"*

Responses from those that feel that SNSs can increase loneliness, indicate that it can increase feelings of social isolation and loneliness for individuals. The reasons range from comparing your life to others and finding it is lacking, or that this medium is not able to replace face-to-face interaction with others. A study by Primack et al. (2017) also suggests that social media can have a social isolation effect. In their study, they suggest three reasons for this, which our participants also mentioned. The first is that the use of SNSs is a weak replacement for a more "authentic social experience" or face-to-face interaction. Secondly, certain aspects of the medium facilitate exclusion, with individuals realizing that their lives are lacking in social connections or they were not included in various events, with the result that the individual will feel more socially isolated and lonely. The third reason is that others curate their images on social media significantly, presenting only the highly idealized aspects of their lives. This idealized version of others may lead

to envy and the distorted belief that others live much more successful and happy lives than their own (Primack et al., 2017).

8. Discussion and Implications

In this chapter, the empirical and qualitative findings of this research will be discussed in further detail. In addition, the theoretical and practical additions this thesis makes to the current literature will be discussed.

The empirical model used for this thesis examined the influence of SNSs on social connections in the form of social capital. I also investigated the impact that social capital, created online, has on loneliness of older adults. The usage of SNSs was broken down into different facets of use, to give a better understanding of its effect on social capital of older adults. Two types of social connections were examined: those that older adults were emotionally close to and those that older adults were not, in the form of BOSC and BRISC respectively.

The use of SNSs to extend and enhance social connections was found to be helpful. However, the way in which older adults interact with SNSs influences whether social connections are increased or just maintained. The more actively SNSs is used, the more the relationship between friends is increased and nurtured. Yet, the amount of usage of SNSs does not positively influence connections within families. This suggests that the bond between those emotionally close to older adults is not nurtured by the amount of contact, but possibly the quality of the contact.

The number and type of contacts older adults have through SNSs does seem to increase the number of their social connections. The fact that the number or type of contact influence is felt on both BOSC and BRISC adds to the previous literature that has found that the extent of one's online

connections is a predictor for the social capital of individuals (Damant, et al., 2016). The number and type of connections older adults have also influences social capital. When further examining contact breadth it was noticed that over 90% of the participants had family and friends as part of their connections in SNSs. When asked why the participants started using SNSs, many stated it was to keep connected or for social relationships. This composition of contacts suggests that older adults are using SNSs due to the BOSC that they already have, yet once they are online they tend to increase both BOSC and BRISC.

Message content in both private and public information was found to affect the form of social connections for older adults. Informational content in the message has a positive influence on weak connections (BRISC). This would be expected as these types of connections are used mainly for informational purposes. But messages with informational content were found to have no effect on the social capital older adults have through their close connections. The impact of informational content on close relationships may differ since such relationships are mainly for emotional support. Yet the sharing of information in close relationships may be an expectation that would have a negative impact on the relationship if it were withheld.

Messages containing private information were found to impact positively on only closely tied relationships. The hypothesized relationship between private information content and BRISC was expected to have a negative influence, whereas the relationship was found to be non-significant.

To increase the social connections of older adults, they need to actively use the medium, and the type of message content created is dependent on the relationship. The messages sent need to be more of a more personal and private in nature for those with whom the individual is close to. To increase social connections and create new friendships via SNSs older adults should be actively and intensely using SNSs. They need to be willing to share public information with others to create and foster weak tie relationships within SNSs. This can be said in general for older adults.

Although social capital for older adults seems to shield them from loneliness in the real world (de Jong Gierveld et al., 2015), this cannot be said of the social capital created using SNSs. Social capital created using SNSs does not have a direct impact on loneliness, yet its effect is felt indirectly. The increase in social connections with friends and acquaintances online tends to decrease the impact that lower satisfaction with offline relationships has on loneliness. Thus, increasing online social connections for those who lack offline social connections can act as a buffer for feelings of loneliness. Further, the weaker online social connections older adults have, the lonelier they tend to be if they are lacking financially. An increase in weak social connections via SNSs tends to increase feelings of loneliness for those less financially well off. Thus, BRISC can reduce or increase loneliness depending on an older adult's financial circumstances and social connections offline. The way in which weak social connections moderate suggests that SNSs can highlight shortcomings in one's own life, thus increasing feelings of distress, such as loneliness. However, higher levels of BOSC tend to protect older adults from loneliness when they are less satisfied with their offline relationships.

The model created through this research showed that a decrease in loneliness was not generated by the increase in social capital created using SNSs. When participants were asked directly if they felt that SNS use would reduce loneliness, many thought it would. Some stated that it helped them deal with loneliness, and others thought it might help someone else with loneliness. However, a few participants stated that it had no effect on loneliness or even exacerbated loneliness. One participant suggested that SNSs are a good way to keep in touch, although relationships may need more nurturing than is necessary with the use of SNSs. The fact that there was no consensus among participants on whether SNSs reduced or increased loneliness, suggests that there may be other factors beyond the use of SNSs in play. Other studies have looked at the personality types of the participants and their willingness to seek out new relationships as a predictor of the success of the intervention (Correa, Hinsley, & Zuniga , 2010). The findings by Primack et al. (2017) suggest that the medium creates deficits either real or perceived for the users of the medium, which can increase feelings of social isolation and loneliness.

The motivation for use of SNSs can help explain some of the findings in this study. As many of the older adults have adopted SNSs to keep connected or maintain social connections, this may help to explain why increases in social capital did not reduce loneliness. The use of SNSs might be a substitute for another form of communication, thus increasing social capital to a degree, yet not feeling its influence through some psychological phenomena. When we further examined the type of connections, only 2.4% of the participants stated that they used SNSs to meet others, so that the contact breadth did not have the significant affect on BRISC that might be expected. Considering the types of connections from the questionnaire, 16% of the participants had strangers

as part of their connections, along with 37% that had new friends. Thus, participants who suggested that did not go online to meet others seems strange, since the very nature of SNSs facilitates the extension of one's social circle.

The reasons to use SNSs include social relationships, and information and communication purposes, which are the building blocks of Social Capital. Consequently, the very use of SNSs should increase Social Capital of the participants. This can be seen from the relationship between active use and social capital (BOSC and BRISC).

Theoretical implications

This paper makes several theoretical contributions. First, as the model extends the use of SNSs into several dimensions, this allows researchers a more complete view of how SNSs and social media are used. These extensions enable a more complete picture of individual interactions with SNSs. The previous literature on the use of SNSs and/or social media focused more on an examination of their use of SNSs, including the amount of use and the contact breadth (Ellison et al., 2007; Kietzman et al., 2011).

This paper further enriched social capital theory by investigating how the use of SNSs can enhance social capital along different dimensions. Several different dimensions of the use of SNSs were identified and their impacts on different types of social capital were tested. This research further expands the understanding of how older adults utilize media, as well as its influence over social capital. The model created through this research has also contributed to the further understanding of the mechanisms of SNS use that underlie their impact on cyber social capital.

This may contributed to an understanding of how the use of SNSs influences other forms of psychological wellbeing.

Furthermore, the study has shown that the nuances of SNS use may or may not influence the social capital of an individual. This gives a compelling reason for the contradictory results that have been found previously, with some studies showing increases in social capital, while others have found decreases or no effect (Quinn, 2016; Blaschke et al., 2009; Damant et al., 2016). The research demonstrates a difference in social capital created in the real world as compared to that created online. That is, the social capital created by older adults off line tends to reduce loneliness, while the social capital created online, using SNSs, has statistically no effect on loneliness. This suggests that the benefit of increasing social capital may depend on how it is created.

This research also investigated the influence of social capital on loneliness, along with other major factors such as financial wellbeing, health and satisfaction with offline relationships. Participant perceptions of their financial wellbeing and health were examined as a subjective measure. Many other studies have measured actual health and financial measurements objectively. Interestingly, this research showed that the results for these measures were similar to results of other studies that used empirical observations, such as how many diseases an individual has. This suggests that participant perceptions of these constructs may help to give a better understanding of them. This is especially the case for groups living in different financial environments where these measures would be easier to compare. Similarly, older adults may register on observable, clinical measures as being less healthy than they perceive, while others are healthy, yet they perceive that

they are not. Clearly, such differences of opinion may influence the results of such studies. My research suggests that the option of a subjective measure or use of a perceived measure for comparison of two constructs is feasible. This ability to use a subjective measure for both health and financial wellbeing would enable researchers to compare diverse populations without needing to compensate for objective differences, since the differences are adjusted through the measurements themselves. This research also validates previous studies in their use of health, financial wellbeing and satisfaction with relationships (offline) and their influence on loneliness. These studies show that social capital has an impact on loneliness, although indirectly.

Another contribution of this work is the finding that social capital created via the use of SNSs did not have a direct influence on loneliness, unlike social capital created offline (de Jong Gierveld et al., 2015). Unlike social capital created offline, that which was created online had an indirect influence on loneliness by moderating the influence of perceived health status, perceived financial wellbeing and satisfaction with offline relationships. This finding indicates that the creation of social capital is not created equally, with cyber social capital being a weak substitute for social capital created and maintained offline. This may be dependent on the different demographic characteristics of a group.

Further, the qualitative analysis gave a good insight on why older adults use SNSs and how they think the use of SNSs affects their perceived loneliness. It also explains why previous statistical studies on the impact of SNS on loneliness were inconclusive.

Implications for practice

The practical implications of this study are of importance to individuals and organizations that work to improve the social life of older adults. The study has yielded a greater understanding of how the different dimensions of SNS use can influence social capital of older adults. This knowledge can be used to understand the nuances of how older adults should be using SNSs to maintain and expand social connections. It will also help those teaching and creating programs for older adults about utilizing SNSs in the most effective ways. This study also shows the limitations that SNS use has on helping older adults maintain, extend or enhance social relationships. Furthermore, this study supported the findings of other research on the reasons older adults and other age groups use SNSs and how they actually use this medium.

Conclusions, Limitations and Future Research

The research in this thesis has some limitations. The sample was conducted using an online survey service, so some groups of individual opinions may not be included. The survey population of older adults lived on their own or with family. Older adults living in retirement homes and assisted living situations were not included in this study. Those living in assisted living situations or long-term care facilities might find the impact of SNSs use on social capital to be different and the effects of this on social capital might influence loneliness. Further study is needed to include this portion of the population.

A further issue with the research is that the sample population used was not divided into different segments of lonely and non-lonely. As the whole sample population, was used to

understand how the impact of use of SNSs indirectly influenced loneliness via social capital. To understand the influence the medium has on loneliness for the portion of the population defined as lonely, this portion of the sample should be used to determine if the use of SNSs influences loneliness.

The research investigated some of the demographic distinctions for older adults, such as age, marital status, gender and education. However, the individual categories in the demographics were not examined to gain further understanding of individual differences when utilizing SNSs in terms of its influence on social capital and loneliness. Further study is needed to give a better understanding of the types of older adults that would find the most benefit from using SNSs.

The various dimensions of SNSs usage in the other age segments of the population may experience different influences on social capital. The study examined several different facets of SNSs use although there are more that were not incorporated into the model. For instance, older adults with varying health and living conditions that may affect their use of SNSs may experience social capital and psychological wellbeing differently, so that this needs to be investigated.

The survey was limited to Canadian English speaking participants. The language constraint eliminates those that are not fluent in English, so this study may not capture Canada's diverse immigrant population. This segment of the population might be a good candidate for this form of interventions. This is because many immigrants have extended family and friends living elsewhere, so SNSs may allow them to maintain better contact with those that live far away.

As the scope of the research was limited by time and feasibility of the length of the study, other dimensions of use could be examined to determine their impact on social capital. For

example, the study examined active use of SNSs, with participants interacting with each other. Many of the participants stated that they used SNSs for passive activities, such as playing games, reading the news, looking at pictures, etc. Examining the impact of passive use could be an informative extension of the different facets of use of SNSs to study.

The model examined the influence of the use of SNSs on creation of online social capital and the impact that it had on loneliness. The thesis examined the indirect effect of the use of SNSs on loneliness, and not the direct effect. Such that the direct influence of SNSs use on loneliness should be examined in future research.

The results of the study show that older adults using SNSs can increase both their BOSC and BRISC. The different facets of SNS use have varying influences over the two types of social capital, although usage of SNSs can increase both BOSC and BRISC. This increase in the social capital due to SNSs use does not have a significant impact on loneliness. Loneliness is influenced by perceived health status, perceived financial wellbeing and satisfaction with offline relationships. The increase in social capital from online use moderates the impact of perceived health status, perceived financial wellbeing and satisfaction with offline relationships on loneliness in different directions. I.e. social capital enhances the negative impact of low financial wellbeing on loneliness but reduces the negative impact on loneliness of low satisfaction with offline relationships,

9. Bibliography

Agarwal, R., & Venkatesh, V. (2002). Assessing a Firm's Web Presence: A Heuristic Evaluation Procedure for the Measurement of Usability. *Information Systems Research*, 168-186.

Allen, M. K. (2013, January). *Consumption of culture by older*. Retrieved from Statisitics Canada: http://www.statcan.gc.ca/pub/75-006-x/2013001/article/11768-eng.pdf

Anderson, L. (1998). Loneliness Research and Interventions: A Review of the Literature. *Aging & Mental Health*, 264-274.

Antheunis, M., Vanden Abeele, M., & Kanters, S. (2015). The Impact of Facebook Use on Micro-Level Social capital: A Synthesis. *Societies*, 399-419.

Appel, H., Gerlach, A., & Crusius, J. (2016). The Interplay Between Facebook Use, Social Comparison, Envy and Depression. *Current Opinion fo Psychology, 9*, 44-49.

Arnold, N., & Paulus, T. (2010). Using a Social Networking Site for Experiential Learning: Appropriate, Lurking and Modeling and Community Building. *Internet and Higher Education*, 188-196.

Baernholdt, M., Hinton, I., Yan, G., Rose, K., & Mattos, M. (2012). Factors Associated with Quality of Life in Older Adults in the United States. *Quality of Life Research, 21*, 527-534.

Bagozzi, R., Yi, Y., & Philips, L. (1991). Assessing Construct Validity in Organizational Research. *Administrative Science Quarterly, 36*(3), 421-458.

Barg, F., Huss-Ashmore, R., Wittink, M., Murray, G., Bogner, H., & Gallo, J. (2006). A Mixed-Methods Approach to Understnading Loneliness and Depression in Older Adults. *Jornoal of Gerontology, 61B*(6), 5329-5399.

Bazarova, N. (2012). Public Intimacy: Discolsure Interpretation and Social Judgements on Facebook. *Journal of Communication*, 815-832.

Beer, D. (2008). Social network(ing) sites...revisting the story so far: A response to Danah Boyd & Nicole Ellison. *Journal of Coputer-Mediated Communication*, 516-529.

Bekhet, A. K., Zauszniewski, J., & Nakhla, W. (2008). Loneliness: A concept Analysis. *Nursing Forum*, 207-213.

Bentler, P., & Bonett, D. (1980). Significance Tests and Goodness of Fit in the Analysis of Covariance Structures. *Psychological Bulletin*, 588-600.

Bhattacherjee, A. (2001a). An empirical Analysis of the Antecedents of Electronic Commerce Service Continuance. *Decision Support Sysems*, 201-214.

Blaschke, C., Freddolino, P., & Mullen, E. (2009). Ageing and Technology: A Review of the Research Literature. *British Journal of Social Work*, 641-656.

Blit-Cohen, E., & Litwin, H. (2004). Elder Participation in Cyberspace: A Qualtitative Analysis of Israeli Retirees. *Journal of Aging Studies, 18*, 385-398.

Bolen, K., & Lennox, R. (1991). Conventional Wisdom on Measurement: A Structural Equation Perspective. *Psychology Bulletin*, 305-314.

Bowden, A., Fox-Rushby, J., Nyandieka, L., & Wanjau, J. (2002). Methods for Pre-Testing and Piloting Survey Questions: Illustrations from the KENQOL Survey of Health-Related Qualtiy of Life. *Health Policy and Planning*, 23-25.

Bowling, A., & Gabriel, Z. (2004). An Integrational Modle of Quality of Life in Older Age. Results from the ESRC/MRC/HSRC Quality of Life Survey in Britain. *Social Indicators Research, 69*(1), 1-36.

Boyd, D. M., & Ellison, N. B. (2008). Social Network sites: Definition, History, and Scholoarship. *Journal of Computer Mediatied Communication*.

Brahama, S. (2009). Assessment of Construct Validity in Mangaement Reserach. *Jornal of Mangement Research, 9*(2), 59-71.

Brandtzaeg, P. B., & Heim, J. (2009). Why People Use Social Networking Sites. *Online Communities and Social Computing 3rd Annual.* San Diego.

Burger, J. M. (1995). Individual Differences in Preference for Solitude. *Journal of Research in Personality*, 85-108.

Burke, M., & Kruat, R. (2014). Growing Closer on Facebook: Changes in Tie Strenght Through Social Network Site Use. *CHI*, (pp. 4187-4196). Toronto.

Burke, M., Marlow, C., & Lento, T. (2010). Social Network Activiity and Social Wllbeing. *CHI 2010 (Conference of Human Factors in Computing Systems).* Atlanta: ACM.

Buttler, S. (2006). Evaluating the Senior Companion Program: A Mixed-Method Approach. *Journl of Gerontological Social Work*, 45-70.

Cacioppo, J., & Hawkley, L. (2009). Loneliness. In M. Leary, & R. Hoyle, *Handbook of Individual Differences in Social Behavour* (pp. 227-239). New York: Guilford.

Cattan, M., White, M., Bond, J., & Learmouth, A. (2005). Preventing Social Isolation and Loneliness Among Older People: A Systematic Review of Health Promotion Interventions. *Ageing & Society*, 41-67.

Chaffey, D. (2017, Feb 27). *Global Social Media Research Summary.* Retrieved from Smart Insights: http://www.smartinsights.com/social-media-marketing/social-media-strategy/new-global-social-media-research/

Chen, Y.-R. R., & Schulz, P. (2016). The Effect of Information Communication Technology Interventions on Reducing Social Isolation in the Elderly: A Systematic Review. *Jornal of Medical Internet Research*, 1-11.

Chin, W. (2010). How to write Up and Report PLS Analyses. In V. E. al., *Handbook of Partial Least Squares* (pp. 655-690). Berlin Heidelberg: Springer-Verlag.

Chiu, C.-J., Hu, Y.-H., Lin, D.-C., Chang, F.-Y., Chang, C.-S., & Lai, C.-F. (2016). The Attitudes, Impact and Learning Needs of Older Adults Using Apps on Touchscreen Mobile Devices: Results from a Piolt Study. *Computers in Human Behavior*, 189-197.

Chonody, J., & Wang, D. (2013). Connecting Older Adults to the Community Through Multimedia: An Intergernerational Reminiscience Program. *Activites, Adaption & Aging*, 79-93.

Coleman, J. (1988). Social Capital in the Creation of Human Capital . *American Journal of Sociology*, S95-S120.

Coll-Planes, L. (2016). Promoting Social Capital in an Ageing Society: A Win-Win Proposition? *GAC Saint, 30*(5), 323-325.

Correa, T., Hinsley, A. W., & Zuniga , H. (2010). Who Interacts on the Web? The Intersection of Users' Personalilty and Social Media Use. *Computers in Human Behavour, 26*, 247-253.

Cotten, S., Anderson, W., & McCullough, B. M. (2013). Impact of Internet Use on Loneliness and Contact with Others Among Older Adults: Cross-Sectional Analysis. *Journal of Medical Internet Research*.

Creswell, J. (2014). *Research Design: Qualitative, Quantitative and Mixed Methods Approaches 4th edition.* Thousand Oaks: Sage.

Cronbach, L. (1951). Coefficient Alpha and the Internal Structure of Tests. *Psychometika, 16*(3), 297-334.

Damant, J., Knapp, M., Freddolino, P., & Lombard, D. (2016). Effects of Digital Engagement on the Qualtiy of lIfe of Older People. *Health and Social Care in the Community*, 1-25.

de Jong Gierveld, J., & Van Tilburg, T. (2006). A six-item scale for overall, emotional and social loneliness: confirmation tests on new survey data. *Research on Aging*, 528-598.

de Jong Gierveld, J., Keating, N., & Fast, J. E. (2015). Determinants of Loneliness among Older Adults in Canada. *Canadian Journal on Aging*, 125-136.

Deters, F., & Mehl, M. (2012). Does Posting Facebook Status Updates Increase of Decrease Loneliness: An Online Social Networking Experiment. *Social Psychological and Personality Science*, 1-8.

Detrixhe, J. J., Samstag, L. W., & Penn, L. (2014). A Lonely Idea: Solitude's Separation form Psychological Research and Theory. *Contemporary Psychoanalysis*, 310-331.

Dijkstra, T., & Henseler, J. (2015). Consisten and Asymptotically Normal PLS Estimators for Linear Structural Equations. *Computational Statistics and Data Analysis*, 10-23.

Dysktra, P. A., & de Jong-Gierveld, J. (2004). Gender and Marital-History Differences in Emotional and Social Loneliness among Dutch Older Adults. *Canadian Journal on Aging*, 141-155.

Ellison, N. B., Lampe, C., & Steinfield, C. (2009). Social Network Sites and Society: Current Trends and Future Possibilities. *Interactions*, 6-9.

Ellison, N., Steinfield, C., & Lampe, C. (2007). The Benefits of Facebook "Friends:" Social Capital and College Students' Use of Online Social Network Sites. *Journal of Computer-Mediated Communication*, 1143-1168.

Erickson, L. (2011). Social Media, Social Capital and Seniors: The Impact fo Facebook on Bonding and Bridging Social Capital of Individuals Over 65. *Seventeenth Americas Conference on Information Systems*, (pp. 1-7). Detroit.

Farquhar, M. (1995). Elderly Peoples's Definition of Quality of Life. *Social Science Medicine*, 1439-1446.

Fokkema, T., & Knipscheer, K. (2007). Escape loneliness by going digital; A quantitative and qualtitative evaluation of a Dutch experiment in using EcT to overcome loneliness among older adults. *Aging & Mental Health*, 496-504.

Friedman, D., Parikh, N., Giunta, N., Fahs, M., & Gallo, W. (2012). The Influence of Neighborhood Factors on the Qualtiy of Life of Older Adults Attending New York City Senior Centers: Results from the Health Indicators Project. *Quality Life Re*, 123-131.

Gabriel, Z., & Bowling, A. (2004). Quality of life from the perspectives of older people. *Aging & Society, 24*, 675-691.

Garson, G. (2012). *Validity.* Asheboro: Statistical Associated Publishing - Blue Book Series.

Gefen, D., & Straub, D. (2005). A Practical Guide to factorial Validity Using PLS- Graph: Tutorial and Annotated Example. *Communicatons fo the Association for Information Systems*, 91-109.

Gefen, D., Staub, D., & Boudreau, M.-C. (2000). Structural Equation Modeling and Regression: Guidelines for Research Practice. *Communications of the Association for Information Systems*, 1-77.

Gilbert, E., & Karahalios, K. (2009). Predicting Tie Strenght with Social Media. *CHI 2009.* Boston: ACM.

Gilmour, H. (2012). *Social Particpation and the Health and Wellbeing of Canadian Seniors.* Retrieved from Statistics Canada: http://www.statcan.gc.ca/pub/82-003-x/2012004/article/11720-eng.pdf

Granovetter, M. (1973). The Strength of Weak Ties. *American Journal of Sociology*, 1360-1380.

Gray, A. (2009). The Social Capital of Older People. *Ageing & Society, 29*(1), 5-31.

Hair, J., Black, w., Babin, B., & Anderson, R. (2010). *Multivariate Data Analysis 7th Edition.* Upper Saddle River, N.J.: Prentice Hall.

Hair, J., Hult, G., Ringle, C., & Sarstedt, M. (2017). *A Primer on Partial Least Squares Structural Equation Modeling (PLS-SEM).* Thousand Oaks: Sage.

Hair, J., Ringle, C., & Sarstedt, M. (2011). PLS-SEM: Indeed the Silver Bullet. *Journal of Marketing Theory and Practice*, 139-151.

Hawkley, L. C., Hughes, M. E., Waite, L. J., Masi, C. M., Thisted, R. A., & Cacioppo, J. T. (2008). From Social Structutral Factors to Perceptions of Relationship Quality and Loneliness: The Chicago Health, Aging and Social Relations Study. *Journal of Gerontology*, 375-384.

Hawkley, L., & Cacioppo, J. (2010). Loneliness Matters: a Theoretical and Empirical Review of Consequences and Mechanisms. *Annual Behaviour Med*.

Hawkley, L., Lavelled, L., Berntson, G., & Cacioppo, J. (2011). Mediators of the Relationship between Sociaoeconomic Status and Allostiatic Load in the Chicago Health, Aging , and Social Relatins Study (CHASRS). *Psychophysiology*, 1134-1145.

Hawthorne, G. (2006). Measuring Social Isolation in Older adults: Development and Initial Validation of the Friendship Scale. *Social Indicators Research*, 521-548.

Hawton, A., Green, C., Dickens, A. P., Richards, S. H., Taylor, R. S., Edwards, R., . . . Campbell, J. L. (2011). The Impact of Social Isolation on the Health Status and Health -Related Quality of Life of Older People. *Qualtiy Life Res*, 57-67.

Heenan, D. (2011). How Local Interventions Can Build Capacity to Address Social Isolation in Dispersed Rural Communities: A Case Study form Northern Ireland. *Aging International*, 475-491.

Henseler, J., Dijkstra, T., Sarstedt, M., Ringle, C., Dimantopoulos, A., Straub, D., . . . Calantone, R. (2014). Common Beliefs and Relality about Partial Least Squares: Comments on Ronkko and Evermann. *Organizational Research Methods*, 182-209.

Henseler, J., Hubona, G., & Ray, P. A. (2016a). Using PLS path modeling in new technology research: updated guidelines. *Industrial Management & Data Systems, 116*(1), 2-20.

Henseler, J., Ringle, C., & Sarstedt, M. (2016). A New Criterion for Assessing Discriminant Validityin Variance0-based Structural Equation Modeling. *Jouranl of the Academy of Marketing Science*, 115-135.

Heo, J., Chun, S., Lee, S., Lee, K., & Kim, J. (2015). Internet Use and Well-Being in Older Adults. *Cyberpsychology, Behavior, and Social Networking*, 268-272.

Horton, D., & Wohl, R. (2006). Mass Communication and Para-Social Interaction: Observations on Intimacy at a Distance. *Particip@ations*.

Hu, L.-t., & Bentler, P. (1998). Fit Indices in Covariance Structure Modeling: Sensitivity to Underparameterized Model Misspecification, . *Psychological Methods*, 424-453.

Hughes, M., Waite, L. J., Hawkley, L. C., & Cacioppo, J. (2004). A Short Scale fo Measuring Loneliness in Large Surveys. *Research on Aging*, 655-672.

International Federation of Aging. (2012, July). *Current and Emerging Issues Facing Older Canadians.* Retrieved from http://www.ifa-fiv.org/wp-content/uploades/2012/curent-and-emerging-issues-facing-older-canadians-final-report-30-march-2012.pdf

Jung, E., & Sundar, S. (2016). Senior Citizens on Facebook: How do they Interact and Why? *Computers in Human Behavior, 61*, 27-35.

Kahlbaugh, P., Speranidio, A., Carlson, A., & Hauselt, J. (2011). Effects of Playing Wii on Well-Being in the Elderly: Physical Activity, Loneliness and Mood. *Activities Adaption & Aging*, 109-113.

Kaplan, A., & Haenlein, M. (2010). Users of the World, Unite! The Challenges and Opportunities of Social Media. *Business Horizons*, 59-68.

Karahasonovic, A., Brandtzaeg, P. B., Heim, J., Luders, M., Vermeir, L., Pierson, J., . . . Jans, G. (2008). Co-Creation and User-Generated Content -Elderly People's User Requirements. *Computers in Human Behavior*.

Khosravi, P., Rezvani, A., & Wiewiora, A. (2016). The Impact of Technology on Older Adults' Social Isolation. *Computers in Human Behavior*, 594-603.

Kim, S.-Y., Graham, S., Ahn, S., Olson, M., Card, D., Kessler, M., . . . Bubacy, F. (2016). Correcting Biased Cohen's Kappa in NVivo. *Communication Methods and Measures, 10*(4), 217-232.

Kim, W., Jeong, O.-R., & Lee, S.-W. (2010). On Social Web Sites. *Information Systems*, 215-236.

Koch, N. (2015). common Method Bias in PLS-SEM: A full collinearity assessment approach. *International Journal of e-Collaboration, 11*(4), 1-10.

Kramer, N., Rosner, L., Eimler, S., Winter , S., & Neubaum, G. (2014). Let the Weakest Link Go! Empirical Explorations on the Relative Importance of Weak and Strong Ties on Social Networking Sites. *Societies*(4), 785-809.

Lampe, C., Wash, R., Velasquez, A., & Ozkaya, E. (2010). Motivations to Participate in Online Communities. *CHI '10 Proceedings of the SIGCHI Conference on Human Factors in Computing Systems*, (pp. 1927-1936). Atlanta.

Lauder, W., Mummery, K., Jones, M., & Caperchione, C. (2006). A comparison of Healht Behaviours in Lonely and Non-Lonely Populations. *Psychology, Health & Medicine, 11*(2), 233-245.

Lipford, H. R., Besmer, A., & Watson, J. (2008). Understanding Privacy Settings in Facebook with an Audience View. *USPEC*.

Litwin, H. (2001). Social Network Type and Morale in Old Age. *The Gerontologist*, 519-524.

Longman, J., Passey, M., Singer, J., & Morgan, G. (2013). The Role of Social Isolation in Frequent and/or Avoidable Hospitilizations: Rural Community-Based Service Providers' Perspective. *Australian Health Review, 37*, 223-231.

Malhotra, N., Kim, S., & Patil, A. (2006). Common Method Variance in IS Reserch: A Comparison of Alternative Approaches and a Reanlyasis of Past Research. *Management Science, 52*(12), 1865-1883.

Mallenius, S., Rossi, M., & Tuunainen, V. K. (2007). Factors Affecting the Adoption and Use of Mobile Devices and Services by Elderly People- Results from a Pilot Study. *6th Annual Global Mobility Round Table.* LA.

Maslow, A. (1970). *Motivations and Personality 2nd edition.* New York: Harper & Row.

Mathews, M., Pourghasem, M., & Hughes, I. (2008). Internet Technology and Social Capital: How the Internet Affects Seniors' Social Capital and Wellbeing. *Journal of Cumputer-Mediated Communication*, 202-220.

McHugh, M. L. (2012). Interrator Reliabilty: The Kappa Statistic. *Biochem Medica, 22*(3), 276-282.

Meyers, L., Gamst, G., & Guarino, A. (2006). *Applied Multivariate Research: Design and Interpretation.* Thousnad Oaks, CA: Sage Publications.

Mislove, A., Marcon, M., Gummadi, K., Druschel, P., & Battacharjee, B. (2007). Measurement and Analysis of Online Social Networks. *IMC'07.* San Deigo: Internet Measurement Conference.

Mochen, Y., & Xunhua , G. (2013). *Relationship Between Online and Offline Social.* Retrieved from WHICEB 2013 Proceedings. 86.: http://aisel.aisnet.org/whiceb2013/86/?utm_source=aisel.aisnet.org%2Fwhiceb2013%2F86&utm_medium=PDF&utm_campaign=PDFCoverPages

Morrison, M. A., Cheong, H., & McMillan, S. (2013). Positng, Lurking and Networking: Behaviors and Characteristics of Consumers in the Context of User-Generated Content. *Journal of Interactive Advertising*, 97-108.

Muller, M. (2012). Lurking as Personal Trait or Situational Disposition? Lurking and Contributing in Enterprise Social Media. *CSCW'12* (pp. 253-256). Seattle: ACM.

Netuveli, G., Wiggins, R., Hildon, Z., Montgomery, S., & Blane, D. (2006). Qualtiy of Life at Older Ages: Evidence from the English Longitudinal Study of Aging (Wave 1). *Journal Epidemiol Community Health*, 357-363.

Neves, B. (2015). Does the Internet Matter for Strong Ties? Bonding Social Capital, Internet Use and Age-Based Inequality. *International Review of Sociology, 25*(3), 415-433.

Neves, B., Fonseca, J., Amaro, F., & Pasqualotti, A. (2018). Social Capital and Internet Usa in an Age-Comparative Perspective with a Focus on Later Life. *PLOS One, 13*(2), 1-27.

Nilsson, J., Rana, A. M., & Kabir, Z. N. (2006). Social Capital and Quality of Life in Old Age: Results from a Cross-Sectional Study in Rural Bangladesh. *Journal of Aging and Health, 18*(3), 419-434.

Olsen, R., Olsen, J., Gunner-Svensson, F., & Waldstrom, B. (1991). Social Networks and Longevity. A 14 Year Follow-Up Study Among Elderly in Denmark. *Social Science Med.*, 1189-1195.

Osatuyi, B. (2013). Information Sharing on Social Media Sites. *Computers in Human Behavior, 29*, 2622-2631.

Pedroni, M., Pasquali, F., & Carlo, S. (2014). My Friends are my Audience: Mass-mediation of Personal Content and Relations in Facebook. *Observatorio Journal*, 97-113.

Penning, M. J., Liu, G., & Chou, P. (2014). Measuring Loneliness among middle-aged and older adults: The UCLA and de Jong Gierveld loneliness scales. *Social Indicators Research*, 1147-1166.

Perissinotto, C., Cenzer, I., & Covinsky, K. (2012). Lonliness in Older Persons: A Predictor of Functional Decline and Death. *Internal Medicine*, 1078-1084.

Petter, S., Straub, D., & Rai, A. (2007). Specifying Formative Constructs in Information Systems Research. *MIS Quarterly, 31*(4), 623-656.

Pew Research. (2017, Jan 12). *Social Media Fact Sheet.* Retrieved from Pew Research Centre: http://www.pewinternet.org/fact-sheet/social-media/

Pew Research Center. (2014, April 3). *Older Adults and Technology Ues.* Retrieved April 14, 2016, from Pew Research Center: http://www.pewinernet.org/2014/04/03/older-adults-and technology-use/

Ping Jr., R. (1995). A Parsimonious Estimating Technique for Interaction and Quadratic atent Variables. *Journal of Marketing Research*, 336-347.

Pinquart , M., & Sorensen, S. (2001). Influences on Loneliness in Older Adults: A Meta-Analysis. *Basic and Applied Social Psychology* , 245-266.

Pinquart, M. (2003). Loneliness in Married, Widowed, Divorced and Never-Married Older Adults. *Journal of Social nad Personal Relationships*, 31-53.

Pinquart, M., & Sorensen, S. (2000). Influences of Social economic Status, Social Network and Competence on Subjective Well-Being in Later Life: A Meta-Analysis. *American Psychological Association*, 187-224.

Podsakoff, P., MacKenzie, S., Lee, J.-Y., & Podsakoff, N. (2003). Common Method Biases in Behavioral Research: A Critical Review of the Literature and Recommended Remiedis. *Journal of Applied Psychology, 88*(5), 879-903.

Pollet, T., Roberts, S., & Dunbar, R. (2010). Use of Social Network Sites and Instant Messaging Does Not Lead to Increased Offline Social Network Size,or to Emotionally Closer Relationships with Offline Network Members. *CYBERPSYCHOLOGY, BEHAVIOR, AND SOCIAL NETWORKING, 00*(0).

Portes, A. (1998). Social Capital: Its origins and applications in modern sociology. *Annual Review of Sociology*, 0-12.

Powdthavee, N. (2008). Putting a Price Tag on Friends, Relatives, and Neighbours: Using Surveys of life Satisfactions to Value Social Relationships. *The Journal of Socia-Economics, 37*, 1459-1480.

Preece, J., Nonnecke, B., & Andrews, D. (2004). The Top Five Reasons for Lurking: Improving Community Experience for Everyone. *Computers in Human Behavior*, 201-223.

Primack, B., Shensa, A., Sidani, J., Whaite, E., Lin, L., Rosen, D., . . . Miller, E. (2017). Soical Medial Use and Perceived Social Isolation Among Young Adults in the U.S. *American Journal of Preventive Medicine, 53*(1), 1-8.

Putnam, R. D. (2000). *Bowling Alone.* New York: Simon & Schuster.

Quinn, K. (2016). Contextual Social Capital: Linking the Contexts of Social Media Use to its Outcomes. *Information, Communication & Society*, 582-600.

Rau, P.-L. P., Gao, Q., & Ding, Y. (2008). Relationsip Betwenn the Level of Intimacy and Lurking in Online Social Network Services. *Computers in Human Behavior, 24*, 2757-2770.

Ridings, C., Gefen, D., & Arinze, B. (2006). Psychological Barriers: Lurker and Poster Motivation and Behavior in Online Communities. *Communications of the Association for Information Systems*, 329-354.

Rokach, A. (1988). The experinece of Loneliness: A tri-level Model. *Journal of Psychology*, 531-544.

Routasalo, P., Savikko, N., Tilvis, R., Strandberg, T., & Pitkala, K. (2006). Social Contact and Their Relationship to Loneliness Among Aged People - A Population-Based Study. *Gerontology, 52*, 181-187.

Sarstedt, M., Ringle, C., & Hair, J. (2017). Partial Least Squares Structural Equation Modeling. In C. Homburg, M. Klamann, & A. Vomberg, *Handbook of Market Research* (pp. 1-34). Springer International Publishing.

Savikko, N., Routasalo, P., Tilvis, R., Strandberg, T., & Pitkala, K. (2005). Predictors and Subjective causes of Loneliness in an Aged Population. *Archives of Gerontology and Geriatrics*, 223-233.

Selwyn, N. (2004). The Information Aged: A Qualitative Study of Older Adults' Use of Information and Communications Technology. *Journal of Aging Studies*, 369-384.

Smock, A., Ellison, N., Lampe, C., & Wohn, D. (2011). Facebook as a Toolkit: A Used and Gratification Approach to Unbundling Feature Use. *Computers in Human Behavior, 27*(6), 2322-2329.

Statistics Canada. (2010, 05 10). *Internet use by individuals, by selected characteristics* . Retrieved from Statistics Canada: http://www.statcan.gc.ca/tables-tableaux/sum-som/l01/cst01/comm35a-eng.htm

Statistics Canada. (2015, 09 28). *Estimates of population, by age group and sex for July 1, Canada, provinces and territories.* Retrieved from Government of Canada - Statistics Canada: http://www5.statcan.gc.ca/cansim/a26?lang=eng&retrLang=eng&id=0510001&&pattern=&stByVal=1&p1=1&p2=31&tabMode=dataTable&csid=

Statistics Canada. (2017, Sept 27). *Population by sex and age group*. Retrieved from Statistics Canada: http://www.statcan.gc.ca/tables-tableaux/sum-som/l01/cst01/demo10a-eng.htm

Straub, D., Bourdeau, M.-C., & Gefen, D. (2004). Validation Guidelines for a Positivist Research. *The Communication of the Association for Information Systems, 13*(24), 380-427.

Sum, S., Mathews, M., Poughasem, M., & Hughes, I. (2008). Internet Technology and Social Capital: How the Internet Affects Seniors'social Capital and Wellbeing. *Journal of Computer-Mediated Communication*, 202-220.

Sum, S., Mathews, R. M., Hughs, I., & Campbell, A. (2008). Internet Use and Loneliness in Older Adults. *Cyber Psychology & Behavior*, 209-211.

Tenehaus, M. (2006). Component-based Structural Equation Modelling. *Total Quality Management*, 871-886.

Thomas, K., Akobundu, U., & Dosa, D. (2015). More Than A Meal? A Randomized Control Trial Comparing the Effects of Home-Delivered Meals Programs on Participants' Feelings of Loneliness. *The Gerontological Society of America*, 1-10.

Tsai, H.-y. S., Shillair, R., Cotten, S., Winstead, V., & Yost, E. (2015). Getting Grandma Online: Are Tablet the Answer for increasing Digital Inclusion for Older Adults in the U.S.? *Educational Gereontology*, 695-709.

Ullman, J. B., & Bentler, P. M. (2013). Structural Equation Modeling. In I. B. Weiner, *Handbook of Psychology 2nd edition* (pp. 661-690). John Wiley & Sons, Inc.

Venkatesh, V., & Ramesh, V. (2006). Web and Wireless Site Usability: Understanding Diffferences and Modeling Use. *MIS Quarterly*, 181-206.

Victor, C., Scambler, S., Bond, J., & Bowling, A. (2000). Being Alone in Later Life: Loneliness, Social Isolation and Living Alone. *Reviews in Clinical Greontology*, 407-417.

Vierra, A., & Garrett, J. (2005). Understanding Interobserver Agreement: The Kappa Statisitic. *Family Medicine*, 360-363.

Vitak, J., Ellison, N., & Steinfield, C. (2011). The Ties that Bond: Re-Examining the Relationship between Facebook Use and Bonding Social Capital. *Proceedings of the 44th Hawaii International Conference on System Sciences* (pp. 1530-1605). Kauai: IEEE.

Vogel, E., Rose, J., Roberts, L., & Eckles, K. (2014). Social Comparison, Social Media, Self-Esteem. *Psychology of Popular Media Culture, 3*(4), 206-222.

Vosner, H., Bobek, S., Kokol, P., & Krecic, M. J. (2016). Attitudes of Active Older Internet Users Towards Online Social Networking. *Computers in Human Behavior*, 230-241.

Vroman, K., Arthanat, S., & Lysack, C. (2015). "Who over 65 is online?" Older Adults' Dispositions Towards Infomation Communication Technology. *Computers in Human Behavior, 43*, 156-166.

Wagner, N., Hassanien, K., & Head, M. (2010). Computer use by older adults: A multi-disciplinary review. *Computers in Human Behavior*, 870-882.

Waycott, J., Vetere, F., Pedell, S., Morgans, A., Ozanne, E., & Kulik, L. (2016). Not For Me: Older Adults Choosing not to Participate in a Social Isolation Intervention. *CHI 2016* (pp. 746-757). San Jose: CHI.

Wellman, B., Haase, A., Witte, J., & Hampton, K. (2001). Does the Internet Increase, Decrease, or Supplement Social Capital? *American Behavioral Scientist*, 436-465.

Whiting, A., & Williams, D. (2013). Why People use Social Media: A uses and Gratification Approach. *Qualitative Market Research*, 362-369.

Williams, D. (2006). On and Off the Net: Scales for Social Capital in an Online Era. *Journal of Computer-Mediated Communication, 11*(2), 593-628.

Xu, C., Ryan, S., Prybutok, V., & Wen, C. (2012). It is not for Fun: An Examination of Social Network Site Usage. *Faculty Research & Creative Activity*.

Your Dictionary. (2018). *Computer definition Wii.* Retrieved from Your Dictionary: http://www.yourdictionary.com/wii

10. Definitions

Loneliness - is defined as individual perceptions of the lack of meaningful social connections that cause them emotional distress.

Social Isolation –is defined as a lack of quantity of social connections that an individual experiences.

Social Networking Sites –are an online site that individuals can join by constructing a profile, creating a list of connections (which others may or may not be able to view) and have the ability to communicate with others through various methods, for example texting, posting etc.

A. Appendix: Construct Definitions and Study Results

Table A.1a: Construct Definitions

Construct	Definition
Perceived Health Status	The individual's perception of their health and its impact on their daily life.
Perceived Financial Wellbeing	The individual's degree of satisfaction with their finances to meet their living needs.
Bridging	Bridging of social capital is a form of weak ties. These social relationships provide loose connections for information. (Antheunis, Vanden Abeele, & Kanters, 2015).
Bonding	Bonding is a form of strong ties between each other. Bonding is connections between kin or close friends, which provides emotional support for individuals (Antheunis, Vanden Abeele, & Kanters, 2015).
Satisfaction with Offline Relationships	The perceived satisfaction of the number and quality of the existing social connections (Hawlkley, et al., 2008; Savikko, et al., 2005)
Use of Social Networking Sites	SNSs are online sites that allow for collaboration, communication and interaction between members.
Loneliness	Loneliness is defined as individual perceptions of the lack of meaningful social connections that cause them emotional distress.
Intensity of Use	The frequency and amount of time SNSs are used.
Active Use	The matter in which SNSs are used either passively or actively. With Active Use defined as posting messages, commenting on others content and interacting with others.
Contact breadth	The number and type of social connections.
Message Content-Information Sharing	Is the type of information exchanged that is public information, with non-emotional/ informational content
Message Content-Private/Emotional Content	It is the type of information exchanged, which is private and emotional in content

Table A.1: VIF Measurements

	VIF
A/PU1	1.760
A/PU2	1.637
A/PU3	2.337
A/PU4	2.346
A/PU5	2.545
A/PU6	1.348
A/PU7	1.827
A/PU8	2.255
A/PU9	1.992
BOSC1	1.540
BOSC2	2.080
BOSC4	2.263
BOSC6	2.616
BOSC7	2.182
BRSC3	1.672
BRSC4	2.469
BRSC5	2.333
BRSC7	1.549
CP1	1.432
CP2	1.902
CP3	2.034
CP4	2.022
CP5	1.493
CP6	1.472
CP7	1.367
CP8	1.855
CP9	1.914
CP10	2.229
CP11	2.208
CP8	2.034
CP9	2.022
CT1	1.451
CT2	1.503
CT3	1.352
CT4	1.528
CT5	1.527

	VIF
CT6	1.286
HWB1	2.543
HWB3	2.146
HWB4	2.618
HWB5	1.861
HWB6	2.450
HWB7	2.721
LON1	2.074
LON2	**3.616**
LON3	**3.492**
LON4	2.677
LON5	2.377
SOR3	2.161
SOR4	1.979
SOR5	2.322

Table A.2: Harmon One Factor Analysis

Communalities		
Measurement	**Initial**	**Extraction**
APU1	1.000	0.219
APU2	1.000	0.124
APU3	1.000	0.050
APU4	1.000	0.028
APU5	1.000	0.002
APU6	1.000	0.021
APU7	1.000	0.128
APU8	1.000	0.066
APU9	1.000	0.024
CP1	1.000	0.015
CP2	1.000	0.034
CP3	1.000	0.205
CP4	1.000	0.047
CP5	1.000	0.193
CP6	1.000	0.275
CP7	1.000	0.152
CP8	1.000	0.032
CP9	1.000	0.027
CP10	1.000	0.058
CP11	1.000	0.038
CT1	1.000	0.227
CT2	1.000	0.306
CT3	1.000	0.115
CT4	1.000	0.106
CT5	1.000	**0.477**
CT6	1.000	**0.430**
FN1	1.000	0.012
FN2	1.000	0.004
FN3	1.000	0.014
HE1	1.000	0.014
HWB6	1.000	0.046
BRSC3	1.000	0.224
BRSC4	1.000	**0.462**
BRSC5	1.000	0.383
BRSC7	1.000	0.376

Communalities		
Measurement	**Initial**	**Extraction**
BOSC2	1.000	0.014
BOSC4	1.000	0.101
BOSC6	1.000	0.011
BOSC7	1.000	0.017
SOR3	1.000	0.055
SOR4	1.000	0.145
SOR5	1.000	0.095
LON1	1.000	0.001
LON2	1.000	0.142
LON3	1.000	0.108
LON4	1.000	0.126
LON5	1.000	0.130
Extraction Method: Principal Component Analysis.		

***Bolded is above 0.4, but below the 0.5 threshold.**

Table A.3: Cross Loadings of Constructs

Cross Loadings for constructs are highlighted in bold.

	Active use	BOSC	BRISC	Contact breadth	Perceived Financial wellbeing	Perceived Health	Information Sharing	Loneliness	Private Emotional Content	Satisfaction with Offline Relationships
A/PU3	**0.795**	0.386	0.420	0.570	0.052	0.039	0.436	0.026	0.393	-0.246
A/PU4	**0.773**	0.332	0.352	0.504	-0.047	-0.019	0.405	0.018	0.377	-0.209
A/PU5	**0.782**	0.318	0.417	0.534	0.016	-0.011	0.391	0.022	0.329	-0.224
A/PU7	**0.737**	0.418	0.453	0.599	-0.079	0.010	0.412	0.027	0.433	-0.202
A/PU8	**0.794**	0.411	0.444	0.579	-0.044	-0.066	0.477	0.027	0.445	-0.195
A/PU9	**0.805**	0.381	0.548	0.582	-0.045	0.051	0.573	0.019	0.440	-0.226
BOSC1	0.400	**0.719**	0.456	0.443	-0.046	-0.055	0.348	0.058	0.416	-0.283
BOSC2	0.384	**0.829**	0.419	0.414	-0.025	-0.053	0.330	0.055	0.545	-0.302
BOSC4	0.404	**0.827**	0.479	0.439	-0.024	0.001	0.344	0.020	0.473	-0.228
BOSC6	0.391	**0.864**	0.483	0.447	-0.088	-0.010	0.353	0.079	0.454	-0.326
BOSC7	0.395	**0.838**	0.511	0.454	-0.049	-0.030	0.347	0.077	0.501	-0.298
BRSC3	0.462	0.421	**0.788**	0.450	0.111	0.014	0.531	-0.045	0.374	-0.156
BRSC4	0.404	0.441	**0.847**	0.458	0.043	0.044	0.520	0.049	0.348	-0.219
BRSC5	0.441	0.484	**0.837**	0.493	0.005	0.012	0.528	0.023	0.356	-0.238
BRSC7	0.535	0.518	**0.794**	0.605	0.016	-0.025	0.597	0.072	0.435	-0.284
CP5	0.352	0.293	0.241	**0.455**	-0.016	-0.062	0.339	0.064	0.351	-0.145
CP6	0.435	0.342	0.415	**0.655**	0.020	0.041	0.338	-0.059	0.311	-0.104
CP7	0.320	0.299	0.287	**0.502**	-0.042	-0.069	0.297	0.014	0.362	-0.039
CP8	0.319	0.298	0.355	**0.564**	0.035	-0.017	0.395	0.052	0.300	-0.134
CP9	0.455	0.358	0.466	**0.714**	0.094	0.014	0.507	0.031	0.385	-0.196
CP10	0.400	0.354	0.345	**0.600**	0.093	0.008	0.383	0.055	0.343	-0.153

	Active use	BOSC	BRISC	Contact breadth	Perceived Financial wellbeing	Perceived Health	Information Sharing	Loneliness	Private Emotional Content	Satisfaction with Offline Relationships
CP11	0.497	0.362	0.385	**0.643**	0.076	0.022	0.421	0.105	0.442	-0.199
CP1	0.471	0.276	0.318	**0.512**	0.008	-0.007	0.270	-0.145	0.260	-0.116
CP2	0.607	0.392	0.446	**0.723**	0.000	0.034	0.351	-0.065	0.381	-0.169
CP3	0.423	0.328	0.332	**0.568**	0.043	-0.047	0.301	0.019	0.327	-0.195
CP4	0.499	0.406	0.423	**0.713**	-0.004	-0.055	0.393	0.118	0.395	-0.267
CT1	0.373	0.411	0.373	0.396	-0.049	-0.046	0.377	0.110	**0.788**	-0.248
CT2	0.416	0.498	0.365	0.461	-0.006	-0.087	0.430	0.125	**0.824**	-0.225
CT3	0.459	0.499	0.387	0.462	-0.026	-0.036	0.376	0.076	**0.795**	-0.246
CT4	0.548	0.310	0.461	0.482	0.015	0.021	**0.794**	0.083	0.407	-0.293
CT5	0.436	0.378	0.553	0.462	0.081	-0.035	**0.828**	0.136	0.438	-0.273
CT6	0.424	0.318	0.582	0.471	0.007	0.033	**0.776**	0.075	0.337	-0.266
FN1	-0.041	-0.055	0.014	0.003	**0.928**	0.257	0.042	-0.271	-0.024	0.173
FN2	-0.040	-0.054	0.069	0.044	**0.857**	0.237	0.026	-0.258	-0.025	0.188
FN3	-0.027	-0.050	0.049	0.024	**0.879**	0.284	0.036	-0.221	-0.051	0.188
HE1	0.106	0.012	0.086	0.115	0.266	**0.841**	0.085	-0.267	-0.063	0.094
HE2	-0.038	-0.081	-0.021	-0.036	0.223	**0.886**	-0.001	-0.273	-0.058	0.117
HE3	-0.047	-0.027	-0.025	-0.033	0.259	**0.925**	-0.050	-0.341	-0.065	0.164
LON1	-0.054	0.037	-0.067	-0.055	-0.245	-0.271	0.039	**0.828**	0.096	-0.376
LON2	0.045	0.057	0.028	-0.008	-0.218	-0.316	0.085	**0.886**	0.142	-0.309
LON3	0.043	0.018	0.024	-0.019	-0.237	-0.332	0.122	**0.890**	0.065	-0.354
LON4	0.077	0.119	0.059	0.066	-0.261	-0.255	0.124	**0.838**	0.157	-0.256
LON5	0.030	0.091	0.121	0.040	-0.222	-0.239	0.173	**0.805**	0.098	-0.299
SOR3	-0.261	-0.303	-0.242	-0.232	0.169	0.154	-0.319	-0.331	-0.259	**0.884**
SOR4	-0.258	-0.323	-0.268	-0.232	0.125	0.050	-0.302	-0.271	-0.234	**0.843**

	Active use	BOSC	BRISC	Contact breadth	Perceived Financial wellbeing	Perceived Health	Information Sharing	Loneliness	Private Emotional Content	Satisfaction with Offline Relationships
SOR5	-0.223	-0.309	-0.234	-0.182	0.202	0.160	-0.295	-0.384	-0.288	**0.912**

Table A.4: Fornell-Larcker Criterion

	Active use	BOSC	BRISC	Contact breadth	Perceived Financial wellbeing	Perceived Health Status	Information Sharing	Intensity of Use	Loneliness	Private Emotional Content	Satisfaction with Offline Relationships
Active use	**0.781**										
BOSC	0.583	**0.817**									
BRISC	0.627	0.575	**0.817**								
Contact breadth	0.722	0.538	0.621	-							
Financial wellbeing	-0.033	-0.056	0.052	0.032	**0.903**						
Perceived Health Status	0.003	-0.036	0.011	0.012	0.282	**0.885**					
Information Sharing	0.581	0.421	0.670	0.589	0.044	0.007	**0.800**				
Intensity of Use	0.507	0.345	0.377	0.454	-0.135	-0.184	0.333	**0.791**			
Loneliness	0.030	0.071	0.033	0.000	-0.278	-0.335	0.124	0.112	**0.850**		
Private Emotional Content	0.520	0.587	0.467	0.550	-0.033	-0.070	0.492	0.329	0.128	**0.803**	
Satisfaction with Offline Relationships	-0.278	-0.352	-0.279	-0.241	0.192	0.145	-0.346	-0.296	-0.379	-0.298	**0.880**

Table A.5: Factor Loadings

	Active Use	BOSC	BRISC	Contact Breadth	Loneliness	Perceived Financial Wellbeing	Perceived Health status	Private Information Sharing	Public Information Sharing	Satisfaction of Relationship
A/PU1	**0.545**	0.197	0.425	0.408	-0.043	-0.013	0.011	0.231	0.342	-0.200
A/PU2	**0.644**	0.323	0.424	0.435	-0.028	0.024	0.024	0.228	0.392	-0.110
A/PU3	**0.690**	0.386	0.420	0.570	0.026	0.041	0.039	0.393	0.436	-0.246
A/PU4	**0.585**	0.332	0.351	0.504	0.018	-0.053	-0.019	0.377	0.405	-0.209
A/PU5	**0.634**	0.318	0.417	0.533	0.022	0.011	-0.011	0.329	0.391	-0.224
A/PU6	**0.650**	0.431	0.338	0.479	0.046	-0.079	-0.081	0.400	0.318	-0.126
A/PU7	**0.746**	0.418	0.453	0.599	0.027	-0.085	0.010	0.433	0.412	-0.202
A/PU8	**0.731**	0.411	0.443	0.579	0.027	-0.048	-0.066	0.445	0.477	-0.195
A/PU9	**0.804**	0.381	0.547	0.582	0.019	-0.049	0.051	0.440	0.573	-0.226
BOSC1	0.425	**0.720**	0.456	0.443	0.058	-0.047	-0.055	0.416	0.348	-0.283
BOSC2	0.414	**0.827**	0.419	0.413	0.055	-0.023	-0.053	0.545	0.330	-0.302
BOSC4	0.478	**0.829**	0.480	0.439	0.020	-0.030	0.001	0.473	0.344	-0.228
BOSC6	0.449	**0.864**	0.483	0.447	0.079	-0.094	-0.010	0.454	0.353	-0.326
BOSC7	0.432	**0.836**	0.511	0.454	0.077	-0.050	-0.030	0.501	0.347	-0.298
BRSC3	0.490	0.421	**0.788**	0.450	-0.045	0.110	0.014	0.374	0.531	-0.156
BRSC4	0.473	0.442	**0.847**	0.458	0.049	0.038	0.044	0.348	0.520	-0.219
BRSC5	0.514	0.484	**0.839**	0.493	0.023	0.000	0.012	0.356	0.528	-0.238
BRSC7	0.558	0.518	**0.792**	0.605	0.072	0.015	-0.025	0.435	0.597	-0.284
CP5	0.366	0.292	0.241	**0.455**	0.064	-0.019	-0.062	0.351	0.339	-0.145
CP6	0.469	0.343	0.415	**0.655**	-0.058	0.015	0.041	0.311	0.338	-0.104
CP7	0.327	0.299	0.286	**0.502**	0.014	-0.045	-0.069	0.362	0.297	-0.039

	Active Use	BOSC	BRISC	Contact Breadth	Loneliness	Perceived Financial Wellbeing	Perceived Health status	Private Information Sharing	Public Information Sharing	Satisfaction of Relationship
CP8	0.354	0.299	0.355	**0.565**	0.052	0.038	-0.017	0.300	0.395	-0.134
CP9	0.467	0.358	0.466	**0.714**	0.031	0.078	0.014	0.385	0.507	-0.196
CP10	0.434	0.355	0.345	**0.601**	0.055	0.086	0.008	0.343	0.383	-0.153
CP11	0.507	0.362	0.385	**0.643**	0.105	0.069	0.022	0.442	0.421	-0.199
CP1	0.451	0.276	0.317	**0.512**	-0.145	0.013	-0.007	0.260	0.270	-0.116
CP2	0.616	0.392	0.446	**0.723**	-0.065	0.003	0.034	0.381	0.351	-0.169
CP3	0.454	0.328	0.332	**0.567**	0.019	0.042	-0.047	0.327	0.301	-0.195
CP4	0.524	0.406	0.423	**0.713**	0.118	-0.005	-0.055	0.395	0.393	-0.267
CT1	0.391	0.411	0.373	0.396	0.110	-0.053	-0.046	**0.788**	0.377	-0.248
CT2	0.438	0.497	0.365	0.461	0.125	-0.013	-0.087	**0.824**	0.430	-0.225
CT3	0.465	0.498	0.387	0.461	0.076	-0.023	-0.036	**0.795**	0.376	-0.246
CT4	0.521	0.310	0.460	0.482	0.083	0.013	0.021	0.407	**0.794**	-0.293
CT5	0.452	0.378	0.552	0.462	0.136	0.076	-0.035	0.438	**0.828**	-0.273
CT6	0.497	0.318	0.583	0.471	0.075	0.001	0.033	0.337	**0.776**	-0.266
FN1	-0.057	-0.055	0.013	0.003	-0.271	**0.909**	0.257	-0.024	0.042	0.173
FN2	-0.040	-0.054	0.069	0.044	-0.258	**0.883**	0.237	-0.025	0.026	0.188
FN3	-0.029	-0.050	0.049	0.024	-0.221	**0.894**	0.284	-0.051	0.036	0.188
HE1	0.111	0.013	0.086	0.115	-0.267	0.270	**0.841**	-0.063	0.085	0.094
HE2	-0.044	-0.081	-0.020	-0.036	-0.273	0.227	**0.886**	-0.058	-0.001	0.117
HE3	-0.041	-0.027	-0.025	-0.033	-0.341	0.267	**0.925**	-0.065	-0.050	0.164
LON1	-0.065	0.037	-0.067	-0.055	0.828	-0.244	-0.271	0.096	0.039	-0.376
LON2	0.035	0.057	0.028	-0.008	**0.886**	-0.225	-0.316	0.142	0.085	-0.309
LON3	0.017	0.018	0.024	-0.019	**0.890**	-0.241	-0.332	0.065	0.122	-0.354

	Active Use	BOSC	BRISC	Contact Breadth	Loneliness	Perceived Financial Wellbeing	Perceived Health status	Private Information Sharing	Public Information Sharing	Satisfaction of Relationship
LON4	0.083	0.119	0.059	0.065	**0.838**	-0.259	-0.255	0.157	0.124	-0.256
LON5	0.054	0.091	0.121	0.040	**0.805**	-0.227	-0.239	0.098	0.173	-0.299
SOR3	-0.239	-0.303	-0.242	-0.232	-0.331	0.180	0.154	-0.259	-0.319	**0.884**
SOR4	-0.232	-0.322	-0.268	-0.232	-0.271	0.132	0.050	-0.234	-0.302	**0.843**
SOR5	-0.203	-0.309	-0.234	-0.182	-0.384	0.213	0.160	-0.288	-0.295	**0.912**

Table A.6: Measurement Loadings and Weights

Variable	Mean	St.Dev.	Item Loadings (t-values)	Item Weights (t-values)
A/PU1 –*I use social networks to send pictures to specific people and/or post for everyone.*	**4.61**	1.904	0.7946 (24.7051)	0.2108 (12.2129)
A/PU2 – *I use social networks to send videos to specific people and or post for everyone***.**	**3.91**	1.944	0.7735 927.3609)	0.1786 (11.5010)
A/PU3 –*I post comments on others posts and blogs in social networks*	**5.26**	1.563	0.7820 (27.1999)	0.1938 (11.7086)
A/PU4 – *I use social networks to email others.*	**4.38**	1.882	0.7366 (22.3555)	0.1809 (10.3443)
A/PU5 –*I use social networks to have conversations with others using text voice, or video.*	**4.70**	1.818	0.7940 (27.8591)	0.2277 (12.3053)
A/PU6 – *I use social networks to express my views by posting them.*	**4.82**	1.698	0.8053 (33.2471)	0.2233 (16.0900)
A/PU7 –*I use social networks to forward information I have read to others.*	**4.96**	1.663	0.7191 (19.0652)	0.2456 (12.8759)
A/PU8 - *I use social networks to express my views by posting them.*	**4.81**	0.095	0.786 (13.050)	0.224 (1.992)
A/PU9 - *I use social networks to forward information I have read to others.*	**4.92**	0.095	0.786 (16.741)	0.367 (4.295)
BOSC1 –*I use social networks to form a closer felling to someone.*	**4.12**	1.584	0.8289 (45.7586)	0.2241 (18.9603)

Variable	Mean	St.Dev.	Item Loadings (t-values)	Item Weights (t-values)
BOSC2 –*On social networks there is someone I can discuss intimate problems with.*	**2.89**	1.786	0.8266 (33.2495)	0.2597 (16.3975)
BOSC4 –*There is someone I can turn to for advice about making very important decisions on social networks.*	**3.56**	1.723	0.8637 (46.3588)	0.2413 (19.8885)
BOSC6 –*There are several people that I trust to help me solve my problems on social networks.*	**3.68**	1.771	0.8381 (43.3588)	0.2400 (18.8371)
BOSC7 –*There is always some to chat with on social networks about my day-to-day problems.*	**3.81**	1.676	0.7882 (28.9535)	0.2588 (18.2239)
BRSC3 –*Based on the people I interact with on social networks it is easy for me to find useful information.*	**5.12**	1.186	0.8465 (36.4962)	0.2917 (22.7352)
BRSC4 –*The people I interact with on social networks help keep me current on the news.*	**4.62**	1.504	0.8368 (37.8623)	0.2881 (21.6746)
BRSC5 *–The people I communicate with on social networks help keep me current with what is new and popular.*	**4.52**	1.448	0.7944 (26.9548)	0.2967 (16.4970)
BRSC7 *–I like interacting with others on social networks as I learn new things.*	**5.14**	1.333	0.788 (26.080)	0.343 (16.232)
CP –*Do you connect with family members on social networks?*	**5.81**	1.229	0.500 (7.112)	0.062 (0.928)
CP2 –*Do you connect with friends on social networks?*	**5.15**	1.558	0.702 (12.017)	0.427 (4.888)
CP3 –*Do you connect with acquaintances on social networks?*	**4.60**	1.90	0.554 (7.954)	-0.196 (2.034)

Variable	Mean	St.Dev.	Item Loadings (t-values)	Item Weights (t-values)
CP4 – *Do you connect with new friends on social networks?*	**3.90**	1.94	0.693 (11.976)	0.216 (2.198)
CP5 –*Do you connect with strangers on social networks?*	**5.26**	1.57	0.439 (5.190)	0.088 (1.076)
CP6 –*Do you connect with high school friends on social networks?*	**4.35**	1.89	0.632 (10.429)	0.213 (2.758)
CP7 –*Do you connect with religious groups on social networks?*	**4.66**	1.83	0.493 (7.351)	0.121 (1.632)
CP8 *–Do you connect through hobby groups on social networks?*	**3.16**	1.923	0.551 (7.979)	0.068 (0.779)
CP9 *–Do you connect through special interest groups on social networks?*	**4.20**	1.792	0.705 (11.276)	0.364 (3.307)
CP10 –*Do you connect through clubs on social networks?*	**2.95**	1.790	0.588 (9.142)	0.030 (0.306)
CP11 –*Do you connect through other groups on social networks?*	**3.70**	1.803	0.7884 (26.7618)	0.3827 (14.7915)
CT1 –*I use social networks to communicate personal information with others.*	**4.03**	1.836	0.8236 (35.8432)	0.4262 (18.8771)
CT2 –*I use social networks for communication of an an emotional nature, such as issues with relationships, health problems etc.*	**3.27**	1.923	0.7954 (29.6055)	0.4363 (14.9775)
CT3 –*When I want to have a private chat with friends or family, I use social networks to communicate with them.*	**3.30**	1.953	0.7945 (6.3880)	0.3678 (6.0369)
CT4 –*I use social networks to share public information to others.*	**4.78**	1.785	0.8281 (6.4655)	0.4434 (5.9038)

Variable	Mean	St.Dev.	Item Loadings (t-values)	Item Weights (t-values)
CT5 –*I use social networks to obtain information form my connections.*	**4.85**	1.538	0.7759 (6.2317)	0.4390 (5.5916)
CT6 *–I use social networks for finding public information such as news, blogs, etc.*	**4.76**	1.741	0.9278 (76.0613)	0.3006 (10.8999)
FN1 –*I have enough money to live on.*	**4.71**	1.697	0.9445 (99.4364)	0.2750 (11.3390)
FN2 *–My finances allow me to do everything I would like.*	**3.17**	1.873	0.8567 (45.3667)	0.2862 (8.5828)
FN3 –*I feel I am financially independent.*	**4.39**	1.878	0.8795 (45.4313)	0.2456 (6.7066)
HE1 –*I feel I am healthy.*	**4.89**	1.546	0.8412 (26.0967)	0.3411 (7.8579)
HE2 *–I feel my health limits the activities that I am able to do***.**	**3.99**	1.949	0.8863 (41.6039)	0.3491 (10.0407)
HE3–*My health does not affect my daily activities.*	**4.48**	1.989	0.9247 (93.2395)	0.4366 (14.4659)
LON1 –*I lack companionship.*	**2.77**	1.876	0.7221 (15.5426)	0.3170 (6.4630)
LON2 –*I experience a general sense of emptiness.*	**2.32**	1.594	0.8281 (34.6095)	0.2591 (11.9191)
LON3 –*I feel isolated form others.*	**2.36**	1.604	0.8856 (52.2736)	0.2379 (14.4440)
LON4 –*I am unhappy being so withdrawn.*	**2.25**	1.548	0.8901 (54.4354)	0.2653 (15.39010

Variable	Mean	St.Dev.	Item Loadings (t-values)	Item Weights (t-values)
LON5 –*I am unhappy being isolated form others***.**	**2.58**	1.774	0.8383 (29.2448)	0.2031 (10.1515)
SOR3 –*I feel I have enough friends without using social networks.*	**4.59**	1.466	0.8047 (27.0215)	0.2091 (9.9723)
SOR4 *–I feel part of a group of friends so I do not need to use social networks.*	**4**	1.556	0.8836 (54.3824)	0.3796 (13.7116)
SOR5 *–I feel the quality of my social relationships is good without using social networking.*	**4.75**	1.433	0.8431 (29.6188)	0.3113 (9.3896)

Table A.7: Heterotrait-Monotrait Ratio

	Active Use	BOSC	BRISC	Contact breadth	Financial wellbeing	Health	Informational Content	Intensity of Use	Loneliness	Private/Emotional Content	Satisfaction with Offline Relationships
Active Use											
BOSC	0.55										
BRISC	0.652	0.669									
Contact breadth	0.067	0.064	0.074								
Perceived Financial wellbeing	0.091	0.064	0.066	0.318							
Perceived Health Status	0.732	0.53	0.852	0.065	0.076						
Informational Content	0.629	0.424	0.477	0.173	0.24	0.458					
Intensity of Use	0.066	0.089	0.098	0.303	0.373	0.157	0.147				
Loneliness	0.646	0.733	0.596	0.046	0.089	0.682	0.452	0.163			
Private/Emotional Content	0.325	0.41	0.329	0.211	0.16	0.444	0.374	0.419	0.376		
Satisfaction with Offline Relationships	0.325	0.410	0.329	0.241	0.211	0.160	0.444	0.374	0.419	0.376	

Table A.8: Correlation

	Active Use	BOSC	BRISC	Contact breadth	Perceived Financial wellbeing	Perceived Health Status	Intensity of Use	Information Sharing	Private Emotional Content	Loneliness	Satisfaction with Offline Relationshi
Active Use	1										
BOSC	0.483	1									
BRISC	0.569	0.575	1								
Contact breadth	0.722	0.538	0.621	1							
Perceived Financial wellbeing	-0.033	-0.056	0.052	0.032	1						
Perceived Health Status	0.003	-0.036	0.011	0.012	0.282	1					
Intensity of Use	0.581	0.421	0.67	0.589	0.044	0.007	1				
Information Sharing	0.507	0.345	0.377	0.454	-0.135	-0.184	0.333	1			
Private/ Emotional Content	0.03	0.071	0.033	0	-0.278	-0.335	0.124	0.112	1		
Loneliness	0.52	0.587	0.467	0.55	-0.033	-0.07	0.492	0.329	0.128	1	

	Active Use	BOSC	BRISC	Contact breadth	Perceived Financial wellbeing	Perceived Health Status	Intensity of Use	Information Sharing	Private Emotional Content	Loneliness	Satisfaction with Offline Relationshi
Satisfaction with Offline Relationships	-0.278	-0.352	-0.279	-0.241	0.192	0.145	-0.346	-0.296	-0.379	-0.298	1