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SOCIAL AND EMOTIONAL IMPACTS OF INTERNET USE ON OLDER ADULTS

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Abstract

The Internet has become a means by which older adults can maintain offline relationships with family and friends, and develop new social networks. Social engagement plays a important role in later life. Staying socially active can help older adults maintain physical and cognitive health. Social capital is also important for older adults‘ mental health and well-being. This study examined whether older adults' online social activities are associated with some social and emotional factors. A total of 82 participants were recruited from two community seniors' centres in Canada. The results of a series of hierarchical regression analyses indicated that older adults' online social activities were positively related to bridging social capital, belongingness and self-esteem, and negatively associated with the feeling of loneliness. The result of a canonical correlation analysis revealed that meeting new people online and great amount of Internet use is predictive of online bridging social capital.

Keywords: Social-emotional, Internet use, older adults

Introduction

Older adults and Internet use

The Internet has changed the way in which people communicate with others. Although older adults have been late adopters to digital technology compared to younger adults, people, aged 50 and over, are among the fastest-growing demographic to use social media such as Facebook, Twitter, Skype, and LinkedIn (Madden, 2010). As of April 2012, 53% of American adults aged 65 and over have used Internet or email, and 70% of them have used Internet on a typical day (Zickuhr & Madden, 2012). In April 2014 the Pew Research Center found 59% of American older adults were Internet users and 47% had a high-speed broadband connection at home (Smith, 2014).

The Internet plays an increasing important role in connecting older adults to news and information, government services, health resources, and

opportunities for social support. It provides a means by which older adults can maintain family bonds, strengthen existing relationship with friends, or develop new social networks (Coulson, 2000). Among the older adults who go online, 46% use social networking sites and these people have more persistent social connections with the people they care about (Smith, 2014). By analyzing data collected online from 222 Australian Internet users aged 55 years or older, Sum, Mathews and Hughes (2009) found that older adults most commonly used the Internet for communication, information and commerce (e.g., buying goods online), followed by entertainment and finding new people. In Canada, nine in ten Internet users who were aged 65 and over used email to keep in touch with large and dispersed extended families and many of them agreed that it has improved their family connections (Statistics Canada, 2007).

Online activities differ among older adults and the Internet takes different roles in their lives. Wagner, Hassanein and Head (2010) reviewed 151 articles that examined Internet use among older adults. The most common use of computers and the Internet is for communication and social support. Benefits include increased contact with family and friends, especially grandchildren, coping with grief, and dealing with geographic boundaries or limited mobility. Different types of online communication have been used, including email, instant messaging, and online forums, each being used to support different social interactions. Ristau (2011) stated that online activities may not only benefit social interaction, but may also contribute to brain health. Cotten, Ford, Ford and Hale (2012) examined the relationship between Internet use and depression among retired American older adults aged 50 or older, and found that Internet use reduces depression categorization by approximately 20-28%. Cotten, Anderson and McCullough (2013) analyzed how Internet use affects perceived social isolation and loneliness of older adults in assisted and independent living communities. They reported that a one-point increase in online frequency was associated with a 0.147-point decrease in respondents' loneliness scores (p = .005) after controlling for the number of friends and family, physical/emotional/social limitations and age.

Social engagement and successful aging

Successful aging - maintaining an independent, positive, healthy, and meaningful quality of life - is a continual challenge for older adults, yet it is essential for older adults and their societies, which benefit both from older adults' continuing contributions and from reduced social and care costs (Kaufman, 2013). Earlier gerontology emphasized the absence of disease or disability as the status of successful aging. In recent years, gerontology researchers have demonstrated that successful aging is a multifaceted

construct. Rowe and Kahn (1997) pointed that cognitive function and social engagement in combination with physical function are the three main components of successful aging. **Social engagement is a key aspect of designing intervention to enhance successful aging (Reichstadt, Sengupta, Depp, Palinkas, & Jeste, 2010). It provides opportunities for older adults to deal with stress, receive social support and connect with friends.** Lewis's (2014) study indicates that social engagement is more important than physical and mental health conditions in affecting Alaska native elders' successful aging. Although the mechanism for how social engagement affects successful aging is not clear (Mendes de Leon, 2005), previous empirical study has demonstrated the positive relationship between social engagement and successful aging. Golden, Canroy and Lawlor (2009) found that social engagement was associated with lower depression and anxiety disorder. When age, sex, depression, cognitive impairment and disability were adjusted, social engagement was found to be associated with better quality of life and happiness. Eisenberger, Taylor, Gable, Hilmert and Lieberman's (2007) study revealed that individuals with regular social interaction showed diminished neuroendocrine stress responses and distress of social separation. Golden et al. (2009) found that wellbeing, depressed mood and hopelessness were all independently related to non-integrated social networks.

Social capital and Internet use

Social capital is a concept that focuses on personal relationships and positive outcomes and resources that come with them (Williams, 2006). Putnam(2000) defined social capital as "the features of social life such as networks, norms, and social trust that facilitate coordination and co-operation for mutual benefit" (p.67). Bridging and boning are the two forms of social capital. Bridging refers to weak social ties in which individuals with different backgrounds make connections through social networks. As a result, bridging may broaden social horizons or world views, or open up opportunities for information or new resources. Conversely, bonding social capital is marked by close-knit networks among people sharing similar backgrounds and beliefs and having stronger personal connections. It provides continued reciprocity among individuals who exchange strong emotional and substantive support.

With the increased Internet use, a great amount of attention has been paid to the relationship between social capital and Internet use. Zhong (2011) made a distinction between online social capital and offline social capital: online social capital is created through computer-mediated communication, whereas offline social capital is based on face-to-face communication. Online bridging social capital is marked by online weak social ties, whereas

online bonding social capital inheres in online strong ties formed by individuals who meet and keep close contact on the Internet. There are debates about whether online communities foster and nurture social capital. Lee and Lee (2010) indicated that it would be more empirically rigorous to investigate how and the extent to which individuals' social capital is impacted by specific forms of Internet activity.

Research purpose and question

By 2050, one in five people in the world will be aged 60 and older (Akitunde, 2012). Many older adults are faced with problems such as loneliness, depression and a lack of social support due to numerous physical, psychological and social role changes, which further challenges their feelings of self-confidence and self-esteem (Mirowsky & Ross, 1992; Tomaka, Thompson, & Palacios, 2006). Staying socially active and maintaining interpersonal relationships can help older adults maintain good physical and emotional health and cognitive function (URMC, 2014). Recent studies have consolidated the effectiveness and subjective importance of social capital for the maintenance of mental health and well-being among older adults (Forsman, 2012). More importantly, older adults have become a very large customer base of Internet. It is an important tool in assisting older adults to live independent and social lives (Adams, Stubbs, & Woods, 2005). So, the purpose of this study is to examine the social and emotional impacts of older adults' online social activities. It aims to understand whether older adults' online communicative activities are associated with some social and emotional factors (e.g., bridging and bonding social capital, loneliness, depression, etc.)

Methods

Participants

The population that was targeted comprised older adults who were aged 55 or over, and Internet users. Participants were recruited from two community seniors' centres in Vancouver, Canada, through a paper-based survey. These centres provide all kinds of activities and facilities to engage seniors, such as Yoga class, dance class/party, table tennis, gym, chatting room, etc. By beginning the survey, they signed a consent form to signify that they had read and understood the study purposes, thus satisfying ethics protocols. A total of 105 people completed the survey, of which 82 have used the Internet and are the focus of this study.

Measures

Information about older adults' health and financial status were collected by asking participants to indicate to what extent (1= Very

dissatisfied, 5= Very satisfied) they are satisfied with their healthy and financial status. Shen and Williams (2011) pointed that the effects of Internet use are very much dependent on the purposes, contexts (with whom they use the media), and individual characteristics of users. In their study, Internet use was measured by the amount of time spent online every week as well as the frequency of different online activities. As discussed in the Introduction section, the most common use of computers and the Internet among older adults is for communication, including communicating with family, real-life friends and developing new friendships. So, in this study Internet use was measured by the amount of time spent online every week and using Internet to (a) communicate with family, (b) communicate with friends, and (c) meet new people online. Participants were asked to indicate on a 5-point scale the frequency of these three online activities (1=Never, 5=All the time).

The social-emotional measures include online bridging and bonding social capital, loneliness, depression, social support, belongingness and self-esteem. These measures reflect distinct social and emotional conditions, but are intimately related. Participation in one's social network is central to the development and maintenance of social capital, the perception of social support and the sense of belongingness, and is an effective way to protect people from or decrease the feelings of loneliness and depression, and increase the sense of self-esteem. Online bridging and bonding social capital were measured by Internet Social Capital Scales (ISCSs, Williams, 2006). ISCSs measure two types of social capital (bridging and bonding) for both online and offline contexts. Each scale has 10 items. This study used 4 of 10 items from the online bridging scale and also 4 of 10 items from the online bonding scale. The two short scales were previously used in Zhong's (2011) study and exhibited good alpha reliabilities, which are .91 and .84, respectively. Loneliness was assessed with the revised UCLA Loneliness Scale (Russell, Peplau, & Cutrona, 1980). The alpha reliability is .88. Depression was measured by the Center for Epidemiological Studies Depression scale (CES-D; Mirowsky & Ross, 1992). It is designed to assess the current level of depression, and is most commonly used in a normal, as opposed to a pathological, population. Its alpha reliability is .86. Social support was tested by Multidimensional Scale of Perceived Social Support (MSPSS; Zimet, Dahlem, Zimet, & Farley, 1988). The MSPSS is a 12-item scale to measure how one perceives their social support system, including an individual's sources of social support (i.e., family, friends and significant other). The alpha reliability is .92. Belongingness was measured by the Social Connectedness Scale (Lee & Robbins, 1995). Its alpha reliability is .86. Self-esteem was measured with Rosenberg's Self-Esteem Scale (Rosenberg, 1965). It is a 10-item scale to measure overall feelings of self-worth or self-acceptance. Its alpha reliability is .89. All scale items were

rated on a 5-point Likert-scale ranging from 1 (Strongly disagree) to 5 (Strongly agree).

Data analysis

In this study, multiple regression was used to analyze the relationships of the seven social-emotional factors with older adults' online social interactions. Previous studies have shown that physical health and financial security are important factors that affect successful aging and life satisfaction (Abu-Bader, Rogers, & Barusch, 2002; Lee, Lan, & Yen, 2011). So, controlling for physical health and financial status, a series of hierarchical regression analyses were performed, using each of the socio-emotional factors as outcome variable, and the amount of Internet use and the measures of online activities as independent variables. By convention, R^2 values of .02, .13, and .26 might be considered to be small, medium, and large respectively (Cohen, 1988). To understand the interrelationships of the sets of variables, a canonical correlation analysis was also conducted. All regression analyses were carried out with an alpha level of .05.

Results

A two-stage hierarchical linear regression analysis was used to predict the level of the social-emotional benefits among older adults separately. In the first block, physical health and financial status were entered as covariates; in the second block, the amount of Internet use, communicating with family, communicating with friends and meeting new people online were simultaneously entered.

Bridging and bonding social capital. For bridging social capital, physical health and financial status were not significant covariates (see Table1), F (2, 78) = 1.03, p = .36. **When the four variables of Internet use were added to the block, the second prediction mode was statistically significant, F (6, 74) = 2.38, p = .04, R^2 = .16. The R^2 change was also statistically significant, F_c (4, 74) = 3.01, p_c = .02, R_c^2 = .13, and the four variables accounted for 13% of total variance.The strongest predictor is meeting new people online. Based on the structure coefficients, it appears that the latent variable described by the model was best indicated by meeting new people online. However, for bonding social capital, both the first (F (2, 77) = 1.36, p = .26) and the second (F (6, 73) = 0.61, p = .72) model were not statistically significant.**

Table 1. Hierarchical Regression Results for Bridging Social Capital

Block	R^2	Model	b	SE-b	B	r	sr^2	sc
1	.03	Constant	11.34	1.88				
		Physical health	-.13	.47	-.03	-.05		
		Financial status	.005	.004	1.54	.16		
2	.16	Constant	7.87	3.03				
		Physical health	-.04	.47	-.01	-.05	<.001	-.12
		Financial status	.002	.004	.06	.16	.003	.39
		Amount of Internet use	.23	.18	.14	.16	.02	.39
		Communicating with family	-.52	.54	-.13	-.08	.01	-.20
		Communicating with friends	.46	.58	.11	.08	.01	.20
		Meeting new people online*	1.38	.47	.32	.34	.10	.85

Note. sr^2 = squared semi-partial correlation; sc = structure coefficient.

Loneliness. Physical health and financial status were not significant covariates (see Table 2), F (2, 79) = 1.61, p = .21. When the four variables of Internet use were added to the block, the prediction mode was statistically significant, F (6, 75) = 2.91, p =.01, R^2 = .19, and about 19% of total variance was explained. The variance explained by the four variables of Internet use was also statistically significant, F_c (4, 75) = 3.47, p_c = .01, R_c^2 = .15. Based on the squared semi-partial correlations, it appears that loneliness was primarily predicted by communicating with friends. Higher frequency of using Internet to communicate with friends was associated with lower level of loneliness.

Table 2. *Hierarchical Regression Results for Loneliness*

Block	R^2	Model	b	SE-b	B	r	sr^2	sc
1	.04	Constant	26.65	2.52				
		Physical health	1.13	.63	.20	.19		
		Financial status	.002	.01	.05	.02		
2	.19	Constant	20.62	3.89				
		Physical health	1.21	.62	.21	.19	.04	.43
		Financial status	.003	.01	.07	.02	.004	.05
		Amount of Internet use	-.12	.24	-.05	-.04	.003	-.09
		Communicating with family	.48	.70	.10	.25	.005	.57
		Communicating with friends*	1.69	.76	.31	.34	.05	.77
		Meeting new people online	-.83	.62	-.14	-.11	.02	-.05

Note. sr^2 = squared semi-partial correlation; sc = structure coefficient.

Belongingness. When Physical health and financial status were entered, the first model was not statistically significant (see Table 3), F (2, 79) = 1.76, p = .18. As the four variables of Internet use were added to the block, the prediction mode was statistically significant, F (6, 75) = 2.94, p =.01, R^2 = 19, and this model accounted for 19% of total variance. The variance explained by the four variables of Internet use was also statistically significant, F_c (4, 75) = 3.43, p_c = .01, R_c^2 = .15. The strongest predictor of belongingness was communicating with friends. So, higher frequency of communicating with friends was associated with higher level of belongingness.

Table 3. *Hierarchical Regression Results for Belongingness*

Block	R^2	Model	b	SE-b	B	r	sr^2	sc
1	.04	Constant	19.47	1.90				
		Physical health	.88	.48	.21	.20		
		Financial status	.002	.004	.06	.03		
2	.19	Constant	14.21	2.93				
		Physical health	.92	.47	.21	.20	.04	.46
		Financial status	.002	.004	.05	.03	.002	.07
		Amount of Internet use	.002	.18	.001	.02	.000	.05
		Communicating with family	-.085	.53	-.02	.19	.003	.43
		Communicating with friends*	1.66	.57	.40	.37	.09	.85
		Meeting new people online	-.31	.47	-.07	-.04	.005	-.09

Note. sr^2 = squared semi-partial correlation; sc = structure coefficient.

Self-esteem. Physical health and financial status were not significant covariates (see Table 4), F (2, 79) = 0.61, p = .54. When the four variables of Internet use were added to the block, the prediction mode was not statistically significant as well, F (6, 75) = 2.02, p = .07, R^2 = .14. However, the variance explained by the four variables of Internet use was statistically significant, F_c (4, 75) = 2.70, p_c =.04, R_c^2 = .12, and self-esteem was primarily predicted by meeting new people online and to a less extent by communicating with friends.

For depression, physical health and financial status were significant covariates, F (2, 79) = 3.78, p = .03, but when the variables of Internet use were entered in the model, the R^2 change was not statistically significant, F_c (4, 75) = 0.31, p_c = .87 and the model was not significant as well, F (6, 75) = 1.42, p = .22. For social support, both the first (F (2, 79) = 1.31, p =.28) and the second (F (6, 75) = 1.35, p = .26) model were not significant.

Table 4. *Hierarchical Regression Results for Self-esteem*

Block	R^2	Model	b	SE-b	B	r	sr^2	sc
1	.02	Constant	36.81	2.79				
		Physical health	.76	.70	.12	.12		
		Financial status	.002	.01	.04	.03		
2	.14	Constant	33.71	4.38				
		Physical health	.75	.70	.12	.12	.01	.31
		Financial status	.01	.01	.09	.03	.01	.07
		Amount of Internet use	-.26	.27	-.11	-.08	.01	-.23
		Communicating with family	.57	.79	.10	.22	.01	.58
		Communicating with friends	1.30	.86	.22	.25	.03	.66
		Meeting new people online	-1.35	.70	-.22	-.18	.04	-.49

Note. sr^2 = squared semi-partial correlation; sc = structure coefficient.

Results of canonical correlation analysis

Canonical correlation analysis was used to explore the relationships between the set of Internet use variables and the set of significant social-emotional variables. The dependent variables were bridging social capital, loneliness, belongingness and self-esteem. The predictor variables were the amount of Internet use, communicating with family, communicating with friends and meeting new people online. With 81 cases in the analysis, the relationship between the sets of variables was statistically significant, Wilks' lambda = .64, R_c^2 = .36, approximate F (16, 223.66) = 2.16, p = .01. All the four functions were extracted. The first function accounted for approximately 54.22% of the explained variance, and the second function added 44.19% to that. The dimension reduction analysis indicated that only the first function was statistically significant, which was interpreted in this study.

The structure coefficients for the first function for the predictor and dependent variables are shown in Table 5. The first predictor canonical variate was indicated primarily by lower frequency of meeting new people online and seconded by less amount of Internet use; the first dependent canonical variate was predominately associated with lower level of bridging social capital. Taken together, the first function appears to indicate that meeting new people online and great amount of Internet use is predictive of bridging social capital.

Table 5. *Structure Coefficients for the First Predictor and Dependent Canonical Variates*

Predictor Variable	Function 1	Dependent Variable	Function 1
Amount of Internet use	-.44	Bridging social capital	-.86
Communicating with family	.21	Loneliness	.14
Communicating with friends	-.29	Belongingness	-.15
Meeting new people online	-.80	Self-esteem	.35

Discussion

This study examined the social and emotional impacts of Internet use on older adults. With physical health and financial status as covariates, the findings suggest that older adults‘ online social activities were positively related to bridging social capital, belongingness and self-esteem, and negatively associated with the feeling of loneliness. Based on Cohen's (1988) rule, the magnitudes of the changed R^2 values were medium (.12-.15). Prior research has shown that older adults with high engagement in social interaction report more positive wellbeing. A common idea is that the more opportunities an individual has to interact with other people, the more social support will be available, which, in turn, will have a beneficial effect on general wellbeing. The buffering hypothesis indicates that the existence of one's social network as well as substantive interactions generated among social ties can buffer people from negative life events (Cohen & Wills, 1985). Consistent with previous findings and theories, the results of this study indcate that using the Internet to communicate with family and friends, and meet new people contributes to older adults' social and emotional wellbeing. In addition, it is noted that amount of Internet use wasn't associated with any of the seven social and emotional measures (all $p > .05$). This is also consistent with previous research reporting that the impacts of Internet use may vary as a function of the type, amount, timing and function of Internet use (Cotten et al., 2012; Cotten et al., 2013).

Social capital has become a key concept in analyzing personal interactions and relationships in online communities. Williams (2007) found that Internet use was associated with more online bridging social capital but offline bonding social capital was less. Uncompaible with Williams‘ finding, this study found participants reported low level of bridging social capital, and its average score was lower than a neutral 3 on the 5-item Likert-type scale. In addition, results of the hierarchical regression and canonical correlation analysis indicate that higher frequency of using the Internet to meet new people was associated with a higher level of bridging social capital. However, the descriptive data indicated that the majority of older adults never used the Internet to meet new people. Even though meeting new people online was positively associated with bridging social capital, the Internet was not an effective way for older adults to establish new relationships. Compatible with the findings in previous studies, this study found that the common use of the Internet among older adults is to communicate with family and real-life friends. Thus, for older adults, the Internet may be better at strengthening established, deep offline relationships than developing new online relationships.

In addition, data analysis revealed that none of the independent variables was associated with bonding social capital. This result is

reasonable. Bonding social capital resides in deep interpersonal relationships. This study only measured how frequently participants used the Internet to communicate with family and friends and meet new people online, but the frequency of communicating with others doesn't indicate the intention or content of these online activities. Communicating with others does not automatically create a deep social bond among them. It is unclear whether these interactions are social-emotional. Therefore, future study should examine whether the quality or depth of online interpersonal relationships is associated with older adults' social and emotional wellbeing.

To summarize, this study found that online social activities were associated with some social and emotional benefits for older adults. However, there are several actual and potential barriers to sustained technology use by older adults. Among retired people in the UK, "just not interested" was the most common reason and "Do not know how to use" was the second most common reason for not using the Internet and giving up using it (CARDI, 2012). Wagner, Hassanein and Head (2012) found that the reason for non-use or barriers to computer use by older adults is the lack of perceived benefit that deters older adults from using new technologies. Older adults are willing to use technology when usefulness and usability outweighs feelings of inadequacy (Heinz et al., 2013). The fact that older adults makes up the fastest growing consumer segment of Internet users suggests that older adults will have higher levels of Internet experience and increasingly diverse usage patterns. The extent to which these changes affect their social and emotional life still remains unclear.

One limitation of this study is that the sample size is small and the sample is local. Participants were recruited from community seniors' centres in Vancouver, Canada. The participants didn't include those from independent apartment complexes, assisted living centers and rural communities, which may affect the study results. Another limitation is the basic measures of online social activities. As reported in previous research, older adults have used social media such as Facebook, Twitter, Skype, and LinkedIn, to communicate with family and friends (Madden, 2010). Different online social activities differ from each other in terms of the intensity and mechanism of social interactions. Therefore, the motivation, device (e.g., computer, tablet and mobile phone), communication tools (e.g., email, Facebook) and quality of communication should be measured to examine how these variables are associated with potential social and emotional benefits. This might reveal specific ways through which Internet use affects older adults' wellbeing.

Conclusion

Through the ubiquity of technology in all domains of life, Internet use has become an essential part of older adults' lives. Contradictory to the stereotype of older adults being afraid and unwilling to use technology, research has shown that older adults perceive positive outcomes (i.e., connection with family and friends and increased independence) of some widely adopted technologies such as computer, cell phone, and Internet(Adams et al., 2005; Mitzner et al., 2010). This study contributes to the work in this area by showing that using Internet to communicate with family and friends can enhance older adults' social interaction, decrease loneliness and increase belongingness and self-esteem. However, larger-scale research in this area is needed. The evidence and guidelines for practice that will result are expected to benefit not only older adults, but also their families, communities and societies-at-large.

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