Do Social Networking Sites build and maintain social capital online in rural communities?

ABSTRACT

Social capital (SC) is a cornerstone of rural communities but is not well understood in terms of how Social Networking Sites (SNS) can be used to build and maintain SC online. There are limited studies which have attempted to measure SC online and its two distinct dimensions – bonding and bridging SC. The main objectives of this paper are to: (i) confirm that building and maintaining of SC online can be measured reliably and validly as two factors of bonding and bridging SC, and (ii) to determine to what extent the use of SNS facilitates building and maintaining bonding and bridging SC online when rural households have broadband connectivity. This study used a large-scale survey to collect quantitative data in the Western Downs Region of Queensland, Australia regarding households' adoption and use of broadband Internet including use of SNS and their contribution to building and maintaining bonding and bridging SC online in rural communities. This study confirmed that SC online can be reliably and validly measured as a first order two-factor hierarchical model providing further support for the findings of previous empirical studies. Evaluating the association between SNS use and building and maintaining bonding and bridging SC online in rural communities showed that Heavy and Light users of SNS in rural communities are more likely to have higher levels of bonding and bridging SC online than Non-users of SNS. The findings also suggest that higher levels of SNS use are more effective in building and maintaining bridging SC online than bonding SC online. This suggests that SNS usages may be able to play an important role in building and maintaining SC and improving social connectivity both within rural communities such as WDR and more widely with other communities regardless of geographical location. This is despite the tyranny of distance and poor telecommunications which has historically been a communication barrier for rural communities.

1 Introduction

There is a growing global recognition of the discrete benefits that Social Media (SM) can bring as a mechanism to overcome the tyranny of distance as a rural disadvantage in communication, and to promote social well-being and to build and maintain Social Capital (SC) in rural communities (Warburton et al., 2013). Howard (2012) argue that SNSs such as Facebook, Instagram, LinkedIn and Twitter which are an important subset of SM provide a set of online communication tools and services which facilitate connecting and sharing knowledge, hobbies, news and events and provide a platform for online conversation with other users by creating a personal network. Furthermore, Mossberger et al. (2013) suggest that the functionality of SNS allows users to engage in social activities and build and maintain their social networks online as well as in offline settings among family, friends and professional colleagues. Despite the growing popularity of SNS which have created new ways of collaboration and communication in society, there is lack of empirical studies on its use and role in building and maintaining social connections (social capital) online in rural communities (Ellison et al., 2014; Warren et al., 2014; Williams, 2006). Moreover, most studies focus on how SNSs can build and maintain SC among younger people in schools, universities and particularly in urban locations (Ahn, 2012; Chowdhury et al., 2012; Ellison et al., 2006). Limited empirical studies have examined how SNSs can build and maintain SC in rural communities across a broad range of people in terms of age, education and income, however none examined this issue for the two distinct constructs of bonding and bridging SC.

The purpose of this paper is to (i) confirm that SC online can be measured reliably and validly as two factors: bonding and bridging SC in a rural context and then (ii) determine to what extent

SNS can build and maintain bonding and bridging SC online for households in rural communities. Choosing rural communities in the Western Downs Region of Queensland, Australia as a case study is interesting and important because of the digital divide and geographical isolation that is more likely to exist in rural areas in comparison to urban areas (Blank & Lutz, 2017; Johnstone, 2017; Park, 2017).

This paper is organized as follows. Firstly, we discuss rural communities and the importance of SC. Then, we present the previous literature on two dimensions of SC: bonding and bridging SC. Then the role of SNS in building and maintaining bonding and bridging SC online in rural communities. Next, the research methodology used to collect and analyse empirical data to test the hypotheses proposed in this research is described and justified. The key findings regarding the measurement of SC online modelled as a first order two factor hierarchical model and the impact of SNS use on bonding and bridging SC online in rural communities is presented and discussed. Finally, the contributions and implications of this research for theory and practice regarding the measurement of SC online and the extent to which bonding and bridging SC can be built and maintained using SNS are highlighted and discussed.

2   Rural communities
Rural areas have been left behind in terms of development even though these are often a major source of export earnings, traditionally through agricultural and resources sectors (Batt, 2015). A number of factors such as income, living cost, and poor access to education, health and communication services indicate that there are significant disadvantages to living in a rural area in comparison to an urban area (Cheers, 1998; Wiesinger, 2007). Increasingly there is inadequate provision of federal and state government services in rural areas. Previous research show that people who live in rural communities usually have good relationships and there is higher levels of trust in rural communities because they know all or most neighbors in their community (Best Start Resource Centre 2010; Onyx & Bullen, 2000). Most of the people in

these rural communities participate in various community groups with a common interest such as art, craft, community support and sporting groups (Alston, 2002). Communities are greater than the sum of their parts. Rather than simply an aggregate of individuals, communities are characterized by the relationships, networks, activities, and functions that individuals create and build together. These rural communities through working together in groups help to build strong connections and SC among them. Previous studies shows that rural communities are founded on strong SC at the community level (Hofferth & Iceland, 1998; Warburton et al., 2013; Williams, 2006), however, there is little empirical research on how SC can be built and maintained online in rural communities using SNS.

3   Social Capital

Despite the lack of a consensus on a precise definition, the term 'social capital' is extensively accepted and used as a multidimensional concept (Warburton et al., 2013). An extensive review of literature shows that researchers have defined the construct of SC in terms of social networks, trust, civic engagement, life satisfaction and other concepts (Bourdieu, 1985; Coleman, 1988; Lin, 2002; Putnam, 2001). Moreover, the basic idea of SC is as simple as the resources available to access and use by individuals or groups of people through social interactions and communication among communities. Williams (2006) notes that being online provides opportunities for social activity both in real and offline life. However, there is also some contention as to whether being online results in a net gain in SC or whether being online might actually diminish SC in some instances overall. Theory of SC is based on two primary driving forces that account for most individuals actions, and can be classified as expressive actions (bonding) and instrumental actions (bridging) (Lin, 1999).

Expressive actions which are representative of bonding capital endeavor to maintain valued resources, to preserve and defend resources already at an individual's disposal. Bonding capital is generated and shared by members of a relatively homogenous group, in terms of the strong

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or close ties of similar groups of people founded by shared values, accepted thoughts and social norms, such as families, relatives, friends or neighborhood groups (Warburton et al., 2013; Woodhouse, 2006). The resources that are available through one's strong ties correspond to bonding capital. Strong ties tend to be the source of primary personal interaction and support (Hampton, 2011; Haythornthwaite, 2005; Straits, 2000). A typical expressive action that illustrates how bonding capital can be maintained would be to confide one's feelings with a family member or friend via SNS. Bonding SC provides personal, social and emotional support (e.g. look after someone when they do not feel good or feel sick), which plays a key role in maintaining close relations (Lin, 2002).

On the other hand, instrumental actions which are representative of bridging capital seek to gain valued resources, by promoting actions to undertake to gain resources not already at an individual's disposal. Bridging SC is generated and shared through interconnections between heterogeneous groups and more diverse, i.e. weak ties. So, bridging SC allows individuals to access resources not available in their close social networks. Bridging SC is useful to gain resources, i.e. for instrumental actions such as finding a job (Lin, 2002). Bridging SC draws on outside or peripheral knowledge, resources and ideas that can help communities interconnect and build SC with other communities. Weak ties are more crosscutting than strong ties and present a lower level of homophile when compared with strong ties (Hampton, 2011).

On the other hand, Norris (2004) suggest that the Internet use helps to create and maintain social networks and plays an important role in building and maintaining bonding and bridging SC in communities. Furthermore, Williams (2006) found that being online provides opportunities to connect with families, friends and other people from and beyond the communities. Alam and Imran (2015) and Wallace et al. (2017) found that the use of digital technologies is associated with SC and cognitive factors as social inequalities can decrease through access to ICT, its affordability, skills and choice to use it. The concepts of bonding and

bridging SC are based on similar norms of trust and reciprocity which has capacity to build and maintain networks or groups in order to be connected in rich social networks (Warburton et al., 2013; Woodhouse, 2006). Trust in the context of SC could be thick or thin with other people (including outsiders) in the wider society (Putnam, 2001). Bonding SC is characterised as having dense, multi-functional ties, longer reciprocity and strong or thick trust (Darcy et al., 2014). Whereas bridging SC is based on large weak networks with relatively strict reciprocity and thinner trust (Onyx & Bullen, 2000). Moreover, Putnam (2001) suggests that bonding and bridging SC are related but not equivalent. The literature suggests that SC consists of two distinct dimensions: bonding and bridging that can be built and maintained online. Hence, the literature provides support for the following hypothesis:

H1: SC online can be modelled as two factors: Bonding and Bridging SC.

4   Social Media

The growth of SM has emerged in last 15 years, and its impact has been both rapid and dramatic, changing the purpose and the functionality of the Internet (Dong et al., 2017; Lamberton & Stephen, 2016). SM are now used for different reasons by various user communities (ITU, 2014). The use of SM can range from general chit-chat to propagating breaking news, from scheduling a date to following election results or coordinating a disaster response, from sharing gentle humor to communicating serious research globally. Kaplan and Haenlein (2010) suggest that in today's world everything is about social media, they further added that some industry gurus claim that if you do not participate in SM such as Facebook you are not part of cyberspace anymore. SM are websites or online communication tools and services that allow to uses the internet to facilitate conversations and connection between friends, peers and collaborations to share knowledge, opinion and news (Howard, 2012). SM can be categorised as: SNSs (Facebook, LinkedIn), Video and photo sharing (Instagram), Blogs and Micro-blogging (Twitter) and Forums. The most popular and commonly used SM is SNS.

4.1 Social Networking Sites: Building and maintaining Social Capital in Rural
  Communities

A SNS is an important subset and one of the most widely used SM. Boyd and Ellison (2008, p. 211) define SNS as "web-based services that allow individuals to (i) construct a public or semi-public profile within a bounded system, (ii) articulate a list of other users with whom they share a connection, and (iii) view and traverse their list of connections and those made by others within the system". Facebook has over 2 billion monthly active users worldwide (Facebook, 2017). Facebook is widely used for connecting family, friends, and friends of friends through its online social network. Linkedin has become prominent amongst professional people and has more than 800 million active users (LinkedIn, 2017). However, Linkedin does not differeniate between paid and free users of Linkedin.com and does not indicate if these statistics constitute active monthly users. Instagram, a photo sharing social media application, has over 700 million monthly active users where users express their thoughts and status by sharing pictures or photos (Instagram, 2017). Twitter is a microblogging platform and people usually follow twits to get immediate updates on recent news and current affairs. Twitter has over 330 million monthly active users (Twitter, 2017). Although Instagram and Twitter can be classified as a different type of SM they are generally referred to as a SNS because of their interactive functionality.

The use of SNS can lead to increased contact and maintenance of connections either online or offline 24/7 days among family, friends and relatives who live far away from families or live in other rural communities. These connections help to build and maintain bonding SC in rural communities. According to Granovetter (1973), bonding SC consists of strong-tie relationships, which are associated with a great amount of time spent together with close family and friends, and ensuing emotional intensity, intimacy, and sharing of reciprocal services. A number of previous studies found that there are positive relationships between SNS use and

bonding SC. Ellison et al. (2007), for example, found a positive relationship between Facebook intensity use and bonding SC, where the intensity was typically defined as the frequency and duration of Facebook use, and attitude toward, and the habits associated with Facebook. Other studies, Lampe et al. (2013) for example, found that heavy Facebook users reported higher bonding SC than light Facebook users, which suggests that Facebook use may facilitate accessing the social resources associated with bonding SC. Hence online communication, connection and engagement with strong ties could be facilitated by the level of SNS use which suggests that bonding SC could be built and maintained online more effectively in rural communities through the use of SNS. Hence the literature supports the following hypothesis.

H2: Households in rural communities that are Heavy users of SNS will build and maintain higher levels of bonding SC online than households in rural communities that are Light users or Non-users of SNS.

Broadcasting communication and passive consumption of social news and undirected messages are one of the novel features of SNS where one reads and others update. Some of the features such as news feeds are a general broadcast which allow sharing of status updates, links, photos, public interactions between friends and friends of friends which helps to build networks among communities. Some scholars are of the opinion that SNS are more suitable for informal communication between weak ties (Zhao & Rosson, 2009) but many users start using SNS for formal communication with weak ties as well. For example political leaders who use SNS to forward their opinions or beliefs to the general public (Bronstein & Aharony, 2015). SNS are also being increasingly used for sending invitations or to promote events and functions (Rebelo & Alturas, 2011). SNS allows individuals to access information such as events in communities and raise the alarm and seek help during natural disasters (Vieweg et al., 2010). More importantly SNS can create opportunities for members such as alerting them of jobs which are shared by network friends, being able to get references that are otherwise unavailable. So

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building networks and connections among communities is very important role of SNS. Several empirical studies highlight that bridging SC, with the associated benefits of enhanced social participation and social inclusion can reduce social isolation (Burke et al., 2011; Gray et al., 2006; Steinfield et al., 2008). This has particular importance in rural communities, bridging SC might be augmented by the use of SNS such as Facebook, Linkedin and Twitter which can enable users to create and maintain larger and more diffuse networks of relationships from which they could potentially draw resources (Donath & Boyd, 2004; Resnick, 2001; Wellman et al., 2001). Differences in bridging SC have also been found between SNS users and non-users. In a longitudinal study, Brandtzaeg (2012) compared SNS users with non-users. The results showed that Facebook users have greater bridging SC than a non-user. Lampe et al. (2013) define and categorized SNS among non-users, light and heavy users. They found that light and non-use of the SNS Facebook was associated with lower levels of bridging SC. A number of previous studies found that the level of use of SNSs like Facebook, Linkedin and Twitter has a positive relationship with bridging SC (Hofer & Aubert, 2013; Phua et al., 2017). Hence, the literature supports the following hypothesis:

H3: Households in rural communities that are Heavy users of SNS will build and maintain higher levels of bridging SC online than households in rural communities that are Light users or Non-users of SNS.

Figure 1 provides a conceptual model of the three hypothesised relationships tested and reported on in this paper.
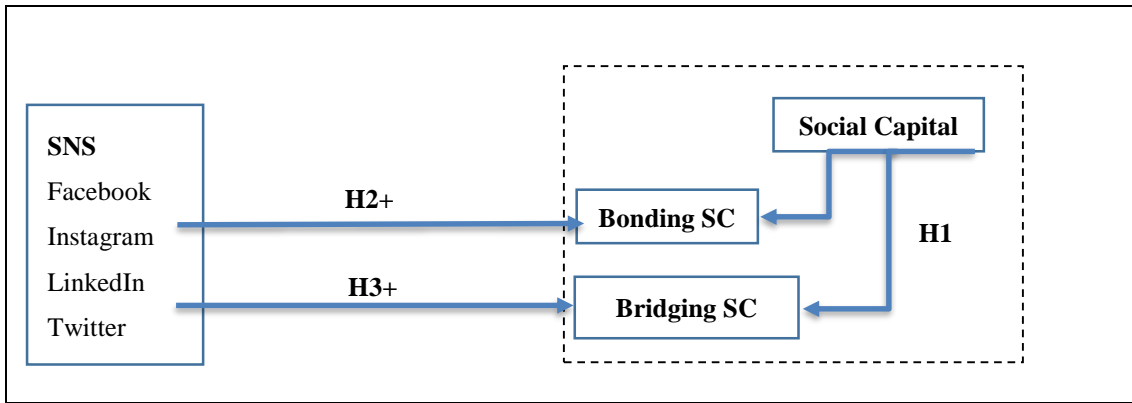
Fig. 1. Use of SNSs builds and maintains social capital (Bonding SC, Bridging SC) online in rural communities

5 Methodology

This research conducted a large-scale quantitative survey in the Western Downs Region (WDR), Queensland, Australia of households' experiences with their adoption and use of broadband Internet including their use of SM and SNSs and its impact on their SC. The WDR covers a land area of 38,039 square kilometers and has a population of 34,197 (as at 2016) making it 20th largest council in Queensland in terms of area. The population of the WDR (see figure 2) is concentrated in the three largest towns, namely Dalby, Chinchilla and Miles with the rest of population dispersed across a number of smaller towns and rural districts. The natural distribution of population in the WDR makes it a representative sample of rural Australia and an ideal setting for studying the measurement of SC online and impact of SNS on building and maintaining SC online in rural communities.

Figure 2: Showing study area - Western Downs Region, Queensland, Australia (Source: (AWD, 2017; Wikipedia, 2017))

The survey sample population of 1,500 households was randomly selected from the main population localities and surrounding rural areas in the WDR using a stratified sampling approach (Explorable.com, 2009; Lærd Dissertation 2012; Sandelowski, 2000). A stratified sampling approach ensured adequate coverage across main population localities and surrounding rural areas in the region.

The survey instrument was developed from a number of previous survey instruments including an instrument for measuring SC online in the context of SNSs (Ellison et al., 2007; Neves, 2013; Williams, 2006). Using previously tested survey instruments increases the validity and reliability of survey results (Straub et al., 2004). The survey instrument was pretested with a number of academics experienced with survey research design. The full survey was piloted with a number of households who reside in the WDR before conducting the main data collection phase. The targeted respondent was the major decision maker in each household as

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they were considered the most appropriate person to complete the survey questionnaire from a household perspective. The survey instrument is available on request from the authors.

The survey data was analysed using statistical data analysis software (SPSS and R packages). Common Method Bias (CMB) is a major systematic contributor to measurement error in survey research (Bagozzi & Yi, 1991). Podsakoff et al. (2003) advise that the likelihood of CMB ocurring can be minimised at the ex-ante stage by careful design of the survey questionnaire. In this study, the order of the questions measuring the research constructs were mixed and different scale types were used to help reduce the likelihood of CMB occuring. To test ex-post for CMB, Harman's single factor test was conducted by running an un-rotated exploratory factor analysis constrained to a single-factor in SPSS (Roni, 2014). The variance of 30.56% explained by the single factor was less than the 50% cut-off point, which shows that CMB is not a major concern and has minimal effect in this study. Therefore we had confidence that the findings of the survey results were not contaminated by CMB (Craighead et al., 2011).

Partial Least Squares Structural Equation Modelling (PLS-SEM) was used to conduct a confirmatory factor analysis for hypothesis H1 to assess the reliability and factorial validity (convergent and discriminant validity) of the measurement of SC online (Gefen & Straub, 2005; Tenenhaus et al., 2005; Wetzels et al., 2009) which was prespecified priori from existing literature as a first order two factor hierachical model: bonding and bridging SC. Wetzels et al. (2009) suggest that PLS-SEM is a more suitable approach than co-variance SEM for estimating the parameters in hierarchical latent variable models. With PLS-SEM, a higher order latent variable can be specified using the same manifest variables that specified a lower order latent variable. Hence, manifest variables are used twice: for the underlying first order latent variables, bonding SC and bridging SC (primary loadings) and for the second order latent variable, SC online (secondary loadings). Having specified the outer model (measurement model), the inner model (structural model) accounts for the hierarchical component of the

modelling of SC online as it represents the loadings of the first order latent variables bonding SC and bridging SC on the second order latent variable SC online. This allowed us to calculate the beta coefficients of bonding SC and bridging SC in relation to SC online and its R Square and the global fit of the first order two factor hierarchical model of SC online.

We then used a one-way ANOVA Test so that we could examine the hypotheses H2 and H3 to determine if there were statistically significant differences in the aggregate mean scores for bonding SC and bridging SC online of three independent groups: Heavy, Light and Non- users of SNS (Laerd Statistics 2017). In this study we categorised SNS users into three independent groups based on the respondent's indication of the extent of their involvement with one or more different SNSs and their frequency of Internet use. If users had more than two or more different SNS accounts and are frequent Internet user they were classified as a Heavy user of SNS, else they were classified as Light users similar to the methodology followed by (Lampe et al., 2013). Those who did not have a SNS account were classified as a Non- user of SNS.

6   Results

6.1 Demographics of survey respondents and their households

The survey achieved a response rate of about 21 Percent. The 315 complete and usable survey responses were found to be representative of the population distribution across the localities and surrounding rural areas in WDR.

For survey respondents, the lowest representations in age categories were 18- 24 years (3%) and over 75 years (2%). The age category of 45- 54 years represented the largest group of respondents (24%), followed by 35-44 years (20%), 25- 34 years (16%), 55-64 years (14%) and 65-74 years (10%) respectively of respondents. Twelve percent of respondents did not provide their age group. A total of 210 (67%) male and 100 (32%) female respondents completed and returned the questionnaire. A total of 5 (2%) respondents did not disclose their

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gender. Almost half of survey respondents 152 (48%) classified their household as a couple or family with children at home, followed by 64 (20%) who classified their household as a couple or family with children not living at home, 14% classified their household as a couple/family with no children, 7% classified their household as a single parent with children at home, 7% classified their household as a single person living alone and 4% classified their household as a single person living with others.

Hundred and seventeen (38%) respondents indicated that their annual household income was between $20,000 and $59,999. One hundred and twenty-three (39%) respondents had an annual household income in the middle range of between $60,000 and $120,000. In contrast, 61 (19%) respondents had a top end annual household income over $120,000. A total 14 (4%) respondents did not indicate their annual household income range. One hundred and forty-one respondents 141(45%) possessed a secondary school education as their highest level of education followed by 126 (41%) respondents whose highest education level was a Diploma, Undergraduate or Post Graduate degree. Only 25 (8%) had done some training courses and less than 3% have only primary education. The results of a descriptive analysis of the demographics of the respondent households show there is a good representation of a range of households in terms of age, type of household, income and education levels across rural communities in the WDR.

6.2 Results of confirmatory factor analysis for two dimensions of social capital – H1

H1: Social capital online can be modelled as two factors: Bonding and Bridging SC was tested in this study. For the online bonding SC survey items, the respondents were asked about whether they are building and maintaining bonding capital online through their strong tie networks such as family, friends and work colleagues. In other words, bonding SC facilitated exclusiveness through (i) emotional support, (ii) access to limited resources, (iii) ability to

mobilise solidarity, and (iv) encourage insular thinking resulting in out-group antagonism (Putnam, 2001; Williams, 2006). Survey respondents were then asked whether they are building and maintaining bridging SC online through their weak tie networks. In other words, bridging SC facilitated access to external assets and information diffusion through: (i) outward lookingness, (ii) contact with a broad range of people, (iii) a view of oneself as part of a broader group, and (iv) diffusing reciprocity with a broader community giving (Putnam, 2001; Williams, 2006). An assessment of the reliability, convergent validity and discriminant validity of the measurement model for SC online as a first order hierarchical two factor model (bonding SC, bridging SC) and second order one factor model are presented in Table 1. SC online was modelled a second order latent variable with bonding SC and bridging SC as first order latent variables. To assess the reliability of the measurement items for SC online (bonding SC, bridging SC) we calculated the composite reliability (CR) and average variance extracted (AVE). As shown in Table 1 CR exceeded 0.7 for both the first order and second order models. For the first order and second order models, the AVE of all measurement items exceeded the 0.50 cutoff. However, for the second order model, some of the factor loadings were less than 0.70 which suggests that SC online can be modelled more reliably and validly as a first order two factor hierarchical model consisting of bonding SC and bridging SC. The square root of the AVE exceeds the inter-correlations of the construct with other constructs in support of discriminant validity. Additional support for discriminant validity was confirmed by examining the cross loadings for each measurement item which were much less compared to the loadings for each construct (Hair et al., 2016; Henseler et al., 2015). The Goodness of fit (GoF) index for PLS path modeling was proposed by Tenenhaus et al. (2005) as a means for validating a PLS path model globally. The GoF index is calculated by the geometric mean of the average mean of the average communality and average R Square (endogenous constructs). The GoF index of 0.72 for the first order two factor hierarchical model indicated a large effect size of

the R Square for bonding SC and bridging SC on building and maintaining SC online. Hence, the validity and reliability of SC online as a first order two factor hierarchical model consisting of bonding and bridging SC were confirmed by the analysis in this study before running the ANOVA tests to examine hypotheses H2 and H3 to determine if the level of SNS use was associated with the bonding and bridging SC online mean scores.

	Dimensions of Social Capital	Items Statements	Means	SD	Ist Order Factor loadings	2nd Order Factor loadings	CR	AVE	R Square	H₁ Beta coefficients
Social Capital	**Bonding Capital**					SC	0.89	0.53	0.84	0.91 (6.16***)
Second Order Factor	**BO_C1**	There are several people online my household trust to help solve our problems.	4.04	1.79	0.71	0.64				
CR 0.95	**BO_C2**	There is someone online my household can turn to for advice about making very important decisions.	3.89	1.80	0.76	0.63				
AVE 0.54	**BO_C4**	When someone in my household feels lonely, there are several people online we can talk to.	3.95	1.90	0.80	0.72				
	BO_C5	If my household needed an emergency loan of $500, we know someone online we can turn to.	3.11	2.00	0.69	0.68				
	BO_C6	The people, my household interact with online would put their reputation on the line for my household.	3.43	1.79	0.71	0.66				
	BO_C7	The people my household interact with online would be good job references for my household.	3.76	1.79	0.78	0.71				
	BO_C8	The people my household interact with online would share their last dollar with my household.	3.32	1.77	0.71	0.66				
	BO_C9 reversed	My household does not know any people online well enough to get them to do anything important.	3.93	2.00	0.63	0.57				
	BO_C10	The people my household interact with online would help my household fight an injustice.	4.00	1.80	0.76	0.69				
	Bridging Capital						0.96	0.72	0.95	0.97(7.49***)
	BR_C1	Interacting with people online makes my household interested in things that happen outside of our town.	4.87	1.71	0.86	0.78				
	BR_C2	Interacting with people online makes my household want to try new things.	4.65	1.69	0.85	0.77				
	BR_C3	Interacting with people online makes my household interested in what people unlike my household are thinking.	4.47	1.67	0.87	0.74				
	BR_C4	Talking with people online makes my household curious about other places in the world.	4.77	1.71	0.86	0.77				
	BR_C5	Interacting with people online makes my household feels like part of a larger community.	4.70	1.71	0.89	0.81				
	BR_C6	Interacting with people online makes my household feels connected to the bigger picture.	4.79	1.68	0.88	0.74				
	BR_C7	Interacting with people online reminds my household that everyone in the world is connected.	4.99	1.55	0.80	0.73				
	BR_C8	My household is willing to spend time to support general online community activities.	4.34	1.57	0.85	0.77				
	BR_C9	Interacting with people online gives my household new people to talk to.	4.39	1.67	0.84	0.76				
	BR_C10	Online, my household comes in contact with new people all the time.	3.74	1.71	0.73	0.66				

Table 1 Assessment of reliability and validity of Social Capital Online (Bonding and Bridging) as a first order two factor hierarchical model

6.3 Different types of SNS and categories of SNS users

Table 2 shows the frequency and types of SNS used by the respondent households.

Types of SNS	Count
Facebook	225 (71.4%)
Instagram	45 (14.3%)
LinkedIn	36 (11.4%)
Twitter	21 (6.7%)

Table 2. Type of SNS used by survey respondents

Table 2 shows that Facebook is most widely used SNS. Seventy one percent of survey respondents are using Facebook followed by Instagram (14.3%), LinkedIn (11.4%) and Twitter (6.7%). The survey respondents were categorized into Heavy, Light and Non-users based on their use of one or more different SNS and frequency of their Internet access (see Table 3).

Types of SNS-user	Count
Heavy-user	70 (22.2%)
Light user	160 (50.8%)
Non-user	85 (27%)

Table 3. Type of categories SNS users based on number of SNS accounts and frequency of Internet use

Table 3 shows that 22.2% of SNS users were classified as Heavy users, 50.8 % were classified as Light users whereas 27% were classified as non-users of SNS.

6.4   Social capital online (bonding, bridging) scores and SNS use

Figure 3 utilised box plots to graphically show the distribution and variation of bonding and bridging SC online mean scores (1 strongly disagree to 7 strongly agree) comparatively for Heavy, Light and Non-users of SNS.
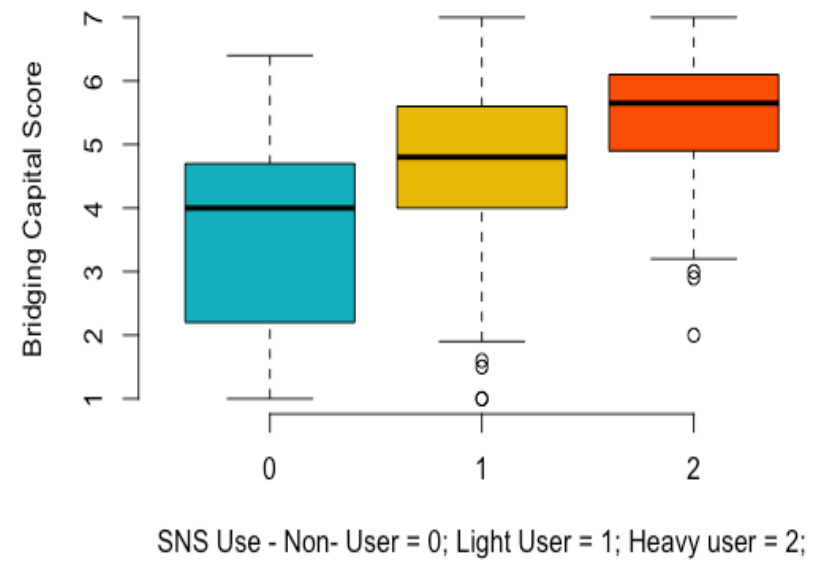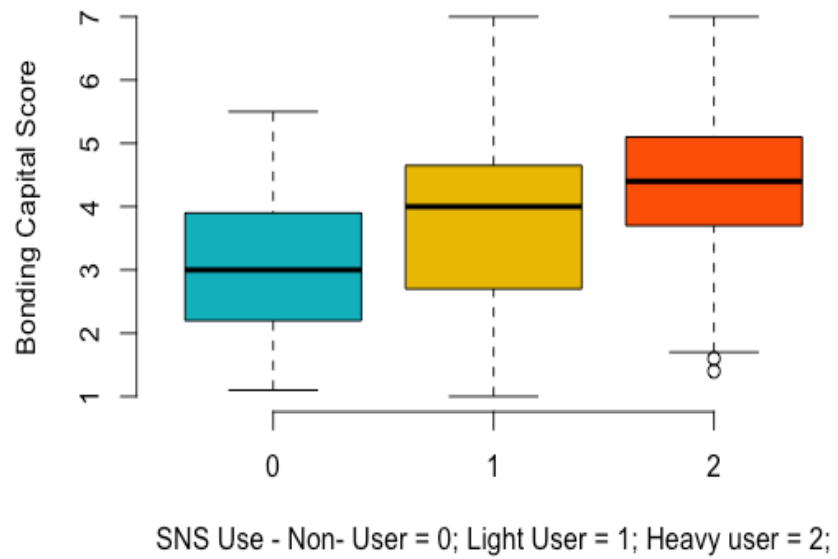
Figure 3 Distributions of Bonding SC and Bridging SC (online) mean scores for Heavy, Light and Non-users of SNS

Figure 3 graphically shows that most of the respondents who were Heavy SNS users had higher bonding and bridging SC online scores than Light and Non-users of SNS. For Non-users of SNS, bridging SC online mean scores were much lower and had greater variance. Conversely, Heavy and Light users of SNS had much higher mean scores with low variance for bridging SC online. For Non-users of SNS, bonding SC online mean scores were much lower although the variance in mean scores was similar to Light and Heavy users. In general, the mean scores for bonding SC online was lower across Non-users, Light and Heavy users of SNS than for bridging SC online. The findings suggest that SNS could be helping to build and maintain SC online overall in households at a higher level than the households of Non-users of SNS in rural communities. Furthermore, the mean scores and variation would suggest that SNS use is more effective in building and maintaining bridging SC online.

6.5 *ANOVA test for difference in Bonding and Bridging SC Online between Heavy, Light and non-users of SNS*

We tested Hypothesis **H2: Households in rural communities that are Heavy users of SNS will build and maintain higher levels of bonding SC online than households in rural communities that are Light users or Non-users of SNS.**

A one way ANOVA test was run to determine if there were differences among Heavy users, Light users and Non–SNS users in terms of their ratings of bonding SC online in rural communities. There were no outliers identified by a boxplot; data was normally distributed for each group, as assessed by the Shapiro-Wilk test ($p > .05$). However, there was an issue with homogeneity of variances, as assessed by Levene's test of homogeneity of variances ($p = .032$), hence we ran the alternative Welch test ($p=.000$). Data is presented as mean $\pm$ standard deviation. The bonding SC online mean score increased from Non-users (3.09 ±1.06) to Light users (3.79 ±1.41) to Heavy users (4.28 ±1.19) of SNS. There are significant differences between Heavy users, Light users and Non-users of SNS as evidenced in the results of a one-

way ANOVA (F (2,312) =17.313, p=.000). Given homogeneity of variances cannot be assumed, we ran the alternative Post Hoc Games-Howell Test. Table 4 presents the results of the Post Hoc Games-Howell Test and shows that the mean differences in bonding SC online between Heavy, Light and Non-users of SNS are significantly different. Again, the biggest difference in bonding SC online mean scores is clearly between Heavy users and Non-users of SNS.

SNS User groups comparisons	Difference between means	Lower 95% C.I.	Upper 95% C.I.	T-Value	DF	P Value adjusted
1-0 Light – Non-user	0.67	0.29	1.05	4.19	213.11	0.001***
2-0 Heavy – Non-user	1.17	0.74	1.61	6.40	139.34	0.001***
2-1 Heavy–Light-user	0.50	0.08	0.93	2.78	153.78	0.02*

*. The mean difference is significant at the 0.05 level.

We then tested Hypothesis **H3: Households in rural communities that are Heavy users of SNS will build and maintain higher levels of bridging SC online than households in rural communities that are Light users or Non-users of SNS.**

A one-way ANOVA test was run to determine if there were differences in the bridging SC online scores for the three groups of Heavy, Light and Non–users of SNS in terms of their ratings of bridging SC online in rural communities. There were no outliers identified by a boxplot; data was normally distributed for each group, as assessed by the Shapiro-Wilk test (p > .05). There was issue with homogeneity of variances, as assessed by Levene's test of homogeneity of variances (p = .000), so we could not assume the variances of means across the three groups are equal. Hence, we run the alternative Welch test (p=.000). Data is presented as mean ± standard deviation. SC mean score increased from Non-users (3.62 ±1.51) to Light users (4.70 ±1.25) to Heavy users (5.44 ±1.04) of the SNS users. There are significant differences between Heavy users, Light users and non-users of SNS as evidenced in the results of a one-way ANOVA (F (2,312) =40.187, p=.000. Given homogeneity of variances could not be assumed we ran the alternative Post Hoc Games-Howell Test. Table 5 presents the results of the Post Hoc Games-

Howell Test and shows that the mean differences in bridging SC online between Heavy, Light and Non-users of SNS are significantly different. The biggest difference in bridging SC online mean scores is clearly between Heavy users and Non-users of SNS but the difference in bridging SC online mean scores between Light users and Non-users is also clearly evident. This suggests that SNS use may be significantly influencing bridging SC online in rural communities.

SNS User groups comparisons	Difference between means	Lower 95% C.I.	Upper 95% C.I.	T-Value	DF	P Value adjusted
1-0 Light – Non user	1.05	0.59	1.51	5.44	144.31	0.001**
2-0 Heavy – Non-user	1.80	1.31	2.29	8.72	146.95	0.001**
2-1 Heavy–Light user	0.75	0.38	1.13	4.73	157.77	0.001**

*. The mean difference is significant at the 0.05 level.

Table 5 Post Hoc Games-Howell test – Bridging SC online by SNS user

These results suggest that the online SC of households in rural communities is built through the use of SNSs among household members as they are able to engage and connect online with both close and weak ties in their local and outside communities. In other words, SNS Heavy users would appear to have higher levels of online bonding and bridging SC than Light and Non-SNS users. The results of the hypotheses tested are summarized in Table 6.

Hypotheses	Result
H1: SC online can be modelled as two factors: Bonding and Bridging SC.	**Supported**
H2: Households in rural communities that are heavy users of SNS will build and maintain higher levels of bonding SC online than households in rural communities that are light users or non-users of SNS.	**Supported**
H3: Households in rural communities that are heavy users of SNS will build and maintain higher levels of bridging SC online than households in rural communities that are light users or non-users of SNS.	**Supported**

Table 6. Summary of the results of Hypothesis testing SNS builds and maintains SC (Bonding, Bridging) Online in Rural Communities

7   Discussion

H1: SC online can be modelled as two factors: Bonding and Bridging SC. This study confirmed that the instrument measuring online SC used by Williams (2006) and captured by the scales adapted for this study was proven to be reliable and valid. Furthermore, this study demonstrated that online SC can be modelled with confidence as a first order two factor hierarchical model consisting of bonding SC and bridging SC.

For bridging SC online, the survey item "interacting with people online reminds my household that everyone in the world is connected" was considered the most important item by the survey respondents (M=4.99 and SD=1.55). This statement highlights the power of being online and connected potentially to a global audience through SNSs. In contrast, the survey item "my household is willing to spend time to support general online community activities", (M=4.34 and SD=1.57, on a seven-point Likert scale) was rated least important item for bridging SC online. Interestingly, this is still clearly a positive rating and indicates being online and connected to people through SNSs can have a positive impact on the bridging SC of households in rural communities.

In contrast, items measuring bonding SC online had relatively lower mean values compared to bridging SC online in the survey responses. For bonding SC online, the survey item "there are several people online my household trust to help solve our problems" was considered the most important item by the survey respondents (M= 4.04 and SD=1.79). This would suggest that households use SNS to communicate with close ties such as family and friends that they have strong trust in, to help solve their problems. In contrast the survey item "if my household needed an emergency loan of $500, we know someone online we can turn to", (M=3.11 and SD=2.00, on a seven-point Likert scale) was considered the least important item for online bonding SC. This might be because people would only borrow money for an emergency from someone in person and SNS would not be used as a mechanism for facilitating such a sensitive situation.

The SNSs are just another communication tool for maintaining these close ties, an extension but not a replacement for face-to-face communications. The higher positive rating of bridging SC online comparative to bonding SC online by households in rural communities was also evident in our findings in relation to the results of the Hypotheses tested – H2 and H3.

Hypotheses H2 and H3: This study identified SNS use as a significant factor associated with building and maintaining bonding and bridging SC online in rural communities such as in the WDR. Results overall support the notion that Heavy SNS users have higher possibilities of building and maintaining bonding and bridging SC online in rural communities and increase their social well-being, civic engagement and social inclusion than Light and Non- SNS users (Lampe et al., 2013). Our research findings suggest similar to previous studies that SNSs are more efficient and effective in building and maintaining bridging SC online than in building and maintaining bonding SC online in rural communities (Ellison et al., 2007; Lampe et al., 2013).

8   Conclusion

This research has made a number of important contributions to the theory and practice. Firstly, this research provided an important contribution to the theory of SC. SC online is still a contested theory due to the lack of adequate studies that have measured SC online conceptually and examined how SC can be built and maintained online using SNS. Furthermore, there is dearth of empirical studies which have examined relationship between SNS and bonding and bridging SC online in the context of rural communities. We used a previously validated instrument to confirm that the measurement of SC online can reliably and validly measured as a first order two factor hierarchical model consisting of bonding and bridging SC in the context of households in rural communities that have broadband connectivity. Our findings provide further support for previous empirical studies that measured SC online as two distinct factors: bonding SC and bridging SC (Ellison et al., 2007; Williams, 2006, 2007). This study also made

another important contribution to theory and existing knowledge by empirically investigating the use of SNSs as a facilitating mechanism for building and maintaining online SC for households in the context of rural communities. Our findings show that households in rural communities are similar to SNS users in urban communities in their choice of SNS with majority of households using Facebook and to a lesser extent other SNS such as Instagram, LinkedIn and Twitter (Blank & Lutz, 2017; Fayaz & Khalique, 2016; Pew Research 2017). Our findings provide support for previous studies that show higher SNS use is positively associated with higher online SC mean scores overall. Moreover, our findings support previous studies which found that SNS use is more effective in building and maintaining bridging SC online than bonding SC online (Ellison et al., 2007; Phua et al., 2017). As with all studies it is also important to acknowledge the limitations of this research. Further empirical studies over time and across a range of contexts are required to externally validate the measurement of SC online as a first order two factor hierarchical model of bonding SC and bridging SC. It is beyond the scope of this paper, but qualitative interviews of households could provide deeper insights into how and why SNS could be facilitating building and maintaining both bonding SC and bridging SC online in households in rural communities. The findings of this study regarding the positive role that SNS may be able to play in building and maintaining SC online in rural communities are promising. Hence, it is suggested government and social enterprises could make greater use of SNS to build and maintain SC and social cohesion online to enhance and complement SC and social cohesion that already exists offline in rural communities.

9   References

1   Ahn, J. (2012). Teenagers' experiences with social network sites: Relationships to bridging and bonding social capital. The Information Society, 28(2), 99-109.

2   Alam, K., & Imran, S. (2015). The digital divide and social inclusion among refugee migrants: A case in regional Australia. Information Technology & People, 28(2), 344-365.

3   Alston, M. (2002). Social capital in rural Australia. Rural Society, 12(2), 93-104.

4   AWD. (2017). Our region.   Retrieved 15 December 2015, from http://www.advancewesterndowns.com.au/our-region/

5   Bagozzi, R. P., & Yi, Y. (1991). Multitrait-multimethod matrices in consumer research. Journal of Consumer Research, 17(4), 426-439.

6   Batt, P. J. (2015). Australia's 'five strong pillar economy': agriculture.   Retrieved 10 October, 2016, from http://theconversation.com/australias-five-strong-pillar-economy-agriculture-40388

7   Best Start Resource Centre (2010). How to reach rural populations. Toronto, Ontario, Canada.

8   Blank, G., & Lutz, C. (2017). Representativeness of Social Media in Great Britain: Investigating Facebook, LinkedIn, Twitter, Pinterest, Google+, and Instagram. American Behavioral Scientist, 61(7), 741-756.

9   Bourdieu, P. (1985). The forms of capital. In J. Richardson (Ed.), Handbook of Theory and Research for the Sociology of Education (pp. 241-258). Westport, CT: Greenwood.

10   Boyd, D. M., & Ellison, N. B. (2008). Social network sites: Definition, history, and scholarship. Journal of Computer-Mediated Communication, 13(1), 210-230.

11   Brandtzaeg, P. B. (2012). Social networking sites: Their users and social implications—A longitudinal study. Journal of Computer-Mediated Communication, 17(4), 467-488.

12   Bronstein, J., & Aharony, N. (2015). Personal and political elements of the use of social networking sites. Information Research, 20(1), 54-67.

13   Burke, M., Kraut, R., & Marlow, C. (2011, 7-12 May 2011). Social capital on Facebook: Differentiating uses and users. Paper presented at the The SIGCHI Conference on Human Factors in Computing Systems, Vancouver, BC.

14 Cheers, B. (1998). Welfare bushed: social care in rural Australia. Alsershot, UK: Ashgate Publishing Limited.

15 Chowdhury, I. A., Haque, N., Kamal, M. M., Islam, M. N., Raihan, M. M. H., & Chowdhury, M. I. (2012). The relationship between years of schooling and the forms of social capital: A study conducted in an urban area, Under Sylhet City. Studies in Sociology of Science, 3(4), 22-31.

16 Coleman, J. S. (1988). Social capital in the creation of human capital. American Journal of Sociology, 94(1), 95-120.

17 Craighead, C. W., Ketchen, D. J., Dunn, K. S., & Hult, G. T. M. (2011). Addressing common method variance: guidelines for survey research on information technology, operations, and supply chain management. IEEE Transactions on Engineering Management, 58(3), 578-588.

18 Darcy, S., Maxwell, H., Edwards, M., Onyx, J., & Sherker, S. (2014). More than a sport and volunteer organisation: Investigating social capital development in a sporting organisation. Sport Management Review, 17(4), 395-406.

19 Donath, J., & Boyd, D. (2004). Public displays of connection. BT Technology Journal, 22(4), 71-82.

20 Dong, T., Liang, C., & He, X. (2017). Social media and internet public events. Telematics and Informatics, 34(3), 726-739.

21 Ellison, N., Steinfield, C., & Lampe, C. (2006). Spatially bounded online social networks and social capital. Paper presented at the Annual Conference of the International Communication Association, Dresden, Germany.

22 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, 12(4), 1143-1168.

23 Ellison, N., Vitak, J., Gray, R., & Lampe, C. (2014). Cultivating social resources on social network sites: Facebook relationship maintenance behaviors and their role in social capital processes. Journal of Computer Mediated Communication, 19(4), 855-870.

24 Explorable.com. (2009). Stratified Sampling Method. Retrieved 17 November, 2017, from https://explorable.com/stratified-sampling

25   Facebook. (2017). Stats.   Retrieved 10 October, 2017, from
      https://newsroom.fb.com/company-info/

26   Fayaz, H., & Khalique, A. (2016). A review on sociological impacts of social
      networking. International Journal of Engineering, Applied Sciences and Technology,
      1(12), 6-12.

27   Gefen, D., & Straub, D. (2005). A practical guide to factorial validity using PLS-Graph:
      Tutorial and annotated example. Communications of the Association for Information
      systems, 16(Article 5), 91-109.

28   Granovetter, M. (1973). The strength of weak ties. American Journal of Sociology, 78(6),
      1360-1380.

29   Gray, D., Shaw, J., & Farrington, J. (2006). Community transport, social capital and
      social exclusion in rural areas. Area, 38(1), 89-98.

30   Hair, J. F., Hult, G. T. M., Ringle, C., & Sarstedt, M. (2016). A Primer on Partial Least
      Squares Structural Equation Modeling (PLS-SEM). Thousand Oaks, CA, USA: Sage.

31   Hampton, K. N. (2011). Comparing bonding and bridging ties for democratic
      engagement: Everyday use of communication technologies within social networks for
      civic and civil behaviors. Information, Communication & Society, 14(4), 510-528.

32   Haythornthwaite, C. (2005). Social networks and Internet connectivity effects.
      Information, Community & Society, 8(2), 125-147.

33   Henseler, J., Ringle, C. M., & Sarstedt, M. (2015). A new criterion for assessing
      discriminant validity in variance-based structural equation modeling. Journal of the
      Academy of Marketing Science, 43(1), 115-135.

34   Hofer, M., & Aubert, V. (2013). Perceived bridging and bonding social capital on
      Twitter: Differentiating between followers and followees. Computers in Human
      Behavior, 29(6), 2134-2142.

35   Hofferth, S. L., & Iceland, J. (1998). Social capital in rural and urban communities. Rural
      Sociology, 63(4), 574-598.

36 Howard, A. (2012). Connecting with Communities: How Local Government Is Using Social Media to Engage with Citizens. ANZSOG Institute for Governance at the University of Canberra and Australian Centre of Excellence for Local Government. Retrieved from http://www.governanceinstitute.edu.au/magma/media/upload/ckeditor/files/1353548699_Connecting_Communities_ANZSIG-ACELG_August_2012.pdf

37 Instagram. (2017). Our Story.   Retrieved October, 2017, from https://instagram-press.com/our-story/

38 ITU. (2014). The rise of social networking - Changing the web as we know it.   Retrieved August, 2014, from http://www.itu.int/net/itunews/issues/2010/06/35.aspx

39 Johnstone, T. (2017). Bridging the digital divide between rural and regional.   Retrieved April, 2017, from https://http://www.ruralweekly.com.au/news/bridging-the-digital-divide-between-rural-and-regi/3152448/

40 Kaplan, A. M., & Haenlein, M. (2010). Users of the world, unite! The challenges and opportunities of social media. Business Horizons, 53(1), 59-68.

41 Lærd Dissertation (2012). Stratified random sampling. from http://dissertation.laerd.com/stratified-random-sampling.php

42 Laerd Statistics (2017). One-way ANOVA in SPSS Statistics.   Retrieved July, 2017, from https://statistics.laerd.com/spss-tutorials/one-way-anova-using-spss-statistics.php

43 Lamberton, C., & Stephen, A. T. (2016). A thematic exploration of digital, social media, and mobile marketing: research evolution from 2000 to 2015 and an agenda for future inquiry. Journal of Marketing, 80(6), 146-172.

44 Lampe, C., Vitak, J., & Ellison, N. (2013, 23-27 February 2013). Users and nonusers: Interactions between levels of adoption and social capital. Paper presented at the Computer Supported Cooperative Work, San Antonio, Texas, USA.

45 Lin, N. (1999). Building a network theory of social capital. Connections, 22(1), 28-51.

46 Lin, N. (2002). Social Capital: A Theory of Social Structure and Action (Vol. 19). New York, USA: Cambridge University Press.

47 LinkedIn. (2017). About us.   Retrieved October, 2017, from
    https://news.linkedin.com/about-us#statistics

48 Mossberger, K., Wu, Y., & Crawford, J. (2013). Connecting citizens and local
    governments? Social media and interactivity in major US cities. Government Information
    Quarterly, 30(4), 351-358.

49 Neves, B. B. (2013). Social capital and Internet use: the irrelevant, the bad, and the good.
    Sociology Compass, 7(8), 599-611.

50 Norris, P. (2004). The bridging and bonding role of online communities: Thousand Oaks,
    California: Sage Publications.

51 Onyx, J., & Bullen, P. (2000). Measuring social capital in five communities. The Journal
    of Applied Behavioral Science, 36(1), 23-42.

52 Park, S. (2017). Digital inequalities in rural Australia: A double jeopardy of remoteness
    and social exclusion. Journal of Rural Studies, 54, 399-407.

53 Pew Research (2017). Social media fact sheet.   Retrieved July, 2017, from
    http://www.pewinternet.org/fact-sheet/social-media/

54 Phua, J., Jin, S. V., & Kim, J. J. (2017). Uses and gratifications of social networking sites
    for bridging and bonding social capital: A comparison of Facebook, Twitter, Instagram,
    and Snapchat. Computers in Human Behavior, 72, 115-122.

55 Podsakoff, P. M., MacKenzie, S. B., Lee, J.-Y., & Podsakoff, N. P. (2003). Common
    method biases in behavioral research: a critical review of the literature and recommended
    remedies. Journal of Applied Psychology, 88(5), 879-903.

56 Putnam, R. D. (2001). Bowling Alone: The Collapse and Revival of American
    Community. New York, USA: Simon & Schuster.

57 Rebelo, M., & Alturas, B. (2011). Social networking as a marketing tool: study of
    participation in cultural events promoted by Facebook. Paper presented at the Academy
    of Marketing Annual Conference University in Liverpool, England.

58 Resnick, P. (2001). Beyond bowling together: Sociotechnical capital. In J. Carroll (Ed.),
    HCI in the New Millennium (pp. 247-272). Boston, MA: Addison-Wesley.

59   Roni, M. (2014). Introduction to SPSS. Joondalup WA, Australia: School of Business, Edith Cowan University.

60   Sandelowski, M. (2000). Combining qualitative and quantitative sampling, data collection, and analysis techniques in mixed-method studies. Research in nursing & health, 23(3), 246-255.

61   Steinfield, C., Ellison, N. B., & Lampe, C. (2008). Social capital, self-esteem, and use of online social network sites: A longitudinal analysis. Journal of Applied Developmental Psychology, 29(6), 434-445.

62   Straits, B. C. (2000). Ego's important discussants or significant people: An experiment in varying the wording of personal network name generators. Social Networks, 22(2), 123-140.

63   Straub, D., Boudreau, M.-C., & Gefen, D. (2004). Validation guidelines for IS positivist research. Communications of the Association for Information Systems, 13(24), 380-427.

64   Tenenhaus, M., Vinzi, V. E., Chatelin, Y.-M., & Lauro, C. (2005). PLS path modeling. Computational Statistics & Data Analysis, 48(1), 159-205.

65   Twitter. (2017). Twitter: number of monthly active users 2010-2017.   Retrieved November, 2017, from https://http://www.statista.com/statistics/282087/number-of-monthly-active-twitter-users/

66   Vieweg, S., Hughes, A. L., Starbird, K., & Palen, L. (2010). Microblogging during two natural hazards events: what twitter may contribute to situational awareness. Paper presented at the Proceedings of the SIGCHI conference on human factors in computing systems.

67   Wallace, C., Vincent, K., Luguzan, C., Townsend, L., & Beel, D. (2017). Information technology and social cohesion: A tale of two villages. Journal of Rural Studies, 54, 426-434.

68   Warburton, J., Cowan, S., & Bathgate, T. (2013). Building social capital among rural, older Australians through information and communication technologies: A review article. Australasian Journal on Ageing, 32(1), 8-14.

69   Warren, A. M., Sulaiman, A., & Jaafar, N. I. (2014). Social media effects on fostering online civic engagement and building citizen trust and trust in institutions. Government Information Quarterly, 31(2), 291-301.

70   Wellman, B., Haase, A. Q., Witte, J., & Hampton, K. (2001). Does the Internet increase, decrease, or supplement social capital? Social networks, participation, and community commitment. American Behavioral Scientist, 45(3), 436-455.

71   Wetzels, M., Odekerken-Schröder, G., & Van Oppen, C. (2009). Using PLS path modeling for assessing hierarchical construct models: guidelines and empirical illustration. MIS quarterly, 33(1), 177-195.

72   Wiesinger, G. (2007). The importance of social capital in rural development, networking and decision-making in rural areas. Journal of Alpine Research| Revue de géographie alpine, 95(4), 43-56.

73   Wikipedia. (2017). Western Downs Region.   Retrieved 15 December, 2015, from https://en.wikipedia.org/wiki/Western_Downs_Region

74   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.

75   Williams, D. (2007). The impact of time online: Social capital and cyberbalkanization. CyberPsychology & behavior, 10(3), 398-406.

76   Woodhouse, A. (2006). Social capital and economic development in regional Australia: A case study. Journal of Rural Studies, 22(1), 83-94.

77   Zhao, D., & Rosson, M. B. (2009). How and why people Twitter: the role that micro-blogging plays in informal communication at work. Paper presented at the Proceedings of the ACM 2009 International conference on Supporting group work, Sanibel Island, Florida.