Doctor of Nursing Practice Projects                                          Nursing

Spring 2019

# A Pre/Post Intervention Study to Assess Social Capital through Bonding and Bridging among Federal Nurse Teleworkers

Carrie Jeffries MPH, MS, RN, ANP-BC, AACRN, AAHIVS, NEA-BC, FACHE
*George Washington University*

Follow this and additional works at: https://hsrc.himmelfarb.gwu.edu/son_dnp

Part of the Nursing Commons

A Pre/Post Intervention Study to Assess Social Capital through Bonding and Bridging among

Federal Nurse Teleworkers


Presented to the Faculty of the School of Nursing

The George Washington University

In partial fulfillment of the

requirements for the degree of

Doctor of Nursing Practice


Carrie Jeffries, MPH, MS, RN, ANP-BC, AACRN, AAHIVS, NEA-BC, FACHE


DNP Project Team

Cathie E Guzzetta, PhD, RN, FAAN

Melanie Krause, PhD, RN

Qiuping (Pearl) Zhou, PhD, RN

**Abstract**

**Background:** The social capital components of bonding (within groups) and bridging (between external groups) are essential to building healthy and effective teleworking relationships that are required to retain staff.

**Objectives:** To identify if delivering a relationship building educational intervention to federal nurse teleworkers who used the internet daily would improve their total Internet Social Capital Scale (ISCS) scores and bonding and bridging subscale scores.

**Methods:** Our study employed a pre/post intervention design, aiming for a convenience sample of 75% (*n*=41/55) of federal nurse teleworkers. We delivered, via webinar, a 45-minute educational session on telework and techniques to increase bonding and bridging between the two surveys. The Likert scaled ISCS is a 20-item tool composed of the ten-item bonding subscale and ten-item bridging subscale. The respondents completed the pre- and post-ISCS surveys on their own time through PsychData.

**Results:** Forty-four subjects completed the ISCS pre-survey. We matched 28 pairs for those who completed the pre- and post-surveys and attended the intervention. After the intervention, the total mean ISCS score (*M*=3.44, *SD*=0.35; *p*=0.009) and bridging subscore (*M*=3.89, *SD*=0.50; *p*=0.02) were significantly higher than before the intervention (total *M*=3.26, *SD*=0.50; bridging *M*=3.43, *SD*=0.63). No significant differences were found between the pre- and post-survey bonding subscale scores.

**Conclusions:** An educational webinar significantly increased federal nurse teleworkers' perceptions of bonding and bridging on the total ISCS and bridging subscale. We recommend that teleworkers in other federal offices and the health insurance and pharmaceutical industries implement and evaluate a bonding and bridging education program.

**Background**

Telework is a robust recruitment and retention tool.  The United States (U.S.) Office of

Personnel Management (OPM) defines telework as "a work arrangement that allows an

employee to perform work, during any part of regular, paid hours, at an approved alternative

worksite" (United States Office of Personnel Management [OPM], n.d., para. 2).  At the end of

the fiscal year (FY) 2016, the OPM reported close to 470,000 federal teleworkers (OPM, 2017b,

para. 2).  Federal agencies that participated in the OPM's federal telework program during FY

2016 reported they had done so to increase:  employee attitudes, recruitment, retention, and

performance (OPM, 2017b, p. 16).  Additionally, agencies aimed to decrease commuter miles,

real estate holdings, and energy use (OPM, 2017b, p. 16).  Major, Verive, and Joice (2008)

revealed that teleworking increased the performance and retention of federal employees.

As opportunities to telework increase, organizations must be mindful of building and

maintaining social capital in a non-traditional office environment.  Experts define social capital

in numerous ways.  Commonly, it is described as "social ties, information, obligations,

expectations, and the social norms of a group of people that enable an individual to act"

(Gonzales & Nowell, 2017, p. 1102).  If there are weak social ties among teleworkers, there is

less likelihood that teams will effectively engage or share information (Baker, Moon, & Ward,

2006).

Two specific components of social capital are bonding, which occurs within groups, and

bridging, which happens between external groups.  Bonding is a relationship cultivated between

similarly-situated people, such as a project team or regional office (Kim, Subramanian, &

Kawachi, 2006, p. 116).  Bonding is a close relationship, attachment, or social connection to

others in one's immediate circle that is characterized by emotions like trust and affection, and

developed based upon things such as mutual interests. Bridging is a relationship developed between people who are at the same hierarchical level but may work in different departments or projects (Kim et al., 2006, p. 116). Bridging is a close relationship, attachment, or social connection to others characterized by emotions such as trust and affection among people outside of one's immediate circle. Carmeli, Ben-Hador, Waldman, and Rupp (2009); De Clercq, Bouckenooghe, Raja, and Matsyborska (2014); and Van Bogaert, van Heusden, Timmermans, and Frank (2014) discovered that bonding and bridging were positively associated with workplace engagement and employee retention.

## Problem Statement

Federal healthcare oversight organizations are continually trying to attract and retain well-qualified candidates, especially those trained as nurses. If federal agencies do not recruit, retain, and socially integrate excellent nurses, their ability to frame meaningful health care policy decisions and conduct effective oversight will be hampered. The social capital components of bonding and bridging, both relationship building concepts, are essential to building healthy, efficient, and effective teleworking relationships that are required to retain staff.

## Purpose

The purpose of our study was to identify if a bonding and bridging education intervention delivered to federal government nurse teleworkers, who use the internet daily, improved their Internet Social Capital Scale (ISCS) survey scores. A secondary purpose was to look for differences in the ISCS scores between telework type and length of time teleworked. The long-term purpose of the study was to better assist federal agencies in learning about and increasing the bonding and bridging among its nurse teleworkers to retain engaged nurse leaders.

## Aims

The specific aims of our study were to:

1. Develop the bonding and bridging educational seminar intervention for staff.

2. Administer the pre-ISCS survey to nurse teleworkers before implementing an educational seminar intervention for staff.

3. Administer the bonding and bridging educational intervention for staff synchronously and asynchronously via webinar.

4. Achieve at least a 75% ($n$=41) participation rate for both the pre- and post-ISCS surveys among federal nurse teleworkers across the U.S.

5. Administer the post-ISCS survey to nurse teleworkers after implementing an educational seminar intervention for staff.

6. Evaluate changes in the total mean ISCS scores before versus after the educational intervention.

7. Evaluate changes in the total mean ISCS pre- and post-survey change scores before versus after the educational intervention by telework type and length of time teleworked.

**Hypotheses**

For federal nurse teleworkers who attended a bonding and bridging educational intervention:

1. There is a difference in ISCS total mean scores and bonding and bridging subscores between the pre- and post- ISCS survey.

2. There is a difference in the pre-survey ISCS total mean scores between routine versus situational teleworkers.

3. There is a difference in the pre-survey ISCS total mean scores between those who have teleworked at the current organization for two years or more versus those who have teleworked for less than two years.

4.   There is a difference in total mean ISCS pre- and post-survey change scores between routine versus situational teleworkers.

5.   There is a difference in total mean ISCS pre- and post-survey change scores between those who have teleworked at the current organization for two years or more versus those who have teleworked for less than two years.

## Significance

In the U.S., there is a nursing shortage that has made it increasingly difficult for the federal government to hire competent nurses into administrative oversight roles.  The federal government aims to hire nurses to fulfill many of its occupational groups:  Nurse, Nurse Consultant, Supervisory Public Health Analyst, and Health System Specialist (OPM, 1977). Many federal agencies use telework as a recruitment and retention tool.  The Agency Employee Viewpoint Survey results released by the OPM did not measure nurse specific data on perceptions related to telework, bridging, or bonding (OPM, 2017b).

Our study assessed the bonding and bridging among federal nurse teleworkers to determine how the federal government may be able to engage better and retain quality nurses as they exercise the privilege of telework.  The information gleaned from our study will be shared with federal oversight agencies who aspire to keep qualified nurses.  Our study contributes to the field of nursing because there has been no data published on federal nurse teleworkers and their perceptions of bonding and bridging.  The educational webinar included concrete actions that federal nurse teleworkers could use to increase their relationships with teleworking teammates (Appendix).

## Literature Review

**History of Telework**

The term "telework" was coined in 1972 by Jack Niles, "The Father of Teleworking" (Dahlstrom, 2013). At the end of the 1970s, Frank Schiff published an article in The Washington Post titled "Working at Home Can Save Gasoline," and in 1980 the first conference around telework was organized by Gil Gordan (Liquid, Planner, 2013). AT&T held its first telecommuting day in 2014, two years after Yahoo canceled its teleworking privileges. The federal government began a National Telecommuting Initiative in 1996 (Liquid Planner, 2013). In 2001, Congress passed the Transportation and Related Agencies Appropriations Act of 2001 (Public Law 106-346), which required executive government agencies to establish a policy allowing workers to telework to the greatest extent possible without decreasing productivity (OPM, n.d.).

**Telework in the Federal Government**

With the Telework Enhancement Act of 2010, Congress mandated that federal departments share their progress in the execution of telework, which they had been implementing since 2001. At the end of FY 2016, 42% of all federal government employees were eligible to telework, and 51% of those eligible did so (OPM, 2017b, p. 5). Of those who telework, most exercised their right for situational versus routine telework (OPM, 2017b, p. 5). The average time teleworked per two-week pay period was 19 hours (OPM, 2018, p.17). Federal telework programs have demonstrated increased employee retention, performance, morale, health, and ability to manage stress (OPM, 2018, p. 18).

Although telework can be a robust recruitment and retention tool, fewer than 50% of federal agencies used it as such in FY 2016 (OPM, 2017b, p. 6). Departments cited barriers to telework implementation such as a lack of technology and managerial resistance. Federal managers are sometimes resistant to telework because they do not trust their employees to work

while teleworking (Brown, Smith, Arduengo, & Taylor, 2016). However, compared to the private sector, the federal government allows telework at a higher rate than private companies (Caillier, 2012). Federal healthcare telework rates are higher than those in the private healthcare sector (Brown, 2018, personal communication).

Both the federal government and the private sector have used telework as a reasonable accommodation for persons with disabilities for decades. That body of work provides articles on bonding and bridging among teleworkers, and often notes that teleworkers are at a social capital disadvantage when compared to on-site employees. Baker, Moon, and Ward (2006) discussed structural barriers to telework, including physical absence and ensuing social exclusion. Social exclusion and its association with decreased engagement experienced by teleworkers have consistently been documented in the literature (Baker, Moon, & Ward, 2006; Gajendran & Harrison, 2007). Dahlstrom (2013) stated that it takes an exceptional leader to ensure that teleworkers are not isolated.

**Social Capital**

Social capital is an investment in relationships concerning reciprocity and trust and increased well-being (Looman, 2004). Social capital is "the presence of a network that has an identifiable hub, and that operates toward common goals with ongoing consideration for the recipients" (Looman, 2004, p. 418). That network requires "multi-dimensional relationships that fosters reciprocal trust…" and an "…awareness of the needs of others with actions that effectively promote the ability of those needs to be met…" (Looman, 2004, p. 418). Aligning with the constructs of bonding and bridging, Looman (2004) opined that social capital is what "drive[s] individuals and groups to define common objectives that increase the group's wellbeing" (bonding) and "a distinct awareness of a bigger picture and an ability to draw on

certainty that goodness exists" (bridging) (p. 418).  Higher levels of social capital in the

workplace buffer against stress (Jay & Anderson, 2018, p. 4).

Fujita et al. (2016) sought to identify if social capital increased work engagement and

administered the Workplace Social Capital scale to 440 Japanese subjects across 35 hospitals.

The Workplace Social Capital Scale was valid and had reliability – the Cronbach alpha was 0.90

and intra-class correlation 0.60. (Fujita et al., 2016, p. 266).  Their results showed a statistically

significant ($p <.001$) and a positively associated increase in work engagement with higher levels

of social capital (Fujita et al., 2016, p. 267).  Subjects were 80.7% female, and most of the

healthcare respondents were nurses (Fujita et al., 2016, p. 267).

Social capital has been deconstructed into bonding relationships, bridging relationships,

and linking variables to allow for research measurement (Harpham, Grant, & Thomas, 2002).

Our study assesses two of three relationship social capital variables – bonding and bridging.

**Bonding and Bridging**

In their study of 76 work teams with 499 employees across 48 organizations, Henttonen,

Johanson, and Janhonen (2014) revealed a positive relationship between bonding, bridging,

performance effectiveness, and attitudinal outcomes (p. 346).  Their data came from the Finnish

Maintenance Work Ability barometer survey, which asked a few pointed questions related to

bonding and bridging within the overall survey.  The items had Cronbach alphas ranging from

0.69 to 0.82 (Henttonen, Johanson, & Janhonen, 2014).  They stressed that work teams need both

bonding and bridging networks to enhance performance effectiveness and that the developed

systems assist the team in defining its identity (Henttonen et al., 2014).  Oh, Chung, and

Labianca (2004) also asserted that teams need both bonding and bridging experiences, but one

should not be developed at the expense of the other, based on their research with 77 Korean

workgroups.  The authors used a self-developed intragroup networks and intergroup networks

tool, with values on a five-point Likert scale.  The authors presented no tool reliability and

validity statistics in their paper.  In a study of over 1,500 subjects, Reagans, Zuckerman, and

McEvily (2004) determined that bridging staff led to higher levels of productivity when

compared to bonded staff working together with their day to day colleagues in the office.  They

utilized available network data to run their analyses and did not use a specific measurement tool.

Further supporting the importance of bonding and bridging, Meng, Clausen, and Borg (2018)

conducted a study with over 700 dairy workers on 65 teams and found a statistically significant

difference in individual work engagement scores in those who felt bonded ($p<0.0001$) and

bridged ($p=0.0042$).  They utilized the Danish social capital questionnaire (Cronbach alpha 0.95)

and the Utrecht Work Engagement Scale 9 (Cronbach alpha 0.86) (Meng, Clausen, & Borg,

2018).

Researchers have studied bonding and bridging among healthcare workers in onsite

healthcare settings with encouraging results, possibly due to strong leadership presence co-

located with onsite staff.  Carmeli, Ben-Hador, Waldmann, and Rupp (2009) developed and

implemented their own, unnamed four-item bonding survey with 209 Israeli community center

participants in a cross-sectional study.  The authors did not include any reliability or validity

statistics on their tool.  Carmeli et al. (2009) reported a significant positive correlation ($p < .001$)

with increased work engagement and retention when subjects felt close to work colleagues, could

count on their colleagues, received help from them, and cared for them.  The study subjects felt

bonded to their peers.

Van Bogaert et al. (2014) studied 1,201 acute care registered nurses in Belgium to

determine if their perceptions of strong workplace social capital increased the quality of care

they delivered, workplace environment, and retention. Most of the subjects were full-time, bachelor prepared, female nurses. Van Bogaert et al. (2014) used the Belgian Revised Nursing Work Index, Utrecht Work Engagement Scale, and Intensity of Labor Scale, whose Cronbach alphas range from 0.65-0.90 (p. 4). There was a statistically significant positive association ($p<.001$) between strong workplace social capital and increased delivery of quality care and retention (Van Bogaert, Van Heusden, Timmermans, & Franck, 2014).

## Theoretical Foundation

Human capital "represents the investment people make in themselves that enhance their economic productivity" (Olaniyan & Okemakinde, 2008, p. 479). Our study employed the Human Capital Theory which asserts that with education and on the job training (like our webinar), individuals will increase their skill level, leading to increased retention and productivity (Becker, 1962; Schultz, 1961). Researchers believe that human capital is a "combination of ability, behavior, and efforts" and that it has three constructs: intellectual capital, social capital, and emotional capital (Davenport, 1999; Gratton & Ghoshal, 2003; Hayat, 2010). Intellectual capital is "the knowledge created as the result of interaction between people with each other as well as at the individual level that is left behind when people leave the organization" (Hayat, 2010, p. 7). In the context of human capital, social capital is the relationships that build, run, and regulate organizations which will define the organization's productivity (Hayat, 2010). The third construct, emotional capital, resides in humans as feelings such as love, hate, joy, and trust (Fineman, 2000; Hayat, 2010). Increasing intellectual capital, social capital, and emotional capital will increase human capital.

Federal nurses bring each of the human capital constructs to their organization. They come armed with a wealth of knowledge and understand the significance of relationships and

emotions.  However, the literature has shown that nurses experience intellectual growth during

on the job training, even if they must put important projects on hold to attend the training (Graf,

2006; Greve, Benassi, & Dag-Sti, 2010).  Nurses who communicate with, and train alongside

one another will, according to the Human Capital Theory, positively increase their work

relationships and be better able to read their colleagues emotions (Greve et al., 2010).  Culver-

Clark and Allison-Jones (2011), in their work with nurses, stated that investments made in

human capital resulted in "… increased performance, reduced turnover, and organizational

capacity…" – all of which are proposed long-term outcomes of our study (p. 18).  Figure 1

illustrates how the Human Capital Theory drove our research.

## Variable Definitions

The independent variables in the study included:  the 45-minute bonding and bridging

educational seminar.  The educational offering consisted of information on items known to

increase bonding and bridging in the workplace.  The dependent variables were the ISCS survey

scores, and the bonding and bridging subscale scores.  Demographic variables included gender,

generation, education status, telework type, and length of time teleworking (Table 1).

## Methods

**Research Design, Sample, and Sample Size**

Our study employed a prospective, single group, pre/post intervention design.  We aimed

for a convenience sample size of 75% ($n$=41 out of a possible 55) of the teleworking nurses in a

federal entity from August 28, 2018, through December 14, 2018.  We purposefully chose a

targeted sample of 41 that was higher than the power size estimate in case all the potential

subjects did not meet the inclusion criteria or did not complete both surveys.  The power size

estimate of a paired $n$=31 was calculated for a 0.05 two-tailed Type I error rate, a two-tailed

Type II error rate of 0.200, and with an effect size of 0.500 with one standard deviation of the change.  We chose to use a two-tailed test because we wanted to able to detect a change for both directions of the hypotheses.

Subjects were included in our study if they:  1) were a full-time, career or career-conditional agency employee; 2) were a registered nurse; 3) had a signed agreement with their supervisor for routine or situational telework; 4) had teleworked at least once in the past year  at the agency; 5) had access to a personal email account; 6) had access to the internet on their own time; 7) were willing and able to complete the pre/post-test on non-government time; and 8) attended the required intervention.  Potential subjects were excluded if they were not nurses.

**Recruitment**

Recruitment spanned six weeks from August 28, 2018, thru October 15, 2018.  The student researcher conducted recruitment via phone, email, and face to face conversation.  During the contacts, the student researcher explained the study purpose, that participation in the pre/post surveys was voluntary, and to be completed on personal time.  The student researcher offered a $5 electronic Starbucks gift card as an incentive for completion of each the pre-test and the post-test survey.

**Setting**

Data collection occurred across the nation via the PsychData web survey platform, which subjects accessed via the intranet.  The federally employed nurses all had signed telework agreements, used the internet daily, and worked across the U.S.

**Intervention**

The student researcher developed and delivered the 45-minute educational webinar available to all organization staff during a pre-scheduled meeting in Fall 2018.  The live

presentation was broadcast across the U.S. via Skype.  It covered definitions, the history of

telework, telework prevalence, and methods to increase social capital through bonding and

bridging. The presentation also included an interactive discussion, allowed for questions, and

provided a reference list (Appendix).  Best practices identified in the literature such as activities

geared toward building trust and professional relationships informed the presentation.  The

student researcher recorded the webinar for asynchronous electronic delivery, and the

presentation slides, reference list, and webinar link were sent via email to all staff within one

week of the presentation.  The student researcher delivered and recorded the seminar to ensure

the webinar was executed as planned and that all listeners received the same intervention.

**Instrumentation/Measurement**

We used two tools to collect the data in our study.  We developed our demographic tool

and deployed it during only the pre-survey through the PsychData platform.  We captured the

following demographics:  gender, generation, nurse educational status, telework status, and

length of time teleworking within the organization.  Gender was coded for male and female.

Generation was captured as Baby Boomer, 1946-1964 or Generation X, 1965-1981.  The

educational status of the nurse was defined by achievement of the highest degree earned in

nursing:  Associate Degree in Nursing, Bachelor of Science in Nursing, and Graduate degree in

nursing.  Telework type included routine (three or more days per two-week pay period) or

situational (two or fewer days per two-week pay period).  The last demographic variable was

time teleworked -- less than two years or greater than two years (Table 1).

Our second tool was the ISCS, which was administered via PsychData for both the pre-

and post-surveys.  The pre-survey was open for one month before the intervention.  One month

after the intervention, the post-survey was opened, and remained open for one month.

Online bonding and bridging were measured using the valid and reliable (Cronbach alpha=0.90) ISCS survey developed by Williams (2006). Williams (2006) initially administered the ISCS survey to 884 persons. Williams (2006) did not aim to develop two subscales within the ISCS. However, the use of an exploratory analysis yielded nine factors that were distinct to either bonding or bridging; hence, the two distinct subscales within the ISCS were identified. Williams (2006) explained that the "lack of negative interfactor loadings also confirmed, that while separate, the two overarching dimensions were obliquely related" identifying it appropriate to include both subscales in the one ISCS (p. 604). Confirmatory factor analysis and correlations for construct validity were run (Williams, 2006).

To our knowledge, the ISCS was the only reliable and valid tool in the literature which examined bonding and bridging in an online work environment. The ISCS consists of 20 questions, 10 on bonding and 10 on bridging. The tool takes less than 10 minutes to complete. The ISCS uses five Likert response categories including 1=strongly disagree, 2=disagree, 3=neutral, 4=agree, and 5=strongly agree. Two items on the bonding subscale were reverse coded. Total mean ISCS scores and bonding and bridging subscores range from 1-5. The tool assesses perception and does not define "good" or "bad" scores. However, the higher the scores, the stronger the perception of small group relationships (bonding) and across group relationships (bridging).

**Data Collection Procedure**

The student researcher emailed the PsychData internet study link to potential subjects. PsychData was the only data collector. Subjects clicked on the PsychData email link sent to them. After clicking on the link, the subjects automatically saw the Consent Statement. Subjects who agreed with the statement clicked "continue." The first question asked for a house or

apartment number to be entered on the pre-survey and remembered for the post-survey, which

allowed linking of the pre- and post-surveys.  Next, the subjects clicked on the "continue" button

to moved forward in the study.  When subjects reached the end of the survey, they clicked on the

"finish" button.  PsychData automatically saved the data.

Participants could request a $5 electronic Starbucks certificate each for completion of the

pre-survey and completion of the post-survey (up to $10 total).  The participants who wanted a

certificate sent an email to bondingandbridgingstudy@yahoo.com (listed in both the Consent

Statement and on the last page of the survey) requesting the electronic Starbucks certificate.  The

Starbuck's certificate was emailed directly by Starbucks to the email address identified in the

request.

**Data Analysis Plan**

PsychData produced an EXCEL data file for SPSS v25.0.  We checked the data from the

generated EXCEL spreadsheet to ensure it downloaded correctly from SPSS.  We removed

duplicate entries from the EXCEL spreadsheet and paired the pre- and posts surveys next to one

another.

We ran the Cronbach's alpha on responses from our ISCS pre-survey.  Descriptive

statistics were performed on each variable.  Frequencies and percentages were calculated for the

categorical variables of gender, age, registered nurse status, nursing education, telework status,

and length of telework.

A paired t-test was calculated to identify the differences in the total mean ISCS score, and

the bonding and bridging subscores between the pre-and post-ISCS survey (hypothesis 1).

Independent t-tests were calculated to determine differences in the total mean ISCS pre-survey

scores by routine versus situational teleworker (hypothesis 2) and by those who teleworked at the

organization for two years or more compared to less than years (hypothesis 3).  Total pre-post

ISCS change scores between routine versus situational teleworkers (hypothesis 4) and total pre-

post ISCS change scores between those who teleworked at the organization for two years or

more compared to less than two years (hypothesis 5) were calculated using an independent t-test.

All *p*-values were calculated with a significance level set at 0.05.

### Ethical Considerations

The study, including the pre-and post-surveys, was approved as an expedited review by

the George Washington University's Institutional Review Board.  Study participation was

voluntary.  The first page of the pre- and post-surveys contained a Consent Statement and

identified that clicking the "Continue" button indicated the subject's consent to taking part in the

study.  The online, anonymous survey did not request personally identifying information.

The PsychData web collection platform used encrypted 256-bit Secure Socket Layer

Technology for transmission over the internet.  Data were stored on a PsychData server and held

in an isolated database only accessed with the correct username and password.  We had full

control over the data, and it was backed up each time it was saved.  The raw data were saved to

an external hard drive.  Throughout, and at the end of, the study the student investigator stored

data on an external hard drive, which we held in a fire-proof locked box.  Data will be kept for

three years as required.  We permanently deleted the data from PsychData at the end of the

study.

We kept the external hard drive under a double lock when not being used.  We were the

only ones who used the external hard drive.  Nurses anonymously participated in our surveys

and, therefore, we did not have any means to determine which individual responded with which

answers.  The only possible way that we may have had an idea who took the surveys was based

on the email addresses used to request electronic Starbucks certificates. If the email addresses

did not have names in them, we did not know who asked for an electronic Starbucks certificate.

Requesting an electronic Starbucks certificate was not linked to completing the survey so anyone

contacted could request a certificate whether they participated or not. Furthermore, the email

account set up for the study was only accessed for study purposes and deleted upon study

completion.

<div align="center">

**Results**

</div>

**ISCS Reliability**

The ISCS and subscales demonstrated good reliability in our study. The pre-survey ISCS

Cronbach's alpha, taken by 44 participants, was 0.81, bonding 0.57, and bridging 0.89.

**Demographic Characteristic of the Respondents**

We received eighty total responses from both the pre- and post-surveys. Both surveys had

double the average internal survey response rate with 44 of 55 (80%) completing the pre-survey and

36 of 44 (82%) completing the post-survey (Gorsht, 2013). Nurses taking the post-survey

acknowledged listening to the educational webinar. The educational session was open to all

members of the office including non-nurses, and 103 attended. Seventy-eight attended the live

presentation, and 25 listened to the recording. Pre- and post- ISCS surveys were linked, however, to

only 28 pairs.

Of the 44 pre-survey respondents, all were nurses ($n=44$). Most were female ($n=40$,

90.1%), Baby Boomers ($n=26$, 59.1%), earned a graduate degree in nursing ($n=24$, 54.5%), utilized

routine telework ($n=34$, 79.1%) and had teleworked at the organization for less than two years

($n=24$, 54.5%; Table 2). The 28 paired study participants were representative of the population

studied. All were nurses ($n=28$, 100%), most were female ($n=24$, 85.7%), earned a graduate degree

in nursing (*n=17*, 60.7%), utilized routine telework (*n=24*, 85.7%), and had teleworked at the

agency for less than two years (*n=24*, 85.7%; Table 2). Half were Baby Boomers (*n=14*, 50.0%).

**Study Results**

        We checked the distribution of the variables. All variables appeared normally distributed as

the skewness to standard error and kurtosis to standard error ratios were less than 2.0. The normality

assumptions were not violated. We first evaluated hypothesis 1 for the difference in the ISCS total

mean scores and the bonding and bridging subscale scores before and after the intervention using

paired t-tests.  The ISCS total mean score for the pre-survey was 3.26 (*SD*=0.50), which

indicated the nurses were neutral about their feelings of bonding and bridging in the workplace.

The total mean post-survey ISCS was 3.44 (*SD*=0.35), which indicated a higher level of bonding

and bridging one month after the intervention.  The difference in total mean ISCS scores between

the pre- and post-surveys was statistically significant  (*t*=2.83, *p*=.009; Table 3), which indicated

that nurses perceived significantly higher levels of bonding and bridging after the intervention

than before.

        The bonding subscale mean scores for the pre-survey was 3.08 (*SD*=0.68) and 3.24

(*SD*=0.61) for the post-survey.  The difference in the bonding subscore between the pre- and

post-surveys was not significant.  However, the bridging subscale mean score for the pre-survey

was 3.43 (*SD*=0.63) and 3.83 (*SD*=0.50) for the post.  The difference in the bridging subscale

mean score between the pre- and post-surveys was significantly different (*t-test=2.55; p=0.02),*

which indicated that nurses perceived significantly higher levels of bridging after the

intervention compared to before the intervention (Table 3).

        Next, we evaluated hypotheses 2 and 3 with the pre-survey sample (*n=44*) to assess if

there were differences in the total mean ISCS pre-survey scores between types of telework and

length of telework. The ISCS pre-survey means for routine versus situational teleworkers were 3.29 (*SD*=0.58) and 3.39 (*SD*=0.52) respectively. The ISCS pre-survey mean for those who teleworked less than two years at the organization was 3.32 (*SD*=0.62) versus the pre-survey mean of 3.35 (*SD*=0.52) for those who teleworked for two years or more. There were no significant differences in the mean scores by type or length of telework.

Lastly, we evaluated hypotheses 4 and 5 for the 28-paired surveys to determine if there were differences in total mean ISCS pre- and post-survey change scores between those who were routine versus situational teleworkers and those who had teleworked at the current organization for two years or more versus those who had teleworked for less than two years. Routine teleworkers had a mean pre- and post-ISCS change score of 0.29 (*SD*=0.52). Situational teleworkers had a mean pre- and post-ISCS change score of 0.21 (*SD*=0.63). The mean pre-post ISCS change score for those who teleworked less than two years at the organization was 0.26 (*SD*=0.59). The same score for those who teleworked two years or more at the organization was 0.31 (*SD*=0.44). There were no significant differences in the mean pre-post-survey change scores by type or length of telework.

## Discussion

The reliability of the total ISCS score and the bonding and bridging subscales scores in our study demonstrated high internal consistency of the items and was similar to the findings of others. Using the scale in 765 subjects, Williams (2006) reported high reliability (bondin*g a*=0.896, bridging *a*=0.841) (p. 621). Stefanone, Kwan, and Lackaff (2012) used the ISCS to identify bonding and bridging among 49 Facebook users, and the Cronbach's alpha for bonding was 0.88 and 0.85 for bridging (p. 457). Guo, Li, and Ito (2014) determined the ISCS reliable

for both bridging (*a*=0.85*),* and bonding (*a*=0.63*)* among social networking sites participants in

Japan (p. 56).

To our knowledge, our study is the first to assess the effects of a bonding and bridging

intervention among federal nurse teleworkers.  We found a significant increase in nurse

perceptions on the total ISCS and bridging subscale scores among a small sample (hypothesis 1).

The webinar the student researcher developed and delivered enabled nurses to increase their

perceptions about the relationships they developed among their small teams (bonding) and across

the organization (bridging).  We speculate that the tools and information provided during the

educational intervention, coupled with a new awareness about the positive impact of online

relationship building, were associated with the increased perceptions of bonding and bridging.

Our intervention stressed the importance of team building, clear online communication,

working toward a common goal, and recognition (Appendix).  Henttonen et al. (2014) wrote that

managers need to focus on team building and social networks when looking to optimize

performance through bonding and bridging.  There should be a clear articulation of how team

members contribute work toward achieving the mission and vision of the organization through

constant, clear communication (Lembke and Wilson, 1998).  Brown et al. (2016) and Henttonen

et al. (2014) argued that explicit and repeated clarification of team boundaries and roles are

integral to increasing social capital.

Tyler and Blader (2003) realized that groups must be engaged in multiple levels of

decision-making to increase their organizational commitment and sense of identity – teams want

to feel that they are involved in decisions.  Authors have observed that bonding and bridging are

improved when using award recognition for behavior alignment of team members (Lembke &

Wilson, 1998).  The educational intervention offered several ways to reward staff in the

teleworking environment such as the use of online thank you cards, official award nominations, and the use of electronic gift cards. Additionally, the intervention discussed concrete activities that focused on the importance of social events such as social gatherings, everyday intergroup activities to increase bridging and break down silos, and the use of social media as concrete strategies that foster bonding and bridging (Appendix) (Henttonen et al., 2014).

The significant increase in the bridging subscale mean scores between the pre- and post-survey was not unexpected. Grottke, Hacker, and Durst (2018), in their study of 888 subjects using the ISCS found that bridging tended to be higher in older participants – 50% of our paired sample was composed of Baby Boomers. Sharma, Menon, and Marimuthu (2017) utilized the ISCS to assess the difference in bridging and bonding among 93 subjects who had high internet use, as our teleworkers did. Those with high online usage had increased bridging with others, but no change in their development of close relationships, or bonding, as our results indicated (Sharma, Menon, & Marimuthu, 2017).

Wong, Ching, Whitfield, and Duncan (2016) used the ISCS to determine the bonding and bridging levels of deaf students in Australia who used social media and the internet. A total of 29 students completed the ISCS questionnaire (bonding $a=0.92$; bridging $a=0.88$) (Wong et al., 2016, p. 109). Over 59% of the students spent five hours a day, or more, on the internet interacting with peers (Wong et al., 2016, p. 107). Students who spent more than four hours a day on the internet had higher levels of online bridging when compared to those who spent less time; however, there was no statistically significant difference seen in bonding between the two groups (Wong et al., 2016, p. 110). Our participants generally spent 40 hours a week using the internet.

The absence of a significant difference in the pre-post bonding subscale scores may have been related to the fact that half of the paired subjects in our study were Baby Boomers and that older internet users were found to have less favorable online bonding experiences (Burke, Marlow, & Lento, 2010). However, in our study, most respondents were females, who tend to bond more than men (Burke et al., 2010). Grottke et al. (2018) found that if the internet is used to connect new people, bonding tends to be lower (p. 6). The respondents used the internet daily to connect with other staff, which may help explain why we did not find a difference in the bonding subscale scores.

We found no significant differences in the total mean ISCS pre-survey scores or total mean ISCS pre- and post-survey change scores between telework type or length. Perhaps we did not find a statistically significant difference in any of the groups because most participants routinely teleworked at the organization for less than two years. One possible reason for no difference in the total mean ISCS pre-survey scores or total mean ISCS pre- and post-survey change scores between telework type or length is that the nurses may have all received the same guidance on telework expectation when starting in their current roles.

### Study Limitations

We identified four limitations to our study. One, we conducted our study within one federal government office among nurses who self-selected to answer the surveys which may have led to selection bias. The nurses in our study were office workers. Our findings are not generalizable to nurses who are actively providing clinical care.

Two, we believe there are a couple of reasons we did not reach our goal of 31 paired samples for our pre/post study. Falling short of our goal increased the risk of a false negative result. We used the rigorous two-tailed test which means our results were less likely to show

statistical significance then if we had used a one-tailed test.  We wanted to determine if there was

a difference in either direction at the expense of having a higher statistical power.

Third, the pre- and post- intervention study design required participants to remain

engaged at three different points in time.  Fourth, the participants also had to remember their

linking code.  We had 44 participants in the pre-survey and 36 participants in the post-survey.

We were only able to match 28 pairs.  We believe that several respondents forgot the linking

identification number (house or apartment number) they used on the pre-survey.  This could have

occurred because respondents made up a number and did not save it in a place they could easily

remember or retrieve.

### Implications/Recommendations for Policy, Practice, and Research

Our study findings demonstrated that an educational intervention was effective to

improve nurses' perceptions of bonding and bridging in the telework arena.  The intervention

could also be used by other federal offices, the health insurance and pharmaceutical industries,

and nursing institutions of higher learning.  We recommend that organizations increase and

sustain bonding and bridging through policy change, practice, education, and research.  The

increased perceptions of closer relationships may lead to a happier team and decreased turnover.

Through the broad dissemination of our research, we could impact health policy.  The

student investigator will disseminate our results to members of the federal Senior Executive

Services within two executive departments that oversee national health care policy.  The student

investigator will also present our data at a national conference targeting executive healthcare

leaders who set healthcare systems strategies.  Lastly, the student investigator will disseminate

our results at an international nursing conference targeting key nursing leaders and providing

information that will better allow them to impact national and local policy.  A change to an

organization's local policy may mean that all teleworking nurses are required to participate in a bonding and bridging educational session.

Our data have implications for future research.  We recommend the study be replicated with a larger sample size.  Researchers might also want to measure the long-term effects of the intervention to assess if there is a sustained change in bonding and bridging perceptions over six months or a year.  We also recommend that the same research be conducted with nurses who telework 100% of the time in the healthcare insurance and pharmaceutical industries and then evaluate whether there is an increase in nurse retention and productivity related to increases in bonding and bridging.

An educational session has the power to impact practice change.  Leaders who are interested in increasing nurse's perceptions on the strength of their work relationships should develop an education program, with actionable, concrete strategies to build teleworking relationships.

**Sustainability**

Practice change and sustainability do not happen overnight.  We recommend the development, implementation, and evaluation of a practice change program that could increase the perception of bonding and bridging in organizations.  The program would be named according to the needs of the organization.

The newly developed program would require the support of leadership and the buy-in of early nurse adopters.  We envision an ongoing two-year program with several facets tailored to the teleworking environment, which includes the delivery of evidence-based relationship building workshops, utilization of concrete remote team building activities and discussions, and individual and team recognition.  Specifically, the implemented workshops could include

educational presentations and interactive case study discussions targeted toward the adult learner focusing on maintaining a positive work environment, providing interactive tools, and encouraging self-reflection (Grottke, Hacker, & Durst. 2018).

The team building activities could vary depending on the group personality but could include taking and discussing assessment tool results; developing a common mission, vision, and set of specific team values; conducting team meetings via video at least monthly; and holding weekly video and chat team lunches. Staff recognition for accomplishments and important events could be individual and provided through a short, thoughtful email; a mailed card; an occasional gift card; a certificate; or verbalization of the good old-fashioned "thank you." Teams could be recognized in public through verbal recognition; team t-shirts and mugs; monetary awards; and time off.

We believe the two-year program should be continually evaluated to identify its successes and opportunities. Two months after each educational seminar, the ICSC survey should be sent to all participating staff to see if there is a change in bonding and bridging perceptions over time. The program should be continually evaluated and improved to ensure the content and delivery are well received by the intended audience. Adjustments should be made to the seminars throughout the process and used to deploy an improved version of the program in subsequent cycles.

## Conclusions

An educational webinar provided to federal nurse teleworkers working at a desk job significantly increased their perceptions of bonding and bridging relationships measured by the total ISCS and bridging subscale. No statistically significant differences in ISCS scores were identified between routine or situational teleworkers or those who had teleworked at the

organization for less than two years, or two years and longer.  We recommend that our research

be replicated with nurses who telework 100% of the time and be taken a step further to evaluate

whether there is an increase in nurse retention and productivity related to increases in bonding

and bridging.  Lastly, we recommend that other federal offices, the health insurance, and

pharmaceutical industries, and nursing institutions of higher learning develop, implement, and

evaluate an educational bonding and bridging practice change program.

References

Baker, P. M., Moon, N. W., & Ward, A. C. (2006). Virtual exclusion and telework:  Barriers and

opportunities of technocentric workplace accommodation policy. *Work*, *27*, 421-430.

Becker, G. S. (1962). Investment on human capital: A theoretical analysis. *Journal of Political

Economy*, *70*(5), 9-49. Retrieved from

http://www.jstor.org/stable/1829103?seq=1#page_scan_tab_contents

Brown, C., Smith, P., Arduengo, N., & Taylor, M. (2016). Trusting telework in the federal

government. *The Qualitative Report*, *21*(1), 87-101. Retrieved from

http://nsuworks.nova.edu/tqr/

Burke, M., Marlow, C., & Lento, T. (2010). Social network activity and social well-being. In

*Proceedings of the 28th International Conference on Human Factors in Computing

Systems – CHI'10,* p. 1909-1912.

Caillier, J. G. (2012). The impact of teleworking on motivation in a U.S. federal government

agency. *American Review of Public Administration*, *42*, 461-480.

https://doi.org/10.1177/0275074011409394

Carmeli, A., Ben-Hador, B., Waldman, D. A., & Rupp, D. E. (2009). How leaders cultivate

social capital and nurture employee vigor: Implications for job performance. *Journal of

Applied Psychology*, *94*, 1553-1561. https://doi.org/10.1037/a0016429

Culver-Clark, R., & Allison-Jones, L. (2011, January 1). Investing in human capital: An

academic-service partnership to address the nursing shortage. *Nursing Education

Perspectives*, *32*(1), 18-21. Retrieved from

http://eds.b.ebscohost.com.proxygw.wrlc.org/ehost/pdfviewer/pdfviewer?vid=9&sid=861

75bec-7d69-49bd-b7e1-568d9e652048%40sessionmgr104

Dahlstrom, T. R. (2013). Telecommuting and leadership style. *Public Personnel Management*,

    *42*, 438-451. https://doi.org/10.1177/0091026013495731

Davenport, T.O. (1999). *Human Capital: What it is and why people invest it*. San Francisco:

    Jossey-Bass.

Falk, J. (2012). Comparing benefits and total compensation in the Federal government and

    private sector. *Working Paper Series: Congressional Budget Office*. Washington, DC.

    Retrieved from https://www.cbo.gov/sites/default/files/cbofiles/attachments/2012-

    04FedBenefitsWP_0.pdf

Fineman, S. (2000). *Emotion in Organization.* London: Sage.

Fujita, S., Kawakami, N., Ando, E., Inoue, A., Tsuno, K., Kurioka, S., & Kawachi, I. (2016). The

    association of workplace capital with work engagement of employees in health care

    settings. *American College of Environmental and Occupational Medicine*, *58*, 266-271.

    https://doi.org/10.1097/JOM.0000000000000605

Gajendran, R. S., & Harrison, D. A. (2007). The good, the bad, and the unknown about

    telecommuting: Meta-analysis of psychological mediators and individual consequences.

    *Journal of Applied Psychology*, *92*, 1524-1541. https://doi.org/10.1037/0021-

    9010.92.6.1524

Gonzales, E., & Nowell, W. B. (2017). Social capital and unretirement: Exploring the bonding,

    bridging, and linking aspects of social relationships. *Research on Aging*, *39*, 1100-1117.

    https://doi.org/10.1177/0164027516664569

Gorsht, R. (2013). How the best leaders get full participation in employee surveys. *Forbes.*

    Retrieved from https://www.forbes.com/sites/sap/2013/10/23/lousy-response-rates-on-

    your-employee-survey-heres-how-the-best-leaders-get-great-participation-every-time/

Graf, C. M. (2006). ADN to BSN: Lessons from Human Capital Theory. *Nursing Economics*, *24*(3), 135-142.

Greve, A., Benassi, M., & Dag-Sti, A. (2010). Exploring the contributions of human and social capital to productivity. *International Review of Sociology*, *20*(1), 35-38. https://doi.org/10.1080/03906701003643261

Grottke, M., Hacker, J., & Durst, C. (2018). Which factors determine our online social capital? An analysis based on structural equation modeling. *Australasian Journal of Information Systems*, *22*, 1-36.

Guo, Y., Li, Y., & Ito, N. (2014). Exploring the predicted effect of social network site use on perceived social capital and psychological well-being of Chinese international student in Japan. *Cyberpsychology, Behavior, and Social Networking*, *17*, 52-58. https://doi.org/10.1089/cyber.2012.0537

Harpham, T., Grant, E., & Thomas, E. (2002). Measuring social capital within health surveys: key issues. *Health Policy and Planning*, *17*, 106-111. https://doi.org/10.1093/heapol/17.1.106

Hayat, Naeem. (August 27, 2010). Evaluation of Human Capital, 1-36. Available at http://dx.doi.org/10.2139/ssrn.1667294

Henttonen, K., Johanson, J., & Janhonen, M. (2014). Work-team bonding and bridging social networks, team identity and performance effectiveness. *Personnel Review*, *43*, 330-349. https://doi.org/10.1108/PR-12-2011-0187

Jay, K., & Anderson, L.L. (2018). Can high social capital at the workplace buffer against stress and musculoskeletal pain? Cross-sectional study. *Medicine, 97*(12), 1-6.

Kim, D., Subramanian, S. V., & Kawachi, I. (2006). Bonding versus bridging social capital and

their associations with self rated health: A multilevel analysis of 40 US communities.

*Journal of Epidemiology and Community Health*, *60*, 116-122.

https://doi.org/10.1136/jech.2005.038281

Lembke, S., & Wilson, M. G. (1998). Putting "Team" into teamwork: Alternative theoretical

contributions for management practice. *Human Relations*, *51*, 917-945.

Liquid Planner (2013, August 6). Infographic: The history of telecommuting [Blog post].

Retrieved from https://www.liquidplanner.com/blog/infographic-the-history-of-

telecommuting/

Looman, W. S. (2004). Defining social capital for nursing: Experiences of family caregivers of

children with chronic conditions. *Journal of Family Nursing*, *10*, 412-428.

https://doi.org/10.1177/1074840704269846

Gratton, L. & Ghosal, S. (2003).  Managing personal human capital: New ethos for volunteer

employees. *European Management Journal, 21*, 1-10.

Major, D. A., Verive, J. M., & Joice, W. (2008). Telework as a dependent care solution:

Examining current practice to improve telework management strategies. *The

Psychologist-Manager Journal*, *11*, 65-91. https:// doi.org/10.1080/10887150801967134

Meng, A., Clausen, T., & Borg, V. (2018).  The association between team-level social capital

and individual-level work engagement: Differences between subtypes of social capital

and the impact of intra-team agreement. *Scandinavian Journal of Psychology*, 59, 198-

205.  https://doi.org/10.0000/sjop.12345

Merriam-Webster. (n.d.). *Definition of gender*. Retrieved from https://www.merriam-

webster.com/dictionary/gender

Nisen, M. (2013, May 25). How to know if you're too old to call yourself a millennial. *Business Insider*. Retrieved from http://www.businessinsider.com/definition-of-generational-cohorts-2013-5

Oh, H., Chung, M., & Labianca, G. (2004). Group social capital and group effectiveness: The role of informal socializing ties. *The Academy of Management Journal*, *47*, 860-875. Retrieved from http://www.jstor.org/stable/20159627

Olaniyan, D.A., & Okemakinde, T. (2008). Human Capital Theory: Implications for educational development, *Pakistan Journal of Social Sciences, 5*, 479-483.

PsychData. (n.d.). Retrieved from https://www.psychdata.com

Reagans, R., Zuckerman, E., & McEvily, B. (2004). How to make the team: Social networks vs. demography as criteria for designing effective teams. *Administrative Science Quarterly*, *49*, 101-133. Retrieved from http://www.jstor.org/stable/413145.

Schultz, T. W. (1961). Investment in human capital. *The American Economic Review*, *51*(1), 1-17. Retrieved from http://www.jstor.org.proxygw.wrlc.org/stable/pdf/1818907.pdf?refreqid=excelsior%3Abd6abac6da69de00937f260bf1bec333

Sharma, M. J., Menon, I. S., & Marimuthu, P. (2017). An exploration of the use of social networking sites amongst users with psychological problems. *ASEAN Journal of Psychiatry*, *18*. Retrieved from www.aseanjournal.org

Stefanone, M. A., Kwon, K. H., & Lackaff, D. (2012). Exploring the relationship between perceptions of social capital and enacted support online. *Journal of Computer-Mediated Communication*, *17*, 451-466. https://doi.org/10.1111/j.1083-6101.2012.01585.x

Tyler, T. R., & Blader, S. L. (2003). The group engagement model: Procedural justice, social

identity, and cooperative behavior. *Personality and Social Psychology Review*, *7*, 349-

361.

United States Office of Personnel Management. (1977). Position classification standard for

nurses. Retrieved from https://www.opm.gov/policy-data-oversight/classification-

qualifications/classifying-general-schedule-positions/standards/0600/gs0610.pdf

United States Office of Personnel Management. (2017a). *2017 Federal employee viewpoint*

*survey: Governmentwide management report*. Retrieved from

https://www.opm.gov/fevs/reports/governmentwide-reports/governmentwide-

management-report/governmentwide-report/2017/2017-governmentwide-management-

report.pdf

United States Office of Personnel Management. (2017b). *Status of telework in the Federal*

*government: Report to Congress, Fiscal Year 2016*. Retrieved from

https://www.telework.gov/reports-studies/reports-to-congress/2016-report-to-

congress.pdf

United States Office of Personnel Management. (2018). *Federal work-life survey:*

*Governmentwide report.* Retrieved from https://chcoc.gov/sites/default/files/2018-

federal-work-life-survey-report.pdf

United States Office of Personnel Management. (n.d.). *What is telework?* [Web page]. Retrieved

from https://www.opm.gov/FAQs/QA.aspx?fid=b48bf83b-440c-4f1e-a88c-

3cdc9d802ac8&pid=75346675-3b92-4aec-831d-58cf5b0e86d2

Van Bogaert, P., Van Heusden, D., Timmermans, O., & Franck, E. (2014). Nurse engagement

impacts job outcome and nurse-assessed quality of care: Model testing with nurse

practice environment and nurse work characteristics as predictors. *Frontiers in Psychology*, *5*(1261), 1-11. https://doi.org/10.3389/fpsyg.2014.01261

Williams, D. (2006). On and off the 'Net: Scales for social capital in an online era. *Journal of Computer-Mediated Communication*, *11*, 593-628. https://doi.org/10.1111/j.1083-6101.2006.00029.x

Wong, C. L., Ching, T. Y., Whitfield, J., & Duncan, J. (2016). Online social participation, social capital and literacy of adolescents with hearing loss: A pilot study. *Deafness & Education International*, *18*(2), 103-116. https://doi.org/10.1080/14643154.2016.1159783

*Table 1*

*Definition of Variables*

| Variable | Theoretical | Operational | Measurement |
|---|---|---|---|
| **Independent** | | | |
| Educational seminar | A learning opportunity for teleworking nurses to learn about bridging and bonding best practices. | 45-minute live, synchronous, and asynchronous training. | Participants taking the post-survey will affirm they attended the educational seminar. |
| **Dependent** | | | |
| Pre and post ISCS mean scores | Difference between the mean of ISCS pre-test and post-test scores. | The minimum score is 20 and the maximum is 100. (Williams, 2006). | Scale 1=Strongly disagree 2=Disagree 3=Neutral 4=Agree 5=Strongly Agree |
| ISCS total mean score | Mean scores calculated from the 20-item ISCS. | Mean scores generated by the sum of each subject after completion of the total ISCS score which includes both | Scale 1=Strongly disagree 2=Disagree 3=Neutral 4=Agree 5=Strongly Agree |

| | | bridging and bonding. The minimum score is 20 and the maximum is 100 (Williams, 2006). | |
|---|---|---|---|
| Bonding subscale mean scores | Individual question mean scores calculated from the 10-item ISCS bonding subscale. | Bonding subscale scores generated by each subject after completion of the bonding sub-scale.  The ten items include: problem solving, advice, personal problems, loneliness, emergency loan, reputation, sharing, importance, and injustice. | Scale 1=Strongly disagree 2=Disagree 3=Neutral 4=Agree 5=Strongly Agree |
| Bridging subscale mean scores | Individual question mean scores calculated from the 10-item | Bridging subscale scores generated by each subject after completion of the | Scale 1=Strongly disagree 2=Disagree |

| | | | 3=Neutral |
|---|---|---|---|
| | ISCS bridging subscale. | bridging subscale. The ten items include interested in things, new things, thinking, curiosity, big picture, bigger picture, world connection, community, talk, and contact. | 4=Agree 5=Strongly Agree |
| **Demographic Variables** | | | |
| Gender | "The behavioral, cultural, or psychological traits associated with one sex" (Merriam-Webster, n.d.) | Male or female (Transgender not included due to small sample) | Nominal 1=Male 2=Female |
| Age | Biologic age of life according to generations as written by Nisen, (2013). | Breakdown of age by generation and year: baby boomer and generation X (Nisen, 2013) | Nominal 1=Baby Boomer, 1946-1964 2=Generation X, 1965-1981 |
| Nurse Education | The degree level a nurse has achieved. | An Associate Degree in Nursing is a two year | Nominal 1=Associate Degree |

| | | nursing degree based upon a registered nursing curriculum.  A Bachelor of Science in Nursing degree is a four Year degree in nursing. A graduate degree in nursing is a Master or Doctorate degree focused on the discipline of nursing. | in Nursing<br><br> 2=Bachelor of Science in Nursing (BSN)<br><br>3=Graduate degree in nursing |
|---|---|---|---|
| Telework type | "A work arrangement that allows an employee to perform work, during any part of regular, paid hours, at an approved alternative worksite" (OPM, n.d., para. 2). | "Routine telework is three or more days per two-week pay period…situational use of telework is two or less days per pay period" (OPM, 2017a, p. 5). | Nominal<br><br>1=Routine<br><br>2=Situational |

| Length of telework experience | Length of time a nurse has been teleworking at the agency. | Two years or more equals 730 calendar days or more. Two years or less in 729 calendar days or below. | Nominal<br><br>1=Fewer than two years<br>2=Two years or greater |
| --- | --- | --- | --- |

*Table 2*

*Demographic characteristics of the sample*

| | Pre-Survey Respondents | Paired Pre-Post Survey Respondents |
|---|---|---|
| Variable | *n* (%) | *n* (%) |
| | 44 (100) | 28 (100) |
| Gender | | |
| Male | 4 (9.1) | 4 (14.3) |
| Female | 40 (90.1) | 24 (85.7) |
| Age | | |
| Baby Boomer | 26 (59.1) | 14 (50.0) |
| Generation X | 18 (40.9) | 14 (50.0) |
| Nursing Education | | |
| ADN | 0 (0) | 0 (0) |
| BSN | 20 (45.5) | 11 (39.3) |
| Graduate Degree | 24 (54.5) | 17 (60.7) |
| Telework Type | | |
| Routine | 34 (79.1) | 24 (85.7) |
| Situational | 9 (20.9) | 4 (14.3) |
| Time Teleworking | | |
| Two years or less | 24 (54.5) | 24 (85.7) |
| Greater than two years | 20 (45.5) | 4 (14.3) |

*Table 3*

*Differences in total mean ISCS scores and bonding and bridging subscores before and after the education session*

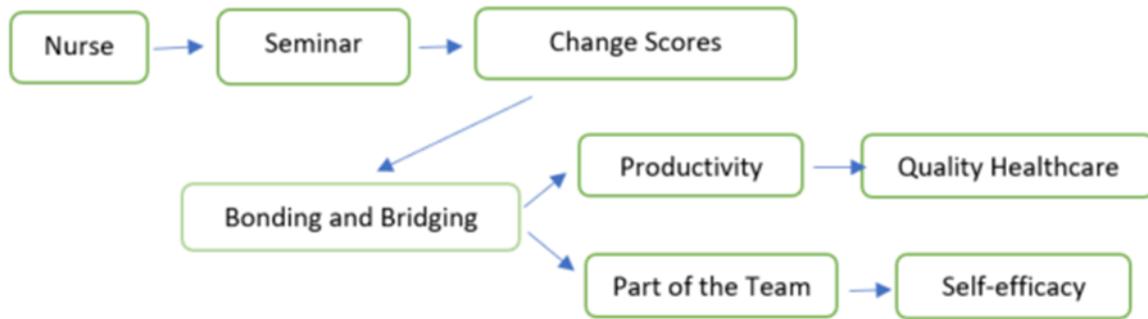| | Before education | After education | | |
|---|---|---|---|---|
| | *M (SD)* | *M (SD)* | Paired *t-test* | *p-value* |
| Total mean ISCS scores | 3.26 (0.50) | 3.44 (0.35) | 2.83 | 0.009 |
| Bonding Subscores | 3.08 (0.68) | 3.24 (0.61) | 1.25 | 0.22 |
| Bridging Subscores | 3.43 (0.63) | 3.83 (0.50) | 2.55 | 0.02 |

*Figure 1.  Human Capital Theory applied to study.*

**Appendix**

**Teleworking and Team Engagement Presentation Outline**

I.      Overview

II.     Definitions

      a.  Telework

      b.  Social Capital

      c.  Bonding

      d.  Bridging

III.    Telework

      a.  History of telework

      b.  Telework cost savings

      c.  Telework in the federal government

IV.     Actions to increase social capital

      a.  Organizational structure

      b.  Leadership buy-in

      c.  General ways to increase goodwill

            i.  Bonding

                  1.  Shared activities

                        a.  Virtual lunch

                        b.  Fitness goals

                        c.  Electronic picture album

                        d.  Team problem solving

                        e.  Virtual open mic

                f.   Sharing assessment tool results

                g.  Holiday party

    2.  Common goals

                a.  Organization mission and vision

                b.  Project team values

                c.  Project deadlines

                d.  Genuine interest in ideas and values of colleagues

    3.  Enhanced communication and transparency

                a.  Weekly team meeting

                b.  Routine "touch base" with staff through Skype

                c.  Monthly organization meetings for all staff

                d.  Newsletter

    4.  Transparency

  ii.  Bridging

    1.  Employee engagement

                a.  Reinforced goals and values

                b.  Committees composed of the right people

                c.  Advisory committee

                d.  Employee engagement survey

    2.  Supporting one another for mutual gain

                a.  Assist one another

                b.  Recognize staff

                c.  Share "best practices"

3.  Build and maintain formal and informal networks

    a.  Chit chat

    b.  Ice breaker questions

    c.  Online games

    d.  Virtual team builders

    e.  Video calls

    f.  GIF and meme's

    g.  Intentional celebratory spaces

V.   Online team building resources

VI.  References