2017

A Quantative Study of the Relationships Among Teacher Social Capital, School Leadership and School Performance in Colorado Schools

Ellen Jane Winiarczyk
University of Denver

A Quantative Study of the Relationships Among Teacher Social Capital, School Leadership and School Performance in Colorado Schools

Abstract

This study examined the relationship between teacher perceptions of teacher social capital, school leadership and school performance in schools across Colorado. The following three research questions framed the study: l) What is the evidence of teacher social capital within teacher perceptions of their school working conditions; 2) What is the relationship between teacher perceptions of school leaders and teacher social capital; and 3) What is the relationship between teacher social capital and school academic performance? Using data collected by the Colorado Department of Education in the 2015 Teaching, Empowering, Leading and Learning (TELL) survey of teachers, school leaders and other professional staff on teacher working conditions, this quantitative study used exploratory factor analysis, correlation and multiple linear regression to analyze data from over 997 schools. The regression analysis resulted in a strong finding that teacher bonding social capital explained 10% of the variance of school academic achievement. Teacher bonding social capital in combination with "precondition/energizers" variables (a factor comprised of school environmental conditions including opportunities, motivations and abilities) can explain up to a total of 18% of the variance in school academic outcomes. These two factors together are important levers for school leaders, teacher leaders and district principal supervisors to focus on in their efforts to improve school performance. In addition, two key actions for leaders is to develop and support the parent and community culture in schools as these were significant and positive sub-factors of teacher bonding social capital.

Document Type
Capstone

Degree Name
Ed.D.

Department
Educational Administration and Policy Studies

First Advisor
Susan Korach, Ed.D.

Second Advisor
Kent Seidel, Ph.D.

Third Advisor
Ellen Miller-Brown, Ph.D.

Keywords
Teacher social capital, Social capital, School leadership

Subject Categories
Educational Leadership | Other Education

Publication Statement

A QUANTATIVE STUDY OF THE RELATIONSHIPS AMONG TEACHER SOCIAL

CAPITAL, SCHOOL LEADERSHIP AND SCHOOL PERFORMANCE IN

COLORADO SCHOOLS

_____

A Doctoral Research Project

Presented to

The Faculty of the Morgridge College of Education

University of Denver

_____

In Partial Fulfillment

of the Requirements for the Degree

Doctor of Education

_____

By

Ellen Jane Winiarczyk

November 22, 2016

Advisor: Susan Korach, Ed.D.

Abstract

This study examined the relationship between teacher perceptions of teacher social capital, school leadership and school performance in schools across Colorado. The following three research questions framed the study: 1) What is the evidence of teacher social capital within teacher perceptions of their school working conditions?; 2) What is the relationship between teacher perceptions of school leaders and teacher social capital?; and 3) What is the relationship between teacher social capital and school academic performance? Using data from the 2015 Teaching, Empowering, Leading and Learning (TELL) survey of teachers, school leaders and other professional staff on teacher working conditions, this quantitative study used exploratory factor analysis, correlation and multiple linear regression to analyze data from over 997 schools. The regression analysis resulted in a strong finding that teacher bonding social capital explained 10% of the variance of school academic achievement. Teacher bonding social capital in combination with "precondition/energizers" variables (a factor comprised of school environmental conditions including opportunities, motivations and abilities) can explain up to a total of 18% of the variance in school academic outcomes. These two factors together are important levers for school le

aders, teacher leaders and district principal supervisors to focus on in their efforts to improve school performance. In addition, two key actions for leaders is to develop and support the parent and community culture in schools as these were significant and positive sub-factors of teacher bonding social capital.

Acknowledgements

No endeavor of the size and scope of a doctoral degree and research project can be accomplished without the support of many individuals. To my Doctoral Research Project committee, thank you for your enduring guidance, inspirational insights and patience with the process of my work. Dr. Susan Korach your inspiration, patience, and constancy pushed me to be a better student. Dr. Ellen Miller-Brown I always appreciated your hopefulness and optimism. Dr. Kent Seidel your inspirational research leadership led me through this research study. Your exceptional ability to make the research process and concepts understandable to me, and everyone you work with, elegantly guided my research process and supported me with keen insights and gentle kindness.

I wish to thank my doctoral cohort. We pulled together in many ways to support and guide each other. That made all the difference in having a positive experience while doing this degree together.

Last, and certainly not the least, is my love for and acknowledgement of my lifelong love and wife, Dr. Nicole Nicotera. Your encouragement, patience, and belief that I could do this degree was a constant support. You know how I learn and you supportively guided me through my process making made this endeavor much more fun and insightful. You taught me to love what you study and supported me unflinchingly. Thank you.

Table of Contents

List of Appendicies

List of Tables

List of Figures

Introduction

Social capital is defined as the intangible resources of social connections and people

networks that can be accessed and used to create action (Lin, 2001). There is a growing literature

base that examines the social capital and social network relationships in schools that teachers and

leaders create together, forming professional learning communities and improving student

achievement (Molinari & Sleegers, 2014; Deal, Purington, & Waetjen, 2009). Social capital in

schools has been found to play important role in predicting a school's organizational

performance and instructional quality (Leana & Pil, 2006). School leaders interact with and form

relationships with teachers and these associations act as connections that may involve

transferring resources such as work-related information, advice, and social support (Moolenaar

& Sleegers, 2015; Leana & Pil, 2006). The resulting social capital improves teaching practice by

building trust, enhancing teacher motivation, and enabling an environment where teachers work

together to develop new instructional techniques (Leana & Pil, 2006).

In schools a social network is developed as teachers seek out other teachers and other

staff for advice, modeling teaching, or as a mentor and the emerging relationship network

between teachers builds connectivity and support systems that benefit teachers, and students, as

they share resources and solve problems together (Deal, Purington, & Waetjen, 2009). Resulting

relationships may develop a school environment that fosters professional learning and sharing

that serves to develop teacher knowledge, skills and resources and can be found to be an

effective practice for school improvement (DuFour, Eakers, & DuFour, 2005).

Leithwood and Sun (2012) note "the linkage between principal leadership and student

achievement is inextricably tied to the actions of others in the school" (p. 423). Leaders who

thoughtfully use their school-based internal relationships access the social influence and

resources of those relationships and can impact teacher effectiveness and student achievement

(Yukl, et al., 2002; Louis, et al., 2010). Organizational scholars have advocated for motivating

followers through interpersonal relationships to better understand how a leaders' position in their

workplace, or school, social network can be a strategic approach in maximizing the knowledge

and material resources available in that network (Balkundi & Kilduff, 2006).

School leaders face many issues as they work to improve student achievement. Teacher

social capital has been identified as an approach to improve student achievement and school

performance when developed across teachers and staff (Leana & Pil, 2006). One challenge is to

understand how to measure teacher social capital and use the findings to guide school

improvement. This report details a quantitative research study conducted to explore the

relationship between teacher social capital, school leadership and school performance in schools

across Colorado, U.S.A. The study uses data from Colorado's 2015 Teaching, Empowering,

Leading and Learning (TELL) survey of teachers, school leaders and other professional staff that

gathers teacher perceptions of teaching and learning conditions in schools and districts

administered by the New Teacher Center (NTC, 2016). This research hopes to inform teacher

leaders, school leaders (principals and assistant principals) and principal supervisors about key

components of teacher social capital and school leadership that may influence a schools'

teaching environment and improve school performance and assist with school reforms.

TELL survey data was used because it represented a large statewide sample of teacher

perceptions of the school working conditions and leadership within their schools. A close

examination of TELL items found that many items are aligned with social capital constructs..

TELL was initiated in 2002 in North Carolina to assess teacher perceptions of the school

environment and now includes a core set of questions that address nine in-school teaching

conditions. They are: 1) Time, 2) Facilities and Resources, 3) Community Support and

Involvement, 4) Managing Student Conduct, 5) Teacher Leadership, 6) School Leadership, 7)

Professional Development, 8) Instructional Practices and Support, and 9) New Teacher Support.

(New Teacher Center, 2016). TELL data is used by state departments of education, school

districts and schools to inform teachers' and leaders' school improvement efforts by examining

the data collected from the school's survey respondents (i.e., teachers, principals, assistant

principals, school counselors, school psychologists) (New Teacher Center, 2013). The New

Teacher Center and Colorado Department of Education provide a few online resources are

available to assist teachers, school leaders or district personnel in interpreting TELL data.

Teachers and leaders can examine TELL data to inform them about school working conditions.

Social networks and teacher social capital are nested within the working conditions of schools,

and using TELL data as a tool to uncover and understand teacher social capital has the potential

to focus and influence school improvement efforts and may impact student achievement.

Minckler's (2011) model of a system of teacher social capital was used as a conceptual

framework for this study because it provided a comprehensive structure of in-school teacher

social capital factors and school leadership factors could be linked to components within the

TELL survey. Using two constructs within this model of teacher social capital, Precondition/

Energizers (P/E) and Teacher Bonding Social Capital (TBOSC), TELL questions were examined

to determine if they fit the construct's definition and then categorized within these constructs for

analysis for coherence, reliability and structure. These constructs, and their respective sub-scales

are defined in Table 1 and discussed further in the Data Source section of this paper.

Table 1

Scale and Subscale Definitions (Minckler, 2011)

Scale	Subscale	Definition

Precondition/ Energizer (P/E)		Components of the school environment needed for the development and operation of a teacher social network. Opportunity, motivation and ability (capacity) are needed to foster collaboration essential for the formation of teacher social capital (Adler & Kwon, 2002).
	Opportunity	Internal, and external, social ties in work settings where social relations may develop due to proximity, occupation, interest similarity, or work assignment (Scott, 1961; Adler & Kwon, 2002)
	Ability	The competencies and resources residing in the social network that can potentially be mobilized via relationships (Adler & Kwon, 2002). Resources can be tangible such as materials and equipment, as well as intangible such as skills, knowledge or information. Professional development and external organizations are venues for enriching the ability of a social network.
	Motivation	The need to participate in a social interaction from donors (persons who give) and recipients (persons who receive) in a transaction.
Teacher Bonding Social Capital (TBOSC)		The cohesiveness or strength of relationships among the teachers within the school (Minckler, 2011)
	Effective Teaching Beliefs & Practices (ETBP)	Addresses the degree to which teachers share the beliefs and practices of effective teachers (as identified in effective teaching research).
	Collaboration (Collab)	Addresses the degree to which the teachers collaborate to improve the quality of teaching and learning.
	Community Identity (CommID)	Reflect the degree to which the teacher identifies with or has her identity shaped as a community member of teachers within the school. Community identity indicates a mutual influence and shared emotional connection.
	Culture of Community (CultComm)	The degree to which the teachers within the school are experiencing community characterized by shared values and goals. Additionally, in this culture, teachers are experiencing high levels of trust and caring.

Three research questions guided this study: 1) What is the evidence of teacher social

capital within teacher perceptions of their school working conditions; 2) What is the relationship

between teacher perceptions of school leaders and teacher social capital; and 3) What is the

relationship between teacher social capital and school academic performance?

Literature Review

Social Capital

Social capital in education has been examined through a lens of external influences on

student achievement over the last 40 years. The idea that teacher social capital within a school

may also factor into school achievement has been a more recent addition (past 10 years) to

research efforts. Initially, the concept of capital was typically used in economics and business

and defined by economists as accumulated wealth, assets, labor and stock (Irving, 1896;

Bourdieu, 1986). The idea that capital can be a social resource was fostered by Coleman (1988)

as emanating from the skills, knowledge and education contained within a group, and

popularized by Putnam (2000) in his examination of diminishing social relationships in the U.S.

that support civic engagement in American communities. Coleman's (1988) social capital

research, however, began a more concerted effort into linking children's academic success to a

"strong sense of connection with their communities" and fostering social networks so children

feel safe and can trust those around them (Minckler, 2011, p. 68; Carbonaro, 2004). Research

that has examined education and social capital has looked at influences outside of the school

such as parents and community; (Coleman & Hoffer, 1987); family structure (Teachman, Paasch,

& Carver, 1996); the influences of parents (Coleman, 1988; Muller & Ellison, 2001); parent and

peers (Dika & Singh, 2002); and ethnic community interactions (Muller & Ellison, 2001) as

building on student achievement. Positive correlations have been found among a sense of

community, children's social capital, and wellbeing (self-reported) in a three year longitudinal

study of child data from Australian communities (Tennent, Farrell, and Tayler, 2005). This

research on education and social capital underscores the importance of social capital that

children bring to school from outside the school community. Thus, children who (a) demonstrate

a sense of connection to their communities, (b) can develop social networks around them, and (c)

feel safe and have trusting people around them are more likely to have successful school

experiences and outcomes, and stay in school (Tennent, Farrell, and Tayler, 2005). Developing

social networks in schools that share capital (e.g., resources, information, knowledge, etc.)

clearly benefits students, but also teachers. Further research into social capital in schools has

been shown to increase student engagement & achievement, and (Meire, 1999; Croninger & Lee

2001; Garcia-Reid, 2007; Uekawa, Aladjem, and Zhang, 2006) and teaching quality in schools

(Leana & Pil, 2006; Minckler, 2011). This next section will review a snapshot of the literature

that informs teacher social capital in schools.

Uekawa, Aladjem, & Zhang (2006) used 2002-2004 data from the National Longitudinal

Evaluation of Comprehensive School Reform to examine the effects of teacher social capital on

school reform efforts. Their survey research measured teacher social capital using three

indicators: (a) collegial cohesion (strength of teacher relationships), (2) collective commitment

(level of commitment to common goals), and (3) collegial influence (degree of influence on each

other over instructional issues). Their findings indicated that while some reform programs

increased teacher social capital more than others, those that emphasized shared vision and goals

resulted in higher levels of teacher social capital (Uekawa, Aladjem, & Zhang, 2006).

Penuel, Riel, Krause, and Frank (2009) used mixed methods (social network analysis,

surveys and interviews) to examine two elementary schools enacting significant school reform

changes to determine their success. The school that had greater success in reform efforts reported

"greater trust, respect and mutual regard developed among faculty" that was explained by the

"leadership beliefs and practices" specifically trusting internal resources, knowledge and

experience of teachers already working in the school rather than outside expert help (Penuel, et

al., 2009 p. 141). They found that "facilitating collaboration requires leadership that values

teacher expertise, knowledge of the current distribution of resources and expertise in a school,

and knowledge of practices, routines and artifacts that are in place that explain the distribution"

(Penuel, et al., 2009, p. 155).

Leana and Pil (2006) examined data collected from 88 urban schools in the same district

from interviews, surveys and time diaries. These researchers hoped to measure internal social

capital (specifically the dimensions of trust, sharing resources/information, and shared vision)

and tracked principal time with people from outside the school (external social capital). They

hypothesized that higher levels of internal and external social capital in a school is associated

with higher levels of school performance and that quality instruction may mediate the

relationship between internal and external social capital and student achievement as measured by

percent of students meeting or exceeding state math and reading standards (Leana & Pil, 2006).

They found that internal and external social capital was significantly correlated with student

achievement test scores and low student socioeconomic status had a negative influence on

student achievement. In addition, they determined that instructional quality is a significant

predictor of math and reading achievement and that internal and external social capital has a

significant influence on math achievement, but not on reading achievement (Leana & Pil, 2006).

They also found that social capital supported positive organizational performance (Leana & Pil,

2006).

Bridwell-Mitchell and Cooc (2016) use a stratified random sample of four elementary

schools from a longitudinal data set of teacher networks to determine how teachers maintained

their community ties rather than teachers' ties to individual teachers. The researchers used

surveys administered over 7 different time frames (e.g., fall, spring, etc.) to collect demographic

data and information pertaining to teacher perceptions of other teachers' teaching quality, and the

frequency of contact with other teachers in their school. This gave the researchers data on the

same teachers over 18 months to understand movement in their community relationships. The

analysis used a logistic cross-classified model as a hierarchical model. Their key outcome was

whether teachers upheld their relationship connections with their community colleagues and they

found that teachers maintained an average of 5.33 community colleagues over time from school

year to school year (accounting for attrition, etc.) and that time is not related to whether teachers

stay connected to earlier teacher colleagues (Bridwell-Mitchell & Cooc, 2016). Teacher's age,

gender and status in their school are related to staying current with community ties maintaining

the social capital connections between these colleague groups. The researchers also found that

too much community cohesion may work against innovative ideas as teachers may be too similar

in thought to come up with new ideas (Bridwell-Mitchell & Cooc, 2016). Of particular

importance to school leaders, this research found that reorganizing school structures (e.g., grade

levels, subject areas, etc.) does not foster social capital in informal teacher communities, but that

creating community cohesion is important to ensuring structural changes will be successful

(Bridwell-Mitchell & Cooc, 2016).

     Networks in schools form structures that provide for "opportunities and constraints" for

groups and individual teachers as they use data to inform their teaching strategies, find additional

resources, or access advice networks to find answers to persistent problems in a school (Deal, et

al., 2009). Collegial relationships (e.g., frequency and strengths between network ties) have been

found to facilitate more effective teaching networks (Purington, 2005). Deal, Purinton and

Waetjen's (2009) book *Making Sense of Social Networks in Schools* illustrates how social networks form in schools to develop strong collegial cultures and how school leaders can leverage the informal and formal networks to improve teaching quality and facilitate school change. Informed by the authors' research into school social networks this book identifies strategies school teachers and leaders can use to develop the social networks embedded within their school environments.

School Leadership and Teacher Social Capital

Education research has found that quality teachers and excellent teaching methods are the primary levers to increase student achievement, however, research has shown that school leaders are a strong secondary lever to increase student achievement (Marzano, Waters, McNulty, 2005; Leithwood, Louis, Anderson, & Wahlstrom, 2004). While the 1980s effective schools research clarify the function and role of principals as instructional managers who define the school's mission, manage the instructional program, and lead the school climate (Hallinger & Murphy, 1986), school districts are shifting school leader's work from managing operations to instructional ways of leading that build more collaborative school environments and improve instruction (Darling Hammond, Meyerson, LaPointe & Orr, 2007; Louis, Mayrowetz, Murphy, & Smylie, 2013; Drago-Stevenson & Blum-DeStefano, 2014). School leaders play an important role in improving student performance, but also in shaping the environment in which teachers work (Louis, Mayrowetz, Murphy, & Smylie, 2013; Drago-Stevenson & Blum-DeStefano, 2014). School leadership that uses instructional ways of leading develop more collaborative school environments and improve instruction (Darling Hammond, Meyerson, LaPointe & Orr, 2007; Louis, Mayrowetz, Murphy, & Smylie, 2013; Drago-Stevenson & Blum-DeStefano, 2014). School leadership has become more focused on instruction and distributed across the

school community, and leaders are embracing practices such as heightened teacher monitoring,

leading and guiding school level professional development, developing in-school schedules and

structures that enable data driven decision making, fostering collaborative teacher structures,

working with teacher leaders and coaches, modeling teaching, and helping to build and facilitate

professional learning communities (Wallace, 2013; Levin & Datnow, 2012; Darling-Hammond,

et al., 2010; Drago-Severson & Blum-DeStephano, 2014). School leaders are in a unique place to

implement processes and structures that foster school network development that may foster

teacher social capital expansion.

Conceptual Framework

Lin's (2001) definition of social capital as "resources embedded in social structure that

are accessed and/or mobilized in purposive actions" informs the conceptual framework guiding

this study. The social interaction of teachers within the school environment can influence

teachers action and this influence that may be found to be a small but not insignificant ingredient

that improves student achievement (Minckler, 2011). To organize how social capital may reside

in this school community I use Minckler's (2011) conceptual framework of teacher social capital

components (Figure 1.).

Figure 1. A model of a system of teacher social capital (Minkler, 2011).
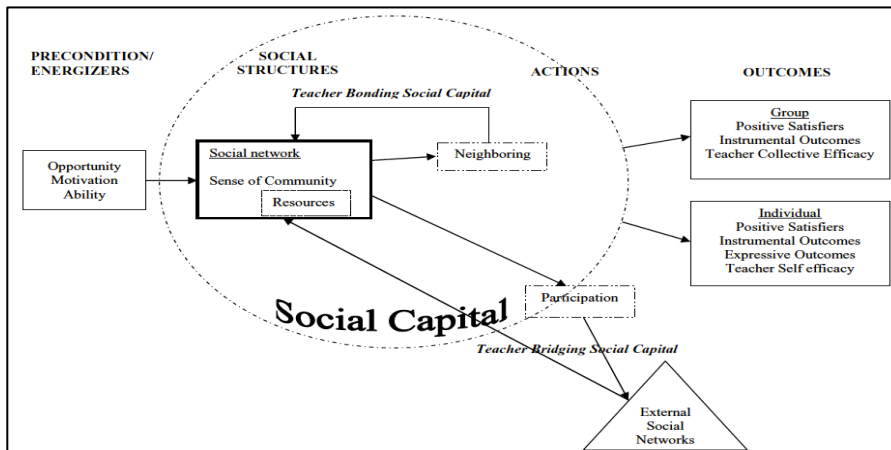
Components include: 1) Precondition/Energizers, or environmental elements that create the

conditions to develop social capital, 2) Social Structures such as Teacher Bonding Social Capital

and Teacher Bridging Social Capital that identify how people interact within and external to the

school, 3) Actions that include participation with colleagues within the school, and neighboring,

or mutual assistance, behaviors that bridge teachers to external organizations and people, and 4)

outcomes for groups and individuals that may lead to teacher efficacy, satisfiers (e.g., power,

reputation, recognition, growth or achievement), and expressive results (emotional and

physiological effects) (Minckler, 2011).

Influencing social capital in a school are the school leaders who shape many aspects of

the school environment thus impacting social capital development in different ways. School

leaders guide the vision, mission, expressed values and norms of a school shaping school culture

and focusing teachers on important efforts in reform, curriculum, and other areas (Murphy, 2006,

Leithwood, Aitken, & Jantzi, 2001). Instructional leadership is a complex construct in

educational research that has had a variety of definitional iterations, however, it is largely

defined as leadership that focuses on instruction with a clear purpose and commitment to

stgtudent learning (Zepeda, 2013). Schools are also increasing their distribution of leadership to

include teacher leaders, teacher coaches, mentors, and other structures that engage school leaders

and teachers in heightening the instructional skills, knowledge and methods of classroom

teachers (Spillane & Kim, 2004). It remains, however, that school leaders "help build a shared

meaning among members of the school staff regarding their purposes and create high levels of

commitment to accomplish these purposes" (Leithwood and Jantzi,1990, p. 10).

Transformational leadership practices are naturally suited to building relationships as

they serve to activate followers through inspiration and intrinsic motivation that by its very

nature develops bonds between leader and follower (Hallinger & Heck, 1998; Hallinger & Heck, 2010). Minkler (2011) draws a link between transformational leadership components to teacher social capital within a school and outside of the school. School leaders applying transformational leadership practices are predisposed to emphasizing behaviors that engender relationship building and are afforded a natural opportunity to build social capital (Moolinar & Sleegers, 2015). Leithwood and Sun (2012) note "the linkage between principal leadership and student achievement is inextricably tied to the actions of others in the school" (p. 423). Leaders who thoughtfully use their school-based internal relationships access the social influence and resources of those relationships and impact teacher effectiveness and student achievement (Yukl, et al., 2002; Louis, et al., 2010). Organizational scholars have advocated for motivating followers through interpersonal relationships to better understand how a leader's position in their workplace, school, or social network can be used in a strategic approach to maximize the knowledge and material resources available in that network (Balkundi & Kilduff, 2006). The importance of developing social capital throughout a school's teacher network may have important implications to the intentional relationship building school leaders, teacher leaders and teachers can practice to improve teaching quality and student achievement.

Three components of Minckler's model of teacher social capital (Figure 1) are used in this study to better understand their relationships. They are: 1) Precondition/Energizers (P/E), 2) Teacher Bonding Social Capital (TBOSC) and 3) School Leadership (Leadership). Note that this study does not label leadership as "transformational" due to a lack of specific transformational components not represented in TELL items, thus school leadership was used. TELL questions, or items, were examined through the lens of the three constructs' definitions to identify items that

closely aligned with the definitions (Table 1). The circled components of Leadership,

Precondition/Energizers and Teacher Bonding Social Capital are explored in this study.

Figure 2. Teacher social capital components studies in this research study.
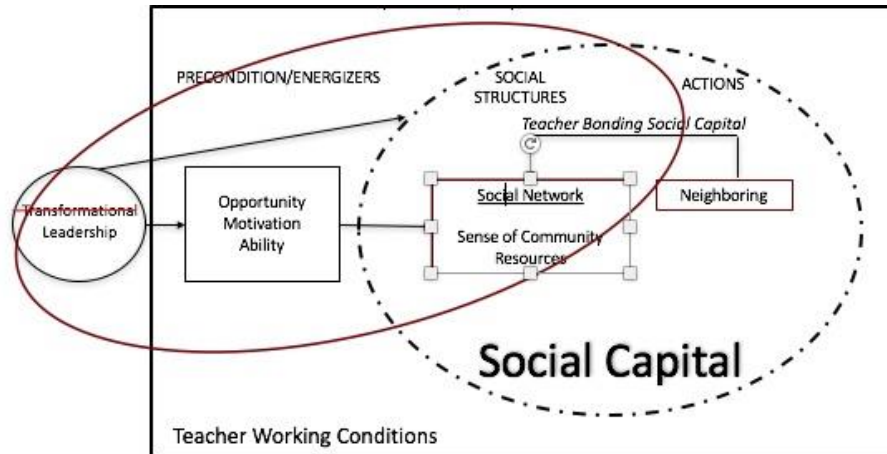
Precondition/Energizers are identified as "the substrate upon which teacher bonding

social capital can develop and be nurtured" while Teacher Bonding Social Capital is determined

by the degree to which teachers have opportunity to collaborate, are motivated to do so, and have

abilities to share when collaborating (Minckler, 2011, p. 147). Precondition/Energizers are

necessary to support the development of teacher social capital and include opportunities,

motivation and ability (Minkler, 2011). School leadership helps to create the culture and outline

the school's direction and purpose (Minckler, 2011). By studying the Precondition/Energizers,

Teacher Bonding Social Capital and School Leadership components individually and together

this study will gain specific insight into the ingredients that cultivate, foster and develop teacher

social capital in a school.

Methodology

The Colorado 2015 Teaching, Empowering, Leading and Learning (TELL) data set was

obtained from the Colorado Department of Education (CDE) in an Excel format and stored in a

secure, password protected electronic file at the University of Denver. The 205 item survey of

licensed and charter school educators assesses the perceptions of teaching conditions at the

school and school district and is intended to provide input into school and district improvements

(CDE, 2016). The survey is divided into 9 sections that include 1) Time, 2) Facilities and

Resources, 3) Community Support and Involvement, 4) Managing Student Conduct, 5) Teacher

Leadership, 6) School leadership, 7) Professional Development, 8) Instructional Practices and

Support, and 9) New Teacher Support. In Colorado TELL is offered every two years to teachers,

principals, assistant principals and other school personnel (e.g., school counselor, school

psychologist, social worker, etc.) online. Participants have access to the survey for 30 days and

use their school's password protected code to gain access to the survey. Schools that attain a

50% or more teacher and staff participation rate are included in the final data set released to

schools and the public for school improvement as well as further examination and analysis. This

study identified schools as elementary (grades K-6), middle (grades 6-8) and high schools

(grades 9-12).

The sample for this study included elementary, middle and secondary school teachers, in

Colorado who participated in the 2015 TELL survey whose schools had 50% staff participation

in the survey. TELL was selected as the data set for this study due its availability, the size of the

data set, the diversity of questions and that the questions were found to fit the construct

definitions outlined by Minckler (2011) in her teacher social capital model. In addition, the

TELL instrument was found to have content validity (Hirsch, 2009). For this study, a subset of

teacher only responses were extracted from 2015 TELL data received from the Colorado

Department of Education (CDE) that included 21,325 teacher cases distributed across 997

elementary and middle schools. Schools that had less than 5 respondents to the survey were

eliminated.

The P/E and TBOSC multiple item scales include sub-scales to more clearly identify concepts that enable teacher social capital development. *Precondition/Energizers* have three additional subscales that foster the collaboration essential for the formation of teacher social capital (Adler & Kwon, 2002). They are: 1) *Opportunity* – the internal, and external, social ties in work settings where social relations may develop due to proximity, occupation, interest similarity, or work assignment (Scott, 1961), 2) *Motivation* – the need to participate in a social interaction from donors (persons who give) and recipients (persons who receive) in a transaction, and 3) *Ability* - the competencies and resources residing in the social network that can potentially be mobilized via relationships (Adler & Kwon, 2002).

The construct *Teacher Bonding Social Capital (TBOSC)* has scales that include: 1) *Effective Teaching Belief and Practices (ETBP)* which addresses the degree to which teachers share the beliefs and practices of effective teachers (as identified in effective teaching research); 2) *Collaboration* addresses the degree to which the teachers collaborate to improve the quality of teaching and learning; 3) *Community Identity* reflects the degree to which the teacher identifies with or has her identity shaped as a community member of teachers within the school and indicates mutual influence and shared emotional connection; 4) *Culture of Community* is the degree to which teachers in a school experience community characterized by shared values and goals, and where teachers also experience high levels of trust and caring (Minckler 2011). Scale and sub-scale definitions are found in Table 1.

Minkler (2011) identifies School Leadership and its contributing relationship to Precondition/Energizers and Teacher Bonding Social Capital, and found transformational leadership as an important factor in developing teacher social capital. Although the components of transformational leadership are well known as highly successful school leadership practices

(Leithwood & Jantzi, 1990, Leithwood, Louis, Anderson & Wahlstrom, 2004), they were not

used for this study as there was not a substantial number of items to support naming school

leadership specifically as transformational.

School performance data is drawn from the Colorado Department of Education (CDE)

data 2013-14, the year just prior to the spring 2015 administration of the TELL survey, and the

last year of consistent longitudinal student assessment data in the state. In 2009, the Colorado

Department of Education (CDE) developed the District and School Performance Framework

(DPF, SPF) as a part of the state's system of school accountability and support to provide a

common framework to understand school performance at each school level and help to improve

efforts in reading, writing and mathematics (CDE, 2016). In the 2013-2014 academic year, the

Transitional Colorado Assessment Program (TCAP) was developed to bridge the state's

assessment transition from the Colorado Student Assessment Program (CSAP) as the state

developed new Colorado Academic Standards (CAS). The state then transitioned to Partnership

for Assessment of Readiness for College and Careers, or PARCC, assessments which they

currently use.

Because state school performance data was in a period of assessment transition in 2015,

TCAP data was determined to be the best data in which to examine school performance for this

research. CDE developed four measures to gauge school performance. They are: 1) academic

achievement, 2) academic growth, 3) academic growth gaps, and 4) post-secondary and

workforce readiness. For this study, I determined that three school performance measures were

viable. They are: 1) academic achievement, 2) academic growth, and 3) academic growth gaps.

Academic achievement is calculated by the percentage of students scoring proficient or

advanced on TCAP in math, reading and writing in grades three through ten (CDE, 2015).

Academic growth is defined as the median and adequate student growth percentiles in reading, writing and math, for the school and district using TCAP. Academic growth gaps are the median and adequate student growth percentile in reading, writing and math in disaggregated groups on TCAP. In other words, growth gaps ask if there are differences in the level of achievement of groups of students of different races, ethnicities, native languages or socio-economic status (CDE, 2014). Districts and schools receive a rating on each of the performance indicators: Exceeds (4 points), Meets (3 points), Approaching (2 points), Does not meet (1 point). In this study indicators were converted to numeric ratings (points) and used to examine academic achievement and growth as well as growth gaps.

The nature of the focus of this study, *teacher bonding social capital*, raises the question of whether a 2-level model, teachers nested in schools, is needed to fully understand the interactions of variables and their relationship to student outcomes data. To test whether a more complex hierarchical model was needed, I tested the impact of teachers' membership in a school using a dummy variable in the linear regression models. While I did find statistical significance for the school membership variable, the variance explained in every case was less than one percent (significance was due to the very large dataset). I therefore decided to proceed with a more straight-forward linear regression rather than hierarchical models, to keep the analysis and findings more easily interpretable for sophisticated, non-research audiences.

Data Analysis

The TELL survey's 205 items were examined to identify their fit to the constructs and their sub-scales. One hundred and five (105) items corresponded with the constructs and their subscale definitions including 49 Teacher Bonding Social Capital items, 36 Precondition/ Energizer items and 20 School Leadership items (Table 2). This table includes items that were

eliminated after the first exploratory factor analysis used to determine if each construct's sub-

scales would hold together and if items did not load on a specific factor.

Table 2

Exploratory Factor Analysis (EFA) Scales and Subscales Items and Eliminated Items

Scale/Subscale	Exploratory Factor Analysis Items	Items Eliminated After EFA
Precondition/ Energizers (3 subscales, 36 items)		
Ability (23 items)	Parents/guardians support teachers, contributing to their success with students.	
Ability	Professional development enhances teachers' ability to implement instructional strategies that meet diverse student learning needs.	
Ability	Teachers and students have access to current, diverse and ability-appropriate materials through the library.	
Ability	Professional development enhances teachers' abilities to improve student learning.	
Ability	Professional development deepens teachers' content knowledge.	
Ability	Provided supports (i.e., instructional coaching, professional learning communities) translate to improvements in instructional practices by teachers.	
Ability	Teachers in this school have the support needed to provide culturally- and developmentally-responsive instruction to support the academic and behavioral needs of every student.	
Ability	As a beginning teacher, I have received the following kinds of supports during this school year: Formally assigned mentor	Eliminated
Ability	As a beginning teacher, I have received the following kinds of supports during this school year: Seminars specifically designed for new teachers	Eliminated
Ability	As a beginning teacher, I have received the following kinds of supports during this school year: Formal time to meet with mentor during school hours	Eliminated
Ability	On average, how often did you engage in each of the following activities with your mentor during this school year? Observing my mentor's teaching	Eliminated
Ability	Overall, the additional support I received as a new teacher during this school year improved my instructional practice.	Eliminated
Ability	Community members support teachers, contributing to their success with students.	

Ability	Overall, the additional support I received as a new teacher during this school year has helped me to impact my students' learning.	Eliminated
Ability	Overall, the additional support I received as a new teacher during this school year has been important in my decision to continue teaching at this school.	Eliminated
Ability	Please indicate the role teachers have at your school in each of the following areas: Selecting instructional materials and resources	
Ability	Administration supports teachers' efforts to maintain discipline in the classroom.	
Ability	Teachers are recognized as educational experts.	
Ability	Please indicate the role teachers have at your school in each of the following areas: The selection of teachers new to this school	
Ability	Sufficient resources are available for professional development in my school.	
Ability	Professional development provides teachers with the knowledge and skills most needed to teach effectively.	
Ability	Please indicate the role teachers have at your school in each of the following areas: Establishing student discipline procedures	
Ability	Teachers have an appropriate level of influence on decision making in this school.	
Motivation (3 items)	Of the hours spent on school-related activities outside of the regular school day, how many are spent on other school-related activities such as preparation, grading, parent conferences or attending meetings?	
Motivation	In an average week, how much time do you devote communicating with parents/guardians and/or the community during the school day	
Motivation	In an average week of teaching, how many hours do you spend on school-related activities outside of the regular school day (before or after school, and/or on weekends)?	
Opportunity (10 items)	In an average week, how much time do you devote professional development during the school day	Eliminated
Opportunity	As a beginning teacher, I have received the following kinds of supports during this school year: Regular communication with principals, other administrator, or department chair	Eliminated
Opportunity	How much did the support you received from your mentor influence your practice in the following areas during this school year? Connecting with key resource professionals (e.g., coaches, counselors, etc.)	Eliminated
Opportunity	Teachers have sufficient access to appropriate instructional materials and resources.	
Opportunity	Teachers have sufficient access to a broad range of professional personnel.	

Opportunity	Teachers are relied upon to make decisions about educational issues.	
Opportunity	Teachers are provided opportunities to take on formal leadership roles in the school (e.g., mentor, instructional coach).	
Opportunity	In an average week, how much time do you devote required committee and/or staff meetings during the school day.	Eliminated
Opportunity	Professional development provides ongoing opportunities for teachers to work with colleagues to refine teaching practices.	
Opportunity	An appropriate amount of time is provided for professional development.	
Teacher Bonding Social Capital (4 subscales)		
Collaborate (11 items)	Teachers have time available to collaborate with colleagues.	
Collaborate	In an average week, how much time do you devote to: collaborative planning time during the school day	Eliminated
Collaborate	As a beginning teacher, I have received the following kinds of supports during this school year: access to professional learning communities where I could discuss concerns with other teacher(s)	Eliminated
Collaborate	How much did the support you received from your mentor influence your practice in the following areas during this school year: Working collaboratively with other teachers at my school	Eliminated
Collaborate	Teachers receive appropriate training and guidance from school library staff to help students to become proficient in 21st century skills.	Eliminated
Collaborate	The faculty has an effective process for making group decisions to solve problems.	
Collaborate	Please indicate the role teachers have at your school in each of the following areas: School improvement planning	
Collaborate	This school has an effective approach (e.g., referral/identification process, scheduling, collaborative teaming, supplemental resources, accommodation practices) in place to meet the needs of students in special education.	
Collaborate	This school has an effective approach (e.g., identification process, scheduling, collaborative teaming, instruction for language development) in place to meet the needs of English language learners.	
Collaborate	Teachers work in professional learning communities to develop and align instructional practices.	

Collaborate	As a beginning teacher, I have received the following kinds of supports during this school year: common planning time with other teachers	Eliminated
Culture of community (18 items)	Teachers in this school trust each other.	
Culture of community	Teachers are trusted to make sound professional decisions about instruction.	
Culture of community	Teachers are effective leaders in this school.	
Culture of community	Teachers are encouraged to reflect on their own practice.	
Culture of community	Teachers are encouraged to try new things to improve instruction.	
Culture of community	Teachers have autonomy to make decisions about instructional delivery (i.e., pacing, materials, and pedagogy).	
Culture of community	Overall, my school is a good place to work and learn.	
Culture of community	As a beginning teacher, I have received the following kinds of supports during this school year: release time to observe other teachers	Eliminated
Culture of community	On average, how often did you engage in each of the following activities with your mentor during this school year: reflecting on the effectiveness of my teaching together	Eliminated
Culture of community	How much did the support you received from your mentor influence your practice in the following areas during this school year: creating a supportive, equitable classroom where differences are valued	Eliminated
Culture of community	How much did the support you received from your mentor influence your practice in the following areas during this school year: enlisting the help of family members, parents, and/or guardians	Eliminated
Culture of community	There is an atmosphere of trust and mutual respect in this school.	
Culture of community	The faculty and leadership have a shared vision.	
Culture of community	Teachers feel comfortable raising issues and concerns that are important to them.	
Culture of community	The school works directly with parents/guardians to improve the educational climate in students' homes.	
Culture of community	This school maintains clear, two-way communication with the community.	
Culture of community	This school does a good job of encouraging parent/guardian involvement.	

Culture of community	Teachers provide parents/guardians with useful information about student learning.	
Effective teaching beliefs & practices (ETBP) (17 items)	Teachers have sufficient instructional time to meet the needs of all students.	
ETBP	Follow-up is provided from professional development in this school.	
ETBP	Teachers in this school use formative assessments in their classroom to make appropriate adjustments to instruction.	Eliminated
ETBP	On average, how often did you engage in analyzing student work with your mentor during this school year	Eliminated
ETBP	On average, how often did you engage in reviewing results of students' assessments with your mentor during this school year?	Eliminated
ETBP	How much did the support you received from your mentor influence your practice in instructional strategies during this school year?	Eliminated
ETBP	How much did the support you received from your mentor influence your practice in subject matter I teach during this school year?	Eliminated
ETBP	How much did the support you received from your mentor influence your practice in using data to identify student needs during this school year?	Eliminated
ETBP	How much did the support you received from your mentor influence your practice in differentiating instruction based upon individual student needs and characteristics during this school year?	Eliminated
ETBP	The non-instructional time provided for teachers in my school is sufficient.	
ETBP	Teachers are allowed to focus on educating students with minimal interruptions.	
ETBP	Please indicate the role teachers have at your school in each of the following areas: Devising teaching techniques	
ETBP	Please indicate the role teachers have at your school in each of the following areas: Setting grading and student assessment practices	
ETBP	The teacher evaluation process improves teachers' instructional strategies.	
ETBP	Teachers are protected from duties that interfere with their essential role of educating students.	
ETBP	Please indicate the role teachers have at your school in each of the following areas: Determining the content of in-service professional development programs	
ETBP	The components of the teacher evaluation process accurately identify effectiveness.	
Community identity (3 items)	In this school we take steps to solve problems.	
Community identity	Teachers in this school receive informal feedback about their teaching on an ongoing basis.	

Community identity	Providing emotional support	
Leadership (20 items)	Administration consistently enforces rules for student conduct.	
Leadership	The school leadership focuses on the professional growth of staff.	
Leadership	The school leadership makes a sustained effort to address teacher concerns about: Leadership issues	
Leadership	The school leadership makes a sustained effort to address teacher concerns about: Facilities and resources	
Leadership	The school leadership makes a sustained effort to address teacher concerns about: The use of time in my school	
Leadership	The school leadership makes a sustained effort to address teacher concerns about: Professional development	
Leadership	The school leadership makes a sustained effort to address teacher concerns about: Empowering teachers	
Leadership	The school leadership makes a sustained effort to address teacher concerns about: Community engagement	
Leadership	The school leadership makes a sustained effort to address teacher concerns about: Student learning	
Leadership	The school leadership makes a sustained effort to address teacher concerns about: New teacher support	
Leadership	Overall, the school leadership in my school is effective.	
Leadership	School leadership participates in professional development opportunities with teachers.	Eliminated
Leadership	Teachers are assigned classes that maximize their likelihood of success with students.	Eliminated
Leadership	The school leadership communicates clear expectations to students and parents.	
Leadership	The school leadership communicates with the faculty adequately.	
Leadership	The school leadership works to minimize disruptions for teachers, allowing teachers to focus on educating students.	
Leadership	The school leadership consistently supports teachers.	
Leadership	Teachers are held to high professional standards for delivering instruction.	
Leadership	The school leadership facilitates using data to improve student learning.	
Leadership	The faculty are recognized for accomplishments.	

Respondents answered each item using Likert-like scaled items that used different rating

scales. Table 3 identifies the different rating scales used in the TELL survey that ranged from 1

to 5, 1 to 6 and a 1 = yes and 2 = no scale. For the analysis scales were converted to z scores and

then factor scores to neutralize the difference in scale responses.

Table 3

TELL 2015 Likert-like Scales Used

Number of TELL Items	1	2	3	4	5	6
72	Strongly disagree	Disagree	Agree	Strongly agree	Don't know.	
7	No role at all	Small role	Moderate role	Large role	Don't Know	
6	None	Less than or equal to 1 hour	More than 1 hour but less than or equal to 3 hours	More than 3 hours but less than or equal to 5 hours	More than 5 hours but less than or equal to 10 hours	More than 10 hours
4	Never	Less than once per month	Once per month	Several times per month	Once per week	Almost daily
6	Yes	No				

The 2015 TELL data was organized to ensure that cases with missing data and schools

with less than five respondents were eliminated and organized into a teacher only response data

set. The scale and sub-scale reliability analysis yielded two important pieces of information

relevant to working with this data set. First, TELL responses from first year teachers were found

to be significantly different from the other teachers in the school, and added substantial

measurement error to the dataset. I decided to eliminate these novice teachers from the analysis.

Given that the fact that novice teachers may by definition, not yet be major players in the

teaching bonding social capital in the school (due to their newness), and given that their answers

were substantially more varied than responses from more experienced teachers in the school, I

believe this study gains a clearer picture of the Teacher Bonding Social Capital (TBOSC) and

related variables when using only teachers with two or more years of teaching experience in the

school. Thus first year teacher cases were eliminated. The early exploratory factor analysis using

principal components analysis did determine the elimination of several items (see Table 2).

Table 4 summarizes the Cronbach's alpha results for the exploration of each scale and

subscale, and items that were eliminated items to improve each subscale's reliability score (see

Table 2). The Precondition/Energizer scale contained a total 36 items initially, and was reduced

to 24 items when examined for reliability (α = .903). Specifically, the Opportunity subscale

initially contained 10 items while 4 were eliminated (two items each from TELL sections Time

and New Teacher Mentoring) (α = .783). The Motivation subscale contained three items

initially, however the first reliability analysis revealed a Cronbach's alpha of .646. With the

elimination of one Time section item the resulting two item alpha was .804. No items were

eliminated from the Ability sub-scale.

Table 4

Exploratory Scale and Subscale Reliability Coefficient Scores

Scale or Subscale	Cronbach's Alpha (after items eliminated)	Initial Number of Items	No. of Items after reliability analysis
Precondition/ Energizers	.903	36	24
Opportunity	.783	10	6
Ability	.904	23	16
Motivation	.804	3	2
TBOSC	.930	49	32
ETBP	.804	17	10
Community Identity	.577	3	2
Culture of Community	.891	18	14
Collaboration	.885	11	6
Leadership	.938	20	20

The TBOSC scale revealed strong reliability (α = .930) after the 49 item scale was

reduced to 32 items. TBOSC subscale Effective Teaching Beliefs and Practices began with 17

items and was reduced to 10 items revealing an alpha of .804. Six items eliminated were from

the New Teacher Mentoring section and the seventh item eliminated was the question "Teachers

in this school use formative assessments in their classroom to make appropriate adjustments to

instruction" (item Q9.1.d). TBOSC sub-scale Community Identity had 3 items, but one item was

eliminated as it was from the New Teacher Mentoring section. Community Identity items

resulted in an alpha of .577. The Culture of Community subscale had 18 initial items identified

and was reduced to 14 items (α = .930). All four of the eliminated items were from the New

Teacher Mentoring section. TBOSC subscale Community was reduced from 11 items to 6 items

and reliability resulted in an alpha of .885. The full Leadership scale retained all 20 items

initially identified (α = .937).

To further refine the subscales and identify if items in the existing subscales loaded to

form new factors, an Exploratory Factor Analysis (EFA) of the three constructs was performed.

Principal Components Analysis (PCA) extraction method was used to examine each of the three

scales to determine the strength of item associations within each scale, validate the existing

constructs or identify new subscale associations, and further reduce the scale items. PCA also

identified the variance explained by each factor producing a mathematically unique solution to

the relationship of the items within a scale (Frankfort-Nachmias & Leon-Guerrero, 2011).

An orthogonal Varimax rotation was used for each scale's analysis to minimize the factor

complexity so that factors were uncorrelated with each other to ensure that items were clearly

associated with their factor and to maximize the variance of loadings on each factor.

Components with an eigenvalue greater than 1.0 were selected as the solution for each construct

and factor with a loading of .500 or greater was used to identify practically significant items that

loaded strongly on each component solution.

The PCA conducted on the Precondition/Energizer scale identified a 5 factor solution and

is represented in Table 5 and includes each subscale's new names and reliability data. Subscale

names include: 1) Professional Development for Instruction, 2) Teacher Expertise, 3) Teachers

Access to Resource Supports (eliminated), 4) Parent and Community Support, and 5) Time

Supports.

Table 5

Preconditioner/Energizer Subscale EFA Results (including items by subscale and reliability
coefficients)

Preconditioner/Energizer Subscale	Items	Cronbach's Alpha .893 (overall scale)
Component 1: Professional Development for Instruction (8 items)	Provided supports (i.e., instructional coaching, professional learning communities) translate to improvements in instructional practices by teachers. Professional development provides ongoing opportunities for teachers to work with colleagues to refine teaching practices. Professional development deepens teachers' content knowledge. Professional development enhances teachers' abilities to improve student learning. Professional development enhances teachers' ability to implement instructional strategies that meet diverse student learning needs. Sufficient resources are available for professional development in my school. Professional development provides teachers with the knowledge and skills most needed to teach effectively. An appropriate amount of time is provided for professional development.	.922
Component 2: Teacher Expertise (9 items)	Teachers are relied upon to make decisions about educational issues. Teachers are recognized as educational experts. Teachers have an appropriate level of influence on decision making in this school.	.868

	Teachers are provided opportunities to take on formal leadership roles in the school (e.g., mentor, instructional coach). What is the role teachers have at your school in selecting instructional materials and resources. What is the role teachers have at your school in the selection of teachers new to this school. What is the role teachers have at your school in establishing student discipline procedures. Teachers in this school have the support needed to provide culturally- and developmentally-responsive instruction to support the academic and behavioral needs of every student. Administration supports teachers' efforts to maintain discipline in the classroom.	
Component 3: Teachers Access to Resource Supports (3 items)	Teachers have sufficient access to appropriate instructional materials and resources. Teachers and students have access to current, diverse and ability-appropriate materials through the library. Teachers have sufficient access to a broad range of professional personnel.	.653 (Eliminated)
Component 4: Parent and Community Support (2 items)	Parents/guardians support teachers, contributing to their success with students. Community members support teachers, contributing to their success with students.	.819
Component 5: Time Supports (2 items)	In an average week of teaching, how many hours do you spend on school-related activities outside of the regular school day (before or after school, and/or on weekends)? Other school-related activities such as preparation, grading, parent conferences or attending meetings?	.804

Reliability coefficients were obtained for the components with an overall scale alpha of

.893. Component 3 was dropped from the Precondition/Energizer scale due to a low alpha of

.653. The resulting 21 items in 4 subscales were kept to finalize the P/E scale with an alpha of

.893. Table 6 outlines the newly named P/E factors as: 1. Professional Development for

Instruction; 2. Teacher Expertise; 3. Parent and Community Supports; and 4. Time Supports and

their corresponding items.

Table 6 illustrates the Precondition/Energizer scale's PCA rotated component matrix

showing the factor loadings for each of the five components and the variables.

Table 6

Preconditioner/Energizer PCA Factor Loading and New Factor Names

Items / New Factor Name	1. Professional Development for Instruction	2. Teacher Expertise	3 Teacher Access to Resource Supports (Eliminated)	4. Parent & Community Supports	5. Time Supports
Instructional Practices & Supports: Provided supports (i.e., instructional coaching, professional learning communities) translate to improvements in instructional practices by teachers.	**0.558**	0.345	0.176	0.102	-0.043
Professional development provides ongoing opportunities for teachers to work with colleagues to refine teaching practices.	**0.805**	0.238	0.175	0.079	-0.010
Teachers are encouraged to reflect on their own practice.	**0.756**	0.263	0.001	0.156	-0.055
Professional development enhances teachers' abilities to improve student learning.	**0.822**	0.293	0.085	0.096	-0.013
Professional development enhances teachers' ability to implement instructional strategies that meet diverse student learning needs.	**0.804**	0.279	0.113	0.087	-0.033
Sufficient resources are available for professional development in my school.	**0.698**	0.189	0.368	0.055	-0.007
Professional development provides teachers with the knowledge and skills most needed to teach effectively.	**0.829**	0.254	0.155	0.094	-0.013
An appropriate amount of time is provided for professional development.	**0.672**	0.139	0.250	0.033	-0.047
Teachers are relied upon to make decisions about educational issues.	0.287	**0.752**	0.151	0.130	-0.055
Teachers are recognized as educational experts.	0.281	**0.724**	0.184	0.156	-0.060
Teachers have an appropriate level of influence on decision making in this school.	0.233	**0.695**	0.076	0.045	-0.057
Teachers are provided opportunities to take on formal leadership roles in the school (e.g., mentor, instructional coach).	0.301	**0.621**	0.204	0.072	-0.011
Teacher role in: Selecting instructional materials and resources	0.061	**0.531**	0.317	0.023	0.020

Teacher role in: The selection of teachers new to this school	0.143	**0.590**	0.097	0.045	0.065
Teacher role in: Establishing student discipline procedures	0.239	**0.630**	-0.016	0.158	-0.026
Teachers in this school have the support needed to provide culturally- and developmentally-responsive instruction to support the academic and behavioral needs of every student.	0.355	**0.473**	0.305	0.222	-0.057
Administration supports teachers' efforts to maintain discipline in the classroom.	0.236	**0.625**	0.134	0.253	-0.014
Teachers have sufficient access to appropriate instructional materials and resources.	0.229	0.232	**0.670**	0.122	-0.064
Teachers and students have access to current, diverse and ability-appropriate materials through the library	0.162	0.116	**0.714**	0.178	-0.003
Teachers have sufficient access to a broad range of professional personnel.	0.237	0.234	**0.666**	0.055	-0.034
Community members support teachers, contributing to their success with students.	0.163	0.237	0.174	**0.845**	-0.014
Parents/guardians support teachers, contributing to their success with students.	0.144	0.227	0.165	**0.860**	-0.001
In an average week of teaching, how many hours do you spend on school-related activities outside of the regular school day (before or after school, and/or on weekends)?	-0.048	-0.026	-0.028	-0.009	**0.909**
Other school-related activities such as preparation, grading, parent conferences or attending meetings?	-0.047	-0.021	-0.047	-0.007	**0.909**

The PCA conducted on the Teacher Bonding Social Capital (TBOSC) scale identified a 7

factor solution and is represented in Table 7 and includes each scale's new name and reliability

data. The new subscale names include: 1) Teacher Leader Culture, 2) Effective Use of Teacher

Time, 3) Community Parent Culture, 4) Teacher Role in Instruction, 5) Effective Teaching

Practice, 6) Teacher Evaluation, and 7) Teacher Supports for English Language Learners and

Special Education (eliminated).

Table 7

Teacher Bonding Social Capital Subscale EFA Results (including items by subscale and reliability coefficients)

Teacher Bonding Social Capital Subscale	Items	Cronbach's Alpha

Component 1: Teacher Leader Culture (9 items)	There is an atmosphere of trust and mutual respect in this school. In this school we take steps to solve problems. Teachers feel comfortable raising issues and concerns that are important to them. The faculty has an effective process for making group decisions to solve problems. Teachers in this school trust each other. The faculty and leadership have a shared vision. Teachers are effective leaders in this school. Teachers are trusted to make sound professional decisions about instruction. Overall, my school is a good place to work and learn.	.909
Component 2: Effective use of Teacher Time (5 items)	Teachers have time available to collaborate with colleagues. Teachers are allowed to focus on educating students with minimal interruptions. Teachers are protected from duties that interfere with their essential role of educating students. Teachers have sufficient instructional time to meet the needs of all students. The non-instructional time provided for teachers in my school is sufficient.	.783
Component 3: Community Parent Culture (4 items) (all in Culture of Community)	The school works directly with parents/guardians to improve the educational climate in students' homes. This school maintains clear, two-way communication with the community. This school does a good job of encouraging parent/guardian involvement. Teachers provide parents/guardians with useful information about student learning.	.779
Component 4: Teacher Role in Instruction (3 items)	What is the role teachers have at your school in setting grading and student assessment practices. What is the role teachers have at your school in devising teaching techniques. Teachers have autonomy to make decisions about instructional delivery (i.e., pacing, materials, and pedagogy).	.707
Component 5: Effective Teaching Practice (3 items)	Teachers work in professional learning communities to develop and align instructional practices. Teachers are encouraged to reflect on their own practice. Follow-up is provided from professional development in this school.	.638

Component 6: Teacher Evaluation (2 items)	The components of the teacher evaluation process accurately identify effectiveness. The teacher evaluation process improves teachers' instructional strategies.	.854
Component 7: Teacher Supports for English Language Learners and Special Education (2 items)	This school has an effective approach (e.g., identification process, scheduling, collaborative teaming, instruction for language development) in place to meet the needs of English language learners. This school has an effective approach (e.g., referral/identification process, scheduling, collaborative teaming, supplemental resources, accommodation practices) in place to meet the needs of students in special education.	.641

Table 8 illustrates the Teacher Bonding Social Capital (TBOSC) scale's PCA rotated

component matrix showing the factor loadings for each of the 7 components and the variables.

Table 8

TBOSC PCA Factor Loading and New Factor Names

Item/New Factor Names	1 Teacher Leadership Culture	2 Effective Use of Teacher Time Use	3 Community Parent Communication	4 Teacher Role in Instruction	5 Effective Teaching Practice	6 Teacher Evaluation	7 Teacher Supports ELL & SPED (Eliminated)
There is an atmosphere of trust and mutual respect in this school.	**0.782**	0.150	0.129	0.128	0.151	0.144	0.065
There is an atmosphere of trust and mutual respect in this school.	**0.725**	0.146	0.231	0.145	0.205	0.099	0.076
Teachers feel comfortable raising issues and concerns that are important to them.	**0.712**	0.167	0.115	0.196	0.153	0.219	0.041
The faculty has an effective process for making group decisions to solve problems.	**0.692**	0.136	0.202	0.114	0.23	0.125	0.059
The faculty has an effective process for making group decisions to solve problems.	**0.682**	0.087	0.101	0.047	0.128	0.016	0.106
The faculty and leadership have a shared vision.	**0.67**	0.129	0.172	0.112	0.211	0.208	0.07
Teachers are effective leaders in this school.	**0.665**	0.097	0.208	0.177	0.215	0.035	0.085

Teachers are trusted to make sound professional decisions about instruction.	**0.598**	0.242	0.132	0.416	0.113	0.143	0.062
Overall, my school is a good place to work and learn.	**0.55**	0.177	0.161	0.138	0.077	0.088	0.111
Teachers have time available to collaborate with colleagues.	0.101	**0.715**	0.039	0.027	0.326	-0.007	0.001
Teachers are allowed to focus on educating students with minimal interruptions.	0.288	**0.642**	0.133	0.152	0.013	0.172	0.061
Teachers have sufficient instructional time to meet the needs of all students.	0.098	**0.681**	0.052	0.133	-0.028	0.078	0.111
The non-instructional time provided for teachers in my school is sufficient.	0.105	**0.751**	0.056	0.086	0.177	0.046	0.032
Teachers are protected from duties that interfere with their essential role of educating students.	0.247	**0.615**	0.096	0.141	0.057	0.155	0.037
The school works directly with parents/guardians to improve the educational climate in students' homes.	0.162	0.09	**0.683**	0.119	0.054	0.112	0.138
This school maintains clear, two-way communication with the community.	0.274	0.121	**0.756**	0.1	0.114	0.064	0.075
This school does a good job of encouraging parent/guardian involvement.	0.261	0.086	**0.783**	0.076	0.118	0.062	0.058
Teachers provide parents/guardians with useful information about student learning.	0.143	0.035	**0.673**	0.027	0.172	-0.022	0.063
What is the role teachers have in: Setting grading and student assessment practices	0.086	0.129	0.072	**0.767**	0.079	0.088	0.034
What is the role teachers have in: Devising teaching techniques	0.231	0.114	0.09	**0.763**	0.082	0.033	0.056
Teachers have autonomy to make decisions about instructional delivery (i.e., pacing, materials, and pedagogy).	0.254	0.19	0.063	**0.611**	0.076	0.083	0.219
Teachers work in professional learning communities to develop and align instructional	0.216	0.173	0.093	0.052	**0.625**	-0.041	0.226
Teachers are encouraged to reflect on their own practice.	0.256	0.105	0.153	0.101	**0.618**	0.104	0.112

Follow-up is provided from professional development in this school.	0.233	0.124	0.16	0.075	**0.612**	0.267	0.082
What is the role teachers have in: Determining the content of in-service professional development programs	0.218	0.102	0.12	0.454	0.442	0.181	-0.107
The components of the teacher evaluation process accurately identify effectiveness.	0.183	0.164	0.057	0.13	0.099	**0.847**	0.059
The teacher evaluation process improves teachers' instructional strategies.	0.237	0.15	0.063	0.131	0.146	**0.829**	0.065
Teachers in this school receive informal feedback about their teaching on an ongoing basis.	0.359	0.111	0.135	0.005	0.377	0.42	0.049
What is the role teachers have in: School improvement planning	0.329	0.058	0.175	0.305	0.379	0.216	-0.076
This school has an effective approach (e.g., referral/identification process, scheduling, collaborative teaming, supplemental resources, accommodation practices) in place to meet the needs of students in special education.	0.197	0.116	0.129	0.112	0.123	0.073	**0.764**
This school has an effective approach (e.g., identification process, scheduling, collaborative teaming, instruction for language development) in place to meet the needs of English language learners.	0.103	0.061	0.148	0.074	0.155	0.048	**0.795**
Teachers are encouraged to try new things to improve instruction.	0.327	0.102	0.118	0.326	0.41	0.025	0.205

Component 7 was dropped from the scale for to three reasons: 1) two items in this

component did not fit within the construct of TBOSC, 2) this subscale has relatively low

reliability (α = .641), and 3) this component explained a small part of the variance (3.02%).

Component 5 (2 items) also had a low Cronbach's alpha (.638), however that component was

retained because the component's items clearly fit within the TBOSC construct definition that

describes teacher interactions with each other as relevant to developing teacher social capital in a

school.

The 20 item School Leadership scale loaded into two components. They were named 1)

Leaders Support Instruction, and 2) Leaders Address Concerns. Ten items loaded onto Leaders

Support Instruction ($\alpha = .907$), and 8 items loaded onto Leaders Address Concerns ($\alpha = .899$).

Two items were eliminated because they didn't load strongly onto either subscale. Leadership

subscale new names, items and reliability data are identified in Table 9.

Table 9

School Leadership Scale/Subscale EFA Results (including items by subscale and reliability coefficients)

School Leadership Subscale	Items	Cronbach Alpha
Component 1: Leadership Supports Instruction (10 items)	The school leadership communicates with the faculty adequately. The school leadership communicates clear expectations to students and parents. The school leadership consistently supports teachers. Teachers are held to high professional standards for delivering instruction. The school leadership facilitates using data to improve student learning. Administration consistently enforces rules for student conduct. The school leadership focuses on the professional growth of staff. Overall, the school leadership in my school is effective. The school leadership works to minimize disruptions for teachers, allowing teachers to focus on educating students. The faculty are recognized for accomplishments.	.907
Component 2: Leaders Address Teacher Concerns (8 items)	The school leadership makes a sustained effort to address teacher concerns about: Leadership issues. Facilities and resources. The use of time in my school. Professional development. Empowering teachers. Community engagement. Student learning.	.899

	New teacher support.	

Table 10 illustrates the factor loadings for the two School Leadership subscales: 1)

Leadership Supports Instruction, and 2) Leaders Address Teacher Concerns.

Table 10

School Leadership Factor Loading

Item	1. Leadership Supports Instruction	2. Leaders Address Teacher Concerns
The school leadership communicates with the faculty adequately.	**0.728**	0.357
The school leadership consistently supports teachers.	**0.725**	0.404
The school leadership communicates clear expectations to students and parents.	**0.705**	0.321
Administration consistently enforces rules for student conduct.	**0.68**	0.259
The school leadership facilitates using data to improve student learning.	**0.655**	0.218
Teachers are held to high professional standards for delivering instruction.	**0.651**	0.161
The school leadership focuses on the professional growth of staff.	**0.64**	0.4
Overall, the school leadership in my school is effective.	**0.623**	0.341
The school leadership works to minimize disruptions for teachers, allowing teachers to focus on educating students.	**0.606**	0.363
The faculty are recognized for accomplishments.	**0.604**	0.362
The school leadership makes a sustained effort to address teacher concerns about: The use of time in my school.	0.327	**0.751**
The school leadership makes a sustained effort to address teacher concerns about: Facilities and resources.	0.24	**0.748**
The school leadership makes a sustained effort to address teacher concerns about: Empowering teachers.	0.442	**0.713**
The school leadership makes a sustained effort to address teacher concerns about: Community engagement.	0.237	**0.712**
The school leadership makes a sustained effort to address teacher concerns about: Professional development.	0.348	**0.705**
The school leadership makes a sustained effort to address teacher concerns about: Leadership issues.	0.385	**0.695**
The school leadership makes a sustained effort to address teacher concerns about: student learning.	0.469	**0.628**
The school leadership makes a sustained effort to address teacher concerns about: New teacher support.	0.212	**0.589**
Teachers are assigned classes that maximize their likelihood of success with students.	0.314	0.332

School leadership participates in professional development opportunities with teachers.	0.412	0.192

Next in the analysis the scores from each subscale item were converted to z scores to standardize them to accommodate the range of variance and slightly and different response scales (some questions were on 2, some on 5, and some on 6 point scales). Z scores are useful to "normalize" the responses from different items that have different means and/or standard deviations (Hair, et al., 2010).

The z scores for the items in each subscale were then calculated into a factor score for each subscale. "Factor scores are the composite (latent) scores for each subject on each factor which is a grouping of variables (survey items) (Odom, 2011, p. 6). Calculating the factor scores for each subscale enables the researcher to examine the relationship of the subscales to each other in a correlation matrix.

Pearson's correlation coefficient matrix and an exploratory linear regression analysis were conducted to examine the relationship between the Precondition/Energizer (P/E), Teacher Bonding Social Capital (TBOSC) and School Leadership factor scales and to clearly answer the research questions. Regression analysis was also conducted to understand the relationship between these factors and school performance measures.

Findings

Correlation and exploratory linear regression analyses examined the relationship between the Precondition/Energizers (P/E), Teacher Bonding Social Capital (TBOSC) and School Leadership factor scales and school performance measures. A better understanding of these relationships will address the research questions: 1) What is the evidence of teacher social capital within teacher perceptions of their school working conditions; 2) What is the relationship

between teacher perceptions of school leaders and teacher social capital; and 3) What is the

relationship between teacher social capital and school academic performance?

Precondition/Energizers, Teacher Bonding Social Capital, School Leadership Relationships

This section addresses the research question: What is the evidence of teacher social

capital within teacher perceptions of their school working conditions? Three factor scales

Precondition/Energizers (P/E), Teacher Bonding Social Capital (TBOSC), and School

Leadership were compared using Pearson's correlation coefficient to analyze the strength of the

relationships (see Table 11 in Appendix 1 for correlation matrix of all factor scales). All

relationships were statistically significant. The correlations reviewed in this section represent the

strongest relationships. See Appendix 2 for a listing of all interactions.

1. TBOSC factor Teacher Leader Culture correlates strongly with:

    - P/E factor Teacher Expertise ($r^2 = .837$, p = .01)

    - Leadership factor Leaders Support Instruction ($r^2 = .848$, p = .01)

    - Leadership factor Leadership Addresses Teacher Concerns ($r^2 = .728$, p = .01)

2. TBOSC factor Effective Teaching Practice correlates strongly with:

    - P/E factor Professional Development for Instruction ($r^2 = .715$, p = .01)

3. Leadership factor Leaders Support Instruction correlates strongly with

    - P/E factor Teacher Expertise ($r^2 = .791$, p = .01)

    - Leadership factor Leaders Address Teacher Concerns ($r^2 = .771$, p = .01).

In summary, evidence of teacher social capital was found through the exploratory factor

analysis that resulted in the two scales Precondition/Energizers (4 factors) and Teacher Bonding

Social Capital (6 factors). The relationship between these two scales and the two School

Leadership factors indicates either strong or moderate relationships. The strongest relationships

exist between TBOSC Teacher Leader Culture and the P/E factor Teacher Expertise ($r^2 = .837$, p

= .01) and the School Leadership factor Leaders Support Instruction ($r^2 = .848$, p = .01).

Examples of these strong relationships are between Leaders Support Instruction scale and

all factors in the P/E (4) and TBOSC (6) scales, and between the School Leadership factor

Leaders Address Teacher Concerns and the P/E scale Parent and Community Support. When

schools develop a teacher leader culture that includes shared vision, trust and mutual respect, as

well as processes to raise issues, solve problems, and make sound decisions, teachers are

recognized as experts and take on leadership roles, influence decision making, and play

important roles in teaching and learning. All school leaders in these schools (e.g., teacher

leaders, principals, assistant principals, lead teachers, etc.) support instruction by holding

teachers to high professional standards, facilitating using data to improve student learning,

focusing on the right professional development for teachers, communicating effectively,

minimizing teacher disruptions, enforcing student conduct rules, and recognizing faculty for their

accomplishments.

The P/E factor Teacher Expertise had strong or moderate relationships with all P/E,

TBOSC and Leadership factor scales. TBOSC factor Effective Teaching Practice correlates

moderately with two P/E factors Professional Development for Instruction and Teacher Expertise

TBOSC factor Effective Teaching Practice correlates weakly with P/E factor Parent and

Community Support, P/E factor Time Supports and the TBOSC factor Teacher Role in

Instruction. Lastly, the P/E factor Time Supports had a significant, but weak and negative

relationship with all factors.

Perceptions of School Leadership and Teacher Social Capital

This section addresses the second and third research questions: 2) What is the

relationship between teacher perceptions of school leaders and teacher social capital; and 3)

What is the relationship between teacher social capital and school academic performance?

An exploratory linear regression analysis of the two Leadership factor scales

(independent variables, IV) and two Precondition/Energizers (P/E) factor scales of Professional

Development for Instruction and Teacher Expertise factors (dependent variable, DV) resulted in

moderately strong r^2 of .40 (p<.0001) with P/E scale Professional Development for Instruction

scale and strong r^2 of .64 (p<.0001) with Teacher Expertise scale. Weak relationships were found

between the two Leadership factor scales and the remaining two P/E subscales of Parent and

Community Support (r^2 = .175, p<.0001) and Time Supports (r^2 = .01, p<.0001). A stepwise

regression for elaboration identified that the School Leadership factor Leaders Support

Instruction is strongly related to P/E factor Teacher Expertise explaining 62% of the variance

(p<.0001) and is moderately related to P/E factor Professional Development for Instruction,

explaining 39% of variance (p<.0001).

Next an exploratory linear regression analysis of the two School Leadership factor scales

(IV) and two Teacher Bonding Social Capital (TBOSC) (DV) factors found that TBOSC factor

Teacher Leader Culture (DV) resulted in strong r^2 of .74 (p<.0001), and a moderately strong r^2 of

.40 (p<.0001) for Effective Teaching Practice. Weaker relationships with the four remaining

TBOSC factor scales and the Leadership factor scales resulted in r^2 of .31 (p<.0001) with

TBOSC factor Community and Parent Culture; r^2 of .25 (p<.0001) with TBOSC factor Effective

Use of Teacher Time; r^2 of .24 (p<.0001) with TBOSC factor Teacher Evaluation; and r^2 of .21 (p

<.0001) TBOSC factor Teacher Role in Instruction.

A stepwise regression for elaboration identified that the School Leadership factor scale Leaders Support Instruction is strongly related to TBOSC factor Teacher Leader Culture explaining 72% of the variance (p<.0001). School Leadership factor Leaders Support Instruction is moderately related to TBOSC factor Effective Teaching Practice explaining 38% of the variance (p<.0001), and a slightly weaker support of TBOSC factor Community and Parent Culture (r^2 of .38, p<.0001). Still weaker relationships with School Leadership factor Leaders Support Instruction resulted in r^2 of .24 (p<.0001) with TBOSC factor Effective Use of Teacher Time, r^2 of .23 (p<.0001) with TBOSC factor Teacher Evaluation, and r^2 of .19 (p<.0001) for TBOSC factor Teacher Role in Instruction.

A linear regression of the combined Leadership factor scales (IV) and the P/E factor scales (IV) resulted in a strong r^2 of .80 (p<.0001) with the TBOSC factor Teacher Leadership Culture and r^2 of .57 (p<.0001) with TBOSC factor Effective Teaching Practice. The combined School Leadership and P/E factor scales resulted in moderate r^2 of .42 (p<.0001) with TBOSC factor Community and Parent Culture as well as r^2 of .39 (p<.0001) TBOSC factor Teacher Role in Instruction. Weaker relationships are found between the r^2 of .34 (p<.0001) with TBOSC factor Effective Use of Teacher Time and r^2 of .28 with TBOSC factor Teacher Evaluation.

A stepwise regression for elaboration identified that the School Leadership factor scale Leaders Support Instruction is strongly related to TBOSC factor Teacher Leader Culture, explaining 72% of the variance (p<.0001) and when P/E factor scale Teacher Expertise is added 80% of the variance is explained.

A stepwise regression for elaboration identified that the P/E factor Professional Development for Instruction has a moderately strong relationship with TBOSC factor Effective

Teaching Practice, explaining 52% of the variance (p < .0001); however, no other factors added

strength to this model to support TBOSC factor Effective Teaching Practice.

A stepwise regression for elaboration identified that the Leadership factor scale Leaders

Support Instruction is weakly related to TBOSC factor Community and Parent Culture,

explaining 30% of the variance (p < .0001), however with the P/E factor Parent and Community

Support added the relationship is moderate explaining 40% of the variance (p < .0001).

A stepwise regression for elaboration identified that the P/E factor Teacher Expertise is

weakly related to TBOSC factor Effective Use of Teacher Time, explaining 27% of the variance

(p < .0001). When P/E factor Professional Development for Instruction is added the relationship

increases to explain 31% of the variance (p < .0001).

A stepwise regression for elaboration identified that the P/E factor scale Teacher

Expertise is moderately related to TBOSC factor Teacher Role in Instruction, explaining 38% of

the variance (p < .0001), however no other factors added strength to this model to support

Teacher Role in Instruction.

A stepwise regression for elaboration identified that the Leadership factor scales Leaders

Support Instruction is weakly related to TBOSC factor Teacher Evaluation, explaining 23% of

the variance, however no other factors added strength to this model to support Teacher

Evaluation.

In summary, School Leadership factor scales have a strong relationship to the TBOSC

factors Teacher Leader Culture and Effective Teaching Practice, specifically the Leadership

factor Leaders Support Instruction has a strong relationship with TBOSC factor Teacher Leader

Culture. School Leadership factor Leaders Support Instruction also has a moderately strong

relationship with TBOSC factor Effective Teaching Practice. The Leadership factors had weak

relationships with the remaining five TBOSC factor scales of Effective Use of Teacher Time,

Community Parent Culture, Teacher Role in Instruction, Effective Teaching Practice, and

Teacher Evaluation .

When School Leadership factors are combined with Precondition/Energizers their

strongest relationship are with TBOSC factors: 1) Teacher Leadership Culture, 2) Teacher

Evaluation, and 3) Community and Parent Culture. The School Leadership factor Leadership

Supports Instruction strongly supports TBOSC factor Teacher Leadership Culture and becomes

stronger with P/E scale Teacher Expertise and has a moderate relationship to TBOSC factor

Community and Parent Culture and becomes moderately strong when P/E Parent and

Community Support is added. The P/E factor scale of Professional Development for Instruction

moderately supports Effective Teaching Practice.

The relationships identified in this analysis supports that school leadership has a strong to

moderate relationship with the environmental conditions of Precondition/Energizers factors

Professional Development for Instruction and Teacher Expertise, and in particular the Leadership

factor Leaders Supports Instruction lends strength to this relationship. The practices that leaders

do to communicate effectively to teachers with clear expectations and expect high standards of

instruction develop the school conditions that support teachers with relevant and effective

professional development. This professional development specifically improves instruction by

refining teaching practices, deepens teachers content knowledge, enhances their ability to

implement instructional strategies to meet diverse student learning needs. In addition, leaders

also create the conditions that value teacher expertise by listening to their ideas and opinions,

empowering teachers to make decisions, providing formal leadership roles and supporting their

efforts to maintain discipline in their classrooms.

Leadership factors Leadership Addresses Teacher Concerns does not have a relationship with any of the Precondition/Energizers of a school environment that helps to develop teacher social capital. This Leadership factor consists of items that identify how school leaders make a sustained effort to address teacher concerns about leadership issues, facilities and resources, teacher time, professional development, empowering teachers, community engagement and student learning. It seems that if leaders focus on supporting important instructional areas for teachers such as communicating effectively, having clear expectations, having high expectations of instruction (e.g., using data to improve student learning) as well as effective professional development and enforcing student conduct rules then addressing teacher concerns is less needed due to leadership that supports instruction effectively.

Teacher Social Capital Relationship to School Academic Performance

To examine the relationship between teacher social capital and school performance an exploratory linear regression analysis of the Teacher Bonding Social Capital (IV) and the school performance outcome scores of academic achievement (DV) resulted in r^2 of .102 (p<.0001). Additional exploratory linear regression analyses were conducted with academic growth (r^2 of .054 (p<.0001) and academic growth gaps (r^2 of .040 (p<.0001). A stepwise regression for elaboration identified the TBOSC factor scale of Community and Parent Culture (IV) as the first contributing factor to academic achievement (DV) (r^2 of .072 (p<.0001), academic growth (DV) (r^2 of .047 (p<.0001) and academic growth gaps (DV) (r^2 of .035 (p<.0001). The second contributing factor was TBOSC factor scale of Teacher Role in Instruction (IV) to academic achievement (DV) (r^2 of .087 (p<.0001), academic growth (r^2 of .050 (p<.0001). Also contributing as a second factor was TBOSC factor scale Teacher Leaders Culture to academic growth gaps (r^2 of .038 (p<.0001).

An exploratory linear regression analysis of the Teacher Bonding Social Capital (IV) and

the Precondition/Energizer factor scales (IV) and the school performance outcome scores of

academic achievement (DV) resulted in r^2 of .18 (p<.0001). Additional exploratory linear

regression analyses were conducted with academic growth (r^2 of .10 (p<.0001) and academic

growth gaps (r^2 of .07X (p<.0001). A stepwise regression for elaboration identified the P/E

factor scale of Parent and Community Support (IV) as the first contributing factor to academic

achievement (DV) (r^2 of .137 (p<.0001), academic growth (DV) (r^2 of .092 (p<.0001) and

academic growth gaps (DV) (r^2 of .062 (p<.0001). Consistently the second contributing factor

was TBOSC factor scale of Community and Parent Culture (IV) to academic achievement (DV)

(r^2 of .147 (p<.0001), academic growth (r^2 of .098 (p<.0001) and academic growth gaps (r^2 of

.067 (p<.0001).

In summary, Teacher Bonding Social Capital explains 10% of the variance of school

academic achievement, but when coupled with the Precondition/Energizers these factors explain

18% of the variance of school academic achievement. Teacher Bonding Social Capital does not

contribute as strongly to academic growth or academic growth gaps. This finding identified that

Teacher Bonding Social Capital is an important factor for school and teacher leaders, as well as

principal supervisors to attend to impact student achievement. When the school environmental

conditions (Precondition/Energizers) are also attended to an almost doubling effect occurs to

impact student achievement.

Discussion

This research examined the relationship between teacher social capital, school leadership

and their impact on school performance. The findings show that in schools where there are

strong and trusting teacher relationships among colleagues, with school leadership, and with

parents and the community, improved student achievement results. This study used 2015 TELL

data as a source of teacher perceptions of working conditions, to determine if some of the teacher

working conditions the TELL survey examines could be a proxy for components of a system of

teacher social capital and if it could, then examine the relationship between teacher social capital

components, school leadership, and school performance. From this analysis school leaders,

teacher leaders, and principal supervisors can identify specific in-school factors that can lead to

concrete actions school and teacher leaders can take to develop teacher social capital in their

schools and improve school performance.

Of all the in-school components that contribute to improving school performance this

study found that Teacher Bonding Social Capital contributes 10% to existing in-school factors

that improve school performance. When Precondition/Energizer factors (e.g., teacher expertise,

professional development, time supports, parent and community instructional supports) are

combined with Teacher Bonding Social Capital practices an additional 8% contribution to school

performance results. Thus, the combined Precondition/Energizers and Teaching Bonding Social

Capital factors contribute 18% toward improving school performance. For school and teacher

leaders, paying attention to creating a school environment that develops teacher bonding social

capital can make an important difference to students.

One way that school leaders and teachers can energize, or create an environment, that

strengthens teacher social capital is by developing and supporting teacher leaders and a peer-to-

peer teacher network. Examples include structuring time for professional development that

provides for ongoing opportunities for teachers to work together to: 1) refine teaching practices,

2) meet diverse student learning needs, 3) increase their ability to improve student learning, and

4) develop teachers' knowledge and skills most needed to teach effectively. Opportunities to

reflect with each other is important to energizing the teacher social network as well. In addition,

if teachers are regarded as experts in their field, and are depended upon to make decisions about

educational issues such as teaching, scheduling, professional development and others, these

practices will contribute to a strong school environment that can develop teacher social capital.

School and teacher leadership that fosters an atmosphere of mutual respect, and teachers

as problem solvers also develops teacher social capital. These factors can be supported by school

norms that are used and respected. In addition, school environments where teachers are

comfortable raising issues and concerns important to them also develops teacher social capital.

When this finding is considered in light of the strong correlations found between the

TBOSC scale Teacher Leadership Culture and the P/E scale Teacher Expertise (r = .837, p =

.01), and the strong relationship finding from the regression analysis between the Leadership

scales and TBOSC factors Teacher Leader Culture and Effective Teaching Practice, school

leaders need to focus on developing a school atmosphere of trust, mutual respect, and shared

vision, and need to value teachers as experts by providing for professional development that

improves their instruction. In addition, school leaders that support instruction through effective

communication to faculty, students, and parent/guardians, supports teachers by minimizing

disruptions, and focuses on faculty professional growth rather than solely addressing specific

teacher concerns will create a school atmosphere that develops teacher bonding social capital.

In schools where a culture of teacher leadership exists, this culture is strongly supported

by teacher expertise (expert teachers make good teacher leaders) and school leaders.

Recognizing the experience teachers have by empowering them as decision makers, giving them

a voice into school decisions and creating teacher leadership roles as instructional coaches,

mentors and curriculum experts are ways to develop a strong teacher leadership culture. School

leaders that support instruction need to be effective communicators, use data to improve student

learning, hold teachers to high standards and recognize them are ways to develop a culture of

teacher leadership.

School leaders that support instruction contribute to the school environment

(Precondition/Energizers) through professional development that deepens teacher expertise,

improves instructional strategies to meet diverse student needs and gives teachers time to

implement their new knowledge into teaching practices will also develop teacher social capital.

Currently, the Colorado Department of Education through the New Teacher Center,

supports school interpretation of TELL data most often by examining the frequencies of

responses to TELL items. This research identifies a different way to use TELL data through the

lens of developing specific school leader practices that strengthen school conditions and help to

develop teacher bonding social capital. A module to extract items from TELL that indicate the

component scales of teacher social capital may be possible to examine school or district data to

determine if teacher social capital exists in a school or district. Further analysis of different

school level data will determine if this is possible using the TELL data.

Recommendations

School districts across the U.S. are exploring ways to expand and support a teacher

leadership culture in their schools while teachers and school leaders are adapting to embrace a

more distributed way of guiding and improving the instructional practices in a school. This study

identifies teacher leadership culture as an important teacher bonding social capital factor making

the connection that developing teacher social capital in a school can support improved school

performance. Of the 6 teacher bonding social capital factors that emerged from this study,

teacher leaders culture, teacher expertise, effective teaching practice and community and parent

communication are areas to focus on in developing strong teacher social capital. Carefully

crafting structures that build a school environment of shared vision, trust, respect, effective

decision making processes and cooperative problem solving lends strength to developing teacher

leadership and strong bonding.

Leaders must also pay attention to the factors that create the conditions by which teacher

social capital may flourish. Leaders who foster relevant and effective teacher professional

development, engage teachers in instructional decisions, support teachers instructionally and

empower them in instruction, develop strong and supportive school environments in which

teachers thrive, students learn, and schools attain higher performance standards. When school

and teacher leaders acknowledge and develop teacher expertise and cultivate meaningful and

practical professional development that specifically supports instruction, a school's most

important customer, the student, can benefit greatly.

TELL data has the potential to yield more than frequency results of how teachers in a

school perceive their working conditions. TELL data, at the district level, may assist in

ascertaining the strength of teacher social capital in a district and in some schools as well as the

strength of the relationship between school leadership in developing the environmental

conditions that support teacher social capital. Nurturing healthy, professional, and relevant

relationships among teachers in a school can foster leadership and resource sharing that benefits

teachers, students and the community as schools may yield better achievement because of the

capital developed.

References

Adler, P. S., and Kwon, S. (2002). Social capital: Prospects for a new concept. *Academy of Management Review, 2002(27)*, 17-40.

Balkundi, P., & Kilduff, M. (2005). The ties that lead: A social network approach to leadership. *The Leadership Quarterly, 16*(6), 941-961. doi:10.1016/j.leaqua.2005.09.004

Bourdieu, P. (1986). The forms of capital. In J. Richardson (Ed.), *Handbook of theory and research for the sociology of education, ed.* (R. Nice Trans.). (pp. 241-257). New York: Greenwood.

Bridwell-Mitchell, E. N., & Cooc, N. (2016). The ties that bind: How social capital is forged and forfeited in teacher communities. *Educational Researcher, 45*(1), 7-17.

Bryk, A. S., and Schneider, B. (2002). *Trust in schools: A core resource for improvement*. New York, NY: Russell Sage Foundation.

Carbonaro, W. (2004). Parent, peer, and teacher influences on student effort and academic outcomes. *ASA National Conference, San Francisco, CA,*

Colorado Department of Education. (August 2014). Unified improvement planning handbook. Retrieved from https://www.cde.state.co.us/uip/20142015uiphandbook

Colorado Department of Education. (2015). Unified Improvement Planning Resources. Retrieved from https://www.cde.state.co.us/uip/uip_trainingandsupport_resources.

Colorado Department of Education. (2016). About CSAP/TCAP. Retrieved from https://www.cde.state.co.us/assessment/coassess-about.

Coleman, J., and Hoffer, T. (1987). *Public and private high schools: The impact of communities.* New York, NY: Basic Books.

Coleman, J. S. (1988). Social capital in the creation of human capital. American Journal of

Sociology, 94(, Supplement: Organizations and Institutions: Sociological and Economic

Approaches to the Analysis of Social Structure), S95-S120.

Croninger, R. B., and Lee, V. E. (2001). Social capital and dropping out of high school: Benefits

to at-risk students of teachers' support and guidance. *Teachers College Record, 103(4)*,

548-541.

Darling-Hammond, L., Meyerson, D., LaPointe, M., and Orr, M. T. (2007). Preparing school

leaders for a changing world: Lessons from exemplary leadership development programs,

school leadership study final report. Palo Alto, CA: Stanford Educational Leadership

Institute.

Deal, T. E., Purinton, T., & Waetjen, D. C. (2009). *Making sense of social networks in schools*.

Thousand Oaks, CA: Corwin Press.

Dika, S. L., and Singh, K. (2002). Applications of social capital in education literature: A critical

analysis. *Review of Educational Research, (72)1*, 31-60.

Drago-Severson, E., & Blum-DeStefano, J. (2014). Leadership for transformational learning: A

developmental approach to supporting leaders' thinking and practice. *Journal of

Research on Leadership Education, 9*(2), 113-141.

DuFour, R., Eaker, R., and DuFour, R. (2005). Recurring themes of professional learning

communities and the assumptions they challenge. In R. DuFour, R. Eaker, and R.

DuFour (Eds.), *On common ground* (pp. 7-30). Bloomington, IN: Solution Tree.

Frankfort-Nachmias, C., and Leon-Guerrero, A. (2011). Social statistics for a diverse society,

6th ed. Thousand Oaks, CA: Pine Forge Press.

Garcia-Reid, P. (2007). Examining social capital as a mechanism for improving school

      engagement among low income Hispanic girls. *Youth & Society, 39*(2), 164-181.

Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2010). *Multivariate data analysis* (7th

      ed.). Upper Saddle River, NJ: Prentice Hall.

Hallinger, P., & Heck, R. H. (1998). Exploring the principal's contribution to school

      effectiveness: 1980-1995. *School Effectiveness and School Improvement, 9*(2), 157-191.

Hallinger, P., and Heck, R. H. (2010), Collaborative leadership and school improvement:

      Understanding the impact on school capacity and student learning. *School leadership and*

      management. 30(2). 95-110.

Hirsch, E., (2009). Understanding the results of the TELL Colorado educator's survey: Initial

      findings. www.TELLColorado.org.

Hirsch, E., Sioberg, A. & Germuth, A. (2010). TELL Colorado: Creating supportive school

      environments to enhance teacher effectiveness. Santa Cruz, CA: New Teacher Center.

Irving, F. (1896). What is capital? *The Economic Journal. 6(24)*. 509-534.

Leana, C. R., & Pil, F. K. (2006). Social capital and organizational performance: Evidence from

      urban public schools. *Organization Science, 17*(3), 353-366. doi:10.1287/orsc.1060.0191

Leithwood, K., Louis, K. S., Anderson, S., & Wahlstrom, K. (2004). *How leadership influences*

      student learning. ().Wallace Foundation.

Leithwood, K. A., Aitken, R., & Jantzi, D. (2001). *Making schools smarter: A system for*

      monitoring school and district progress (2nd ed.). Thousand Oaks, CA: Corwin Press.

Leithwood, K., & Sun (2012). The nature and effects of transformational school leadership: A

      meta analytic review of unpublished research. *Education Administration Quarterly.*

      48(3). 387-423.

Lin, N. (2001). *Social capital: A theory of social structure and action*. Cambridge, UK; New

York: Cambridge University Press.

Levin, J. A., & Datnow, A. (2012). The principal role in data driven decision making: Using case

study data to develop multi-mediator models of educational reform. *School Effectiveness

and School Improvement: An International Journal of Research, Policy and Practice.

23(2).* 179-201.

Louis, K. S., Leithwood, K. A., Wahlstrom, K. L., & Anderson, S. E. (2010). *Investigating the

links to improved student learning: Final report of research findings.* (). St. Paul, MN:

Center for Applied Research and Educational Improvement, University of Minnesota.

Louis, K. S., Mayrowetz, D., Murphy, J., & Smylie, M. (2013). Making sense of distributed

leadership: How secondary school educators look at job redesign. *International Journal

of Educational Leadership and Management, 1*(1), 33-68.

Marzano, R. J., Waters, T., & McNulty, B. A. (2005). *School leadership that works: From

research to results*. Alexandria: Association for Supervision & Curriculum Development.

Meire, A. (1999). Social capital and achievement among adolescents. Paper presented at the

American Sociological Association Annual Meeting, Chicago, IL.

Minckler, C. H. (2011). *Teacher social capital: The development of a conceptual model and

measurement framework with application to educational leadership and teacher efficacy*

(Doctoral dissertation). Retrieved from Proquest Dissertations Publishing. (3489646)

Moolenaar, N. M., Daly, A. J., & Sleegers, P. J. C. (2010). Occupying the principal position:

Examining relationships between transformational leadership, social network position,

and schools' innovative climate. *Educational Administration Quarterly, 46*(5), 623-670.

Moolenaar, N. M., Sleegers, P. J. C., & Daly, A. J. (2012). Teaming up: Linking collaboration

networks, collective efficacy, and student achievement. *Teaching and Teacher*

Education, 28(2), 251-262.

Molinari, N. M., and Sleegers, P. J. C. (2015). The networked principal: Examining principal's

social relationships and transformational leadership in school and district networks.

Journal of Educational Administration. 53(1). 8-39.

Murphy, J., Eliott, S. N., Goldring, E., and Porter, A. C. (2006). Learning-centered leadership: A

conceptual foundation. Nashville, TN. Learning Sciences Institute, Vanderbilt University.

Retrieved from http://files.eric.ed.gov/fulltext/ED505798.pdf.

New Teacher Center. (2015). TELL Colorado. Santa Cruz, CA: The New Teacher Center.

Retrieved from http://www.tellcolorado.org

New Teacher Center. (2013). 2013 Colorado TELL survey: Validity and reliability report. Santa

Cruz, CA: The New Teacher Center. Retrieved from

https://tellcolorado.org/uploads/File/CO13_brief_val_rel.pdf

Penuel, W., Riel, M., Krause, A., & Frank, K. (2009). Analyzing teachers' professional

interactions in a school as social capital: A social network approach. *Teachers College*

Record, 111(1), 124.

Putnam, R. D. (1995). Bowling alone: America's declining social capital. *Journal of Democracy,*

6(1), 65-78. doi:10.1353/jod.1995.0002

Putnam, R. D. (2000). *Bowling alone: The collapse and revival of American community*. New

York: Simon & Schuster.

Schunk, D. H. (2012). *Learning theories: An educational perspective*. Boston, MA: Pearson

Education, Inc.

Scott, W. G. (1961). Organization theory: An overview and an appraisal. *The Journal of the*

    Academy of Management (Pre-1986), 4(1), 7

Spillane, J. P., and Kim, C. M. (2012). An exploratory analysis of formal school leaders'

    positioning in instructional advice and information networks in elementary schools.

    American Journal of Education. 119(1). 73-102.

Uekawa, K., Aladjem, D., & Zhang, Y. (2006). The impact of comprehensive school reform on

    teachers' social capital and students' achievement. *Annual Meeting of the American*

    Sociological Association,

Wallace Foundation. (2013). *The school principal as leader: Guiding schools to better teaching*

    and learning. (). New York: Wallace Foundation.

Yukl, G., Gordon, A., & Taber, T. (2002). A hierarchical taxonomy of leadership behavior:

    Integrating a half century of behavior research. *Journal of Leadership and*

    Organizational Studies, 9(1), 15-32. doi:10.1177/107179190200900102

Zepeda, S. J. (2013). *The principal as instructional leader: A practical handbook* (3rd ed.).

    Larchmont, NY: Eye on Education.

APPENDIX A

Table 11. Correlation Matrix of Precondition/Energizers, Teacher Bonding Social Capital and School Leadership

	Professional Development for Instruction (P/E)	Teacher Expertise (P/E)	Parent and Community Support (P/E)	Time Supports (P/E)	Teacher Leadership Culture (TBOSC)	Effective Use of Teacher Time (TBOSC)	Community and Parent Culture (TBOSC)	Teacher Role in Instruction (TBOSC)	Effective Teaching Practice (TBOSC)	Teacher Evaluation (TBOSC)	Leaders Support Instruction (Lead)	Leaders Address Teacher Concerns (Lead)
Professional Development For Instruction (P/E)												
Teacher Expertise (P/E)	.625**											
Parent and Community Support (P/E)	.342**	.459**										
Time Supports (P/E)	-.097**	-.083**	-.032**									
Teacher Leadership Culture (TBOSC)	.592**	.837**	.419**	-.086**								
Effective Use of Teacher Time (TBOSC)	.480**	.519**	.317**	-.203**	.490**							
Community and Parent Culture (TBOSC)	.389**	.503**	.520**	-0.002	.524**	.304**						
Teacher Role in Instruction (TBOSC)	.358**	.609**	.300**	-.046**	.500**	.385**	.305**					
Effective Teaching Practice (TBOSC)	.715**	.557**	.303**	-.065**	.575**	.405**	.415**	.356**				
Teacher Evaluation (TBOSC)	.445**	.455**	.252**	-.101**	.454**	.357**	.244**	.316**	.381**			
Leaders Support Instruction (Lead)	.620**	.791**	.412**	-.077**	.848**	.486**	.544**	.437**	.614**	.477**		
Leaders Address Teacher Concerns (Lead)	.564**	.679**	.368**	-.080**	.728**	.447**	.497**	.431**	.562**	.433**	.771**	

APPENDIX B

Moderate to Weak Correlations between Precondition/Energizers, Teacher Bonding Social Capital and School Leadership factor scales.

1. TBOSC factor scale Teacher Leader Culture correlates moderately with:

    - P/E factor Professional Development for Instruction ($r^2 = .592$, p = .01)

    - P/E factor Parent and Community Support ($r^2 = .419$, p = .01)

    - TBOSC factor Effective Teaching Practice ($r^2 = .575$, p = .01)

    - TBOSC factor Community and Parent Culture ($r^2 = .524$, p = .01)

    - TBOSC factor Teacher Role in Instruction ($r^2 = .500$, p = .01)

    - TBOSC factor Effective Use of Teacher Time ($r^2 = .490$, p = .01)

    - TBOSC factor Teacher Evaluation ($r^2 = .454$, p = .01)

2. TBOSC factor scale Effective Teaching Practice correlates moderately with

    - TBOSC factor Effective Use of Teacher Time ($r^2 = .405$, p = .01)

    - TBOSC factor Community and Parent Culture ($r^2 = .415$, p = .01)

    - Leadership factor Leaders Support Instruction ($r^2 = .614$, p = .01)

    - Leadership factor Leaders Address Teacher Concerns ($r^2 = .562$, p = .01)

3. P/E factor scale Teacher Expertise correlates moderately with:

    - P/E factor scale Professional Development for Instruction ($r^2 = .625$, p = .01)

    - TBOSC factor of Teacher Role in Instruction ($r^2 = .609$, p = .01)

    - TBOSC factor Effective Teaching Practice ($r^2 = .557$, p = .01)

    - TBOSC factor Effective Use of Teacher Time ($r^2 = .519$, p = .01)

    - TBOSC factor Community and Parent Culture ($r^2 = .503$, p = .01)

    - TBOSC factor Teacher Evaluation ($r^2 = .444$, p = .01)

- Leadership factor Address Teacher Concerns ($r^2 = .679$, p = .01).

4. P/E factor scale Professional Development for Instruction correlates moderately with

   - TBOSC factor Effective Use of Teacher Time ($r^2 = .480$, p = .01)

   - TBOSC factor Teacher Evaluation ($r^2 = .445$, p = .01)

   - Leadership factor Leaders Address Teacher Concerns ($r^2 = .564$, p = .01)

5. Leaders Support Instruction correlates moderately with:

   - P/E factor Professional Development for Instruction ($r^2 = .620$, p = .01)

   - P/E factor Parent and Community Support ($r^2 = .412$, p = .01)

   - TBOSC factor Community and Parent Culture ($r^2 = .544$, p = .01)

   - TBOSC factor Effective Use of Teacher Time ($r^2 = .486$, p = .01)

   - TBOSC factor Teacher Evaluation ($r^2 = .477$, p = .01),

   - TBOSC factor Teacher Role in Instruction ($r^2 = .437$, p = .01)

6. Leadership factor scale Leaders Address Teacher Concerns correlates moderately with

   - TBOSC factor Community and Parent Culture ($r^2 = .497$, p = .01)

   - TBOSC factor Effective Use of Teacher Time ($r^2 = .447$, p = .01)

   - TBOSC factor Teacher Evaluation ($r^2 = .433$, p = .01)

   - TBOSC factor Teacher Role in Instruction ($r^2 = .431$, p = .01)

7. TBOSC factor scale Community and Parent Culture correlates moderately with

   - P/E factor Parent and Community Support ($r^2 = .520$, p = .01)

8. P/E factor Time Supports reported significant, but weak and negative relationship with all

   factor scales.