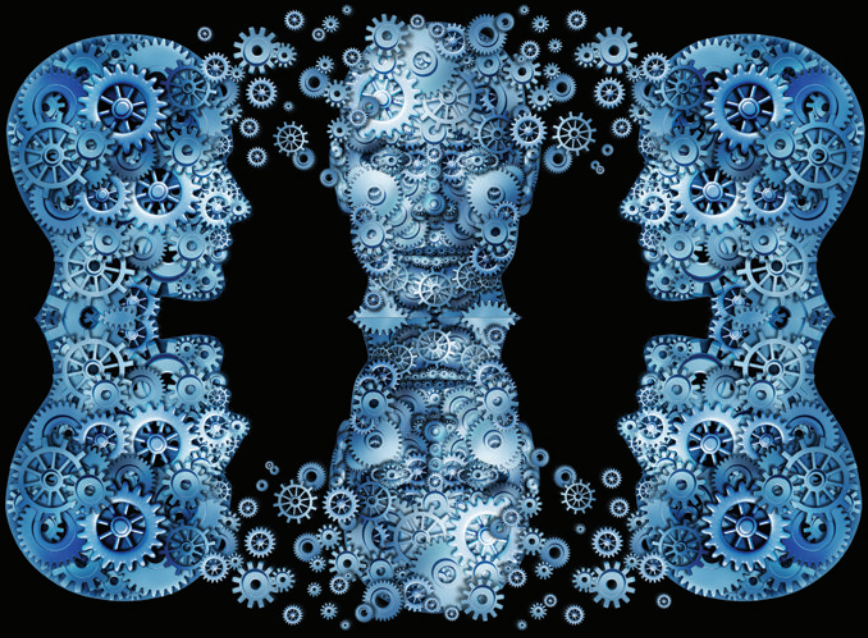
LEADERSHIP and SCHOOL QUALITY



edited by
Michael F. DiPaola &
Wayne K. Hoy

A VOLUME IN
RESEARCH AND THEORY IN EDUCATIONAL ADMINISTRATION

Leadership and School Quality

A Volume in
Research and Theory in Educational Administration

Series Editors
Michael F. DiPaola, *The College of William and Mary*
Wayne K. Hoy, *Ohio State University*

Research and Theory in Educational Administration

Wayne K. Hoy, Michael F. DiPaola,
Cecil Miskel, and Patrick B. Forsyth,, Series Editors

Leadership and School Quality (2015)
edited by Michael F. DiPaola and Wayne K. Hoy

Contemporary Challenges Confronting School Leaders (2012)
edited by Michael DiPaola and Patrick B. Forsyth

Leading Research in Educational Administration: A Festschrift for Wayne K. Hoy (2011)
edited by Michael DiPaola and Patrick B. Forsyth

Analyzing School Contexts: Influences of Principals and Teachers in the Service of Students (2010)
edited by Wayne K. Hoy and Michael F. DiPaola

Studies in School Improvement (2009)
edited by Wayne K. Hoy and Michael F. DiPaola

Improving Schools: Studies in Leadership and Culture (2008)
edited Wayne K. Hoy and Michael F. DiPaola

Essential Ideas For The Reform of American Schools (2007)
edited by Wayne K. Hoy and Michael F. DiPaola

Contemporary Issues in Educational Policy and School Outcomes (2006)
edited by Wayne K. Hoy and Cecil Miskel

Educational Leadership and Reform (2006)
edited by Wayne K. Hoy and Cecil Miskel

Educational Administration, Policy, and Reform: Research and Measurement (2004)
edited by Wayne K. Hoy and Cecil Miskel

Studies in Leading and Organizing Schools (2003)
edited by Cecil Miskel and Wayne K. Hoy

Theory and Research in Educational Administration Vol. 1 (2002)
edited by Cecil Miskel and Wayne K. Hoy

Leadership and School Quality

edited by

Michael F. DiPaola
The College of William and Mary

and

Wayne K. Hoy
The Ohio State University

INFORMATION AGE PUBLISHING, INC.
Charlotte, NC • www.infoagepub.com

Library of Congress Cataloging-in-Publication Data

IP record for this book is available from the Library of Congress
http://www.loc.gov

ISBN: 978-1-68123-038-2 (Paperback)
978-1-68123-039-9 (Hardcover)
978-1-68123-040-5 (ebook)

Printed in the United States of America

CONTENTS

PREFACE

Michael F. DiPaola and Wayne K. Hoy

Leadership and School Quality is the12th volume in this series on Research and Theory in Educational Administration. As the title suggests, the chapters are organized around two critical aspects of school administration—leadership and quality.

The first chapter is a general analysis of thinking, deciding, and leading. Wayne Hoy argues that thinking is the precursor to reflective deciding, and both thinking and deciding are critical features of leading. Unfortunately, leading has become a celebrity term as well as a cliché, both of which distract from the competence, creativity, and the hard work of the task of leadership. At the heart of leading is the struggle to solve the fundamental dilemmas of organizations, complex tasks that require differentiated approaches.

The objective of this inquiry is to examine the theoretical and research bases for the critical organizational processes of thinking, deciding, and leading with the goal of synthesizing the literature into a coherent platform for effective administrative practice. Hoy develops a triarchic model of interactions among thinking, deciding, and leading and proposes seven principles as guides for practicing administrators. Concurrent thinking, choice architecture, satisficing, and the control of automatic, fast thinking are key elements in successful leadership.

Leadership and School Quality, pp. vii–xii

In Chapter 2, Leslie Grant is concerned with assessment of teaching and learning: She contends that leadership assessment is an important responsibility for leaders at all levels in the educational system. The term "leadership assessment" is a relatively new one that serves as a complement to instructional and curriculum leadership, thus providing the three basic leadership roles of school administrators.

After reviewing the emergence of standards related to assessment leadership as well as the preparation and competence of school leaders in assessment, Grant develops a systems approach to assessment leadership. She calls attention to the need for a nested approach to leadership assessment, that is, a coordinated and systemic perspective on leadership at all school levels. Leaders at the school and district levels need to be on the same page with their instructional, curriculum, and assessment initiatives. Grant sketches a nested system of leadership as she examines the kind of leadership needed at each level. Finally, she makes a strong case for a leadership model grounded in the tenets of systems thinking.

In Chapter 3, David Dixon provides an empirical study of schools that examines the relationships between servant leadership, organizational citizenship, and school climate. After appraising the historical underpinnings of each of these concepts, Dixon's research demonstrates consistent positive relations among servant leadership, organizational citizenship, and open and healthy school climate. Servant leadership is behavior that nurtures individual social and emotional development in organizations; it is grounded in compassion, collaboration, systems thinking, and moral authority.

Although Dixon's research clearly establishes important and substantial links between servant leadership, organizational citizenship, and organizational climate, the causal pattern of these relationships is unclear. Dixon predicted that servant leadership would have a stronger relationship with organizational climate than organizational citizenship, but that was not the case. Moreover, socioeconomic status of the school plays a strong role in the relationships; the wealthier the school, the greater the degree of academic and environmental press and the greater the degree of organizational citizenship. Clearly, servant leadership and organizational citizenship are important aspects of open and healthy school climate, but the relationships are complex and need further study to explain the interactions and causal patterns of these variables.

In Chapter 4, Ross Larson and his colleagues also provide an empirical study of principal leadership, which explores leadership effects on teacher quality and mathematics achievement. The researchers examine the presence of direct and indirect effects among principal leadership, teacher quality, and student achievement in two conditions: one in which teachers and principals were receiving training in a school-based social and

emotional learning (SEL) intervention, the *Responsive Classroom* approach, and the other in which principals and teachers were using "business as usual" approaches.

This experimental study revealed that a *Responsive Classroom* approach creates conditions in which principal leadership appears to influence positively teaching quality, and, in turn, mathematics achievement. The authors theorize that a *Responsive Classroom* enhances interconnectedness among principals, teachers, and students and enables positive influences of principal leadership.

In Chapter 5, based on the instructional strategies of Hattie (2009), Kristie and Charles Wagner, explore the influence of instructional leadership behavior. Their study examined the School University Research Network (SURN), a partnership between the College of William and Mary's School of Education and 28 K–12 school divisions. The SURN Principal Academy was designed to build principals' knowledge of Hattie's high-yield instructional strategies; to increase principal expertise with tools intended to collect evidence of classroom teaching and immediate feedback; and to facilitate collaborative observations to help teacher engage in reflective professional development to improve classroom performance.

The data show that the rates of instructional observations rose among participating principals in the SURN Principal Academy. Moreover, teachers who reported higher frequencies of instructional interactions with their principals also reported a greater degree of instructional change. Teachers' perceptions of principal support were positively correlated with instructional change, as were perceptions of principal support for instruction and frequency of principal interactions. Finally, teachers led by principals in the Academy reported that feedback, support, modeling, and engagement behaviors of their principals positively influenced their instruction.

In some contrast to the earlier research studies of leadership of this book, Chapter 6 describes the importance of support for school leaders. Thomas Beatty maps a principals' support network in an urban school district. In his qualitative study, Beatty investigated how networking promotes experienced principals' professional growth as well as the benefits of peer dialogue. The participants—identified through purposeful selection—were nine practicing middle school principals from an urban school division in Virginia. Their experience in the job ranged from 3 to 9 years.

Beatty reports that all of the principals in the study described their jobs as fascinating and fulfilling. Moreover, most principals recounted that working with students, teachers, and parents was the most rewarding aspect of their jobs. Their roles, however, were not without challenges; in fact, the majority stated that they often felt alone and isolated, and they stressed the importance of interactions with professional peers. Strikingly, all nine of these principals emphasized the salience of trust in enabling them to

communicate authentically with their peers. Support was also of critical importance to principals; they all expressed a desire to interact with and learn from leaders who shared a common appreciation for collaboration and joint learning. In brief, the study demonstrated the significance of support networks for principals as they engage the challenges of their job. Such networks reduce their sense of isolation and enhance their professional learning. Beatty provides a series of rich narratives to illustrate these conclusions.

Chapter 7 continues the theme of support, but from school leaders to teachers. Mary Lynne Derrington and Davis Lomascolo explored the relationship between teachers' perceptions of principal support and student achievement in reading and math in a sample of Tennessee elementary, middle, and high schools. Their study also tested the reliability and factor structure of the Principal Support Scale (PSS), a 16-item survey that was reported to be a valid and reliable measure of perceived principal support for teachers (DiPaola, 2012).

The analyses of their data revealed two strong factors of support, *instrumental* and *expressive*, which are consistent with the development of the PSS and previous study (DiPaola, 2012). Derrington and Lomascolo also found a significant positive relationship between principal support and mathematics achievement in their sample of teachers across the three school levels—previous studies on the positive relationship between principal support of teachers and student achievement (Andrews & Soder, 1987; DiPaola, 2012; O'Donnell & Whyte, 2005) were conducted only at high schools. Their study extends the prior research on principal support for teachers into K–8 schools and examines the relationship between the support principals provide to teachers and achievement of students.

In Chapter 8 we segue into studies that focus on school effectiveness. Lauren Bailes studied the relationships of four organizational factors—mindfulness, organizational citizenship behavior, organizational justice, teacher professionalism—to overall school effectiveness, as well as their collective impact on effectiveness, as measure by the School Effectiveness Index (Hoy & Ferguson, 1985). In order to develop a predictive model of school effectiveness she employed a series of regression analyses using data from her sample of 86 public elementary schools.

Bailes' analyses revealed that the four, predictor variables had a positive and significant relationship to overall effectiveness (adjusted $R^2 = .694$). However, only organizational citizenship made a positive, significant, and unique contribution to effectiveness ($\beta = .667$). As a result of her findings She argued that the more effort that teachers put into their work, beyond that which is contractually required or for which they are paid, the more effective the organization will become. She urged school leaders and teachers to shape practice and professional development so that as schools

grow in professionalism and citizenship, they are also progressing toward broader goals of organizational effectiveness.

In Chapter 9, Roxanne Mitchell and her colleagues report on a meta-analytic review they conducted to explore both the antecedents and the consequences of perceived school effectiveness. Their meta-analysis included published studies on school effectiveness that have used the index of perceived organizational effectiveness (IPOE) and its theoretical framework.

Mitchell and her team used comprehensive meta-analysis software to perform metacorrelation computations. Both fixed effects models (FEM) and mixed effects models (MEM) or random effect models (REM) were used. The researchers identified five categories of factors related to school effectiveness were: leadership, teacher characteristics, organizational features, community influence, and contextual variables. Teacher characteristics such as trust, efficacy, and collegiality had the strongest relationship with effectiveness. Additionally, there was a significant relationship between perceptions of effectiveness and student achievement in the studies analyzed.

One teacher characteristic identified as having a strong relationship with effectiveness, teacher trust, is the focus of Chapter 10. Dimitri Van Maele, Nienke Moolenaar, and Alan Daly report on their study that examined the ways in which direct relations with peers may influence teachers' perception of trust. Data from 645 educators in 37 Dutch elementary schools were analyzed using social network and multilevel analyses to determine social influences on teacher trust.

Van Maele, Moolenaar, and Daly found that both structural network characteristics (i.e., number of relationships as mentioned by the teacher) as well as relational network characteristics (i.e., level of peer trust) are significantly related to teachers' perceptions of trust in colleagues, above and beyond the influence of faculty level trust. As a result they conclude that (1) when teachers are surrounded by peers who trust their colleagues, they are more likely to trust their colleagues; (2) the more colleagues a teacher seeks out to discuss work, the more a teacher trusts his/her colleagues, and (3) the level of faculty trust positively influences individual trust in colleagues above and beyond the influence of peer trust.

In Chapter 11, W. Sean Kearney and Julie Gray report on their study of the impact teachers' trust in their clients (students and parents) and classroom friction on mathematics achievement of students. They argued that it is vital to identify classroom climate factors that positively affect student achievement. Kearney and Gray assessed the perceptions of 482 students and their teachers in their sample of 26 math classrooms from ten elementary schools. They calculated intraclass correlations to identify the level of variation in math achievement between classrooms, then employed

a random coefficient HLM model to identify the specific impacts that classroom friction and teacher trust in students and parents (clients) have on elementary math achievement.

Kearney and Gray found that both teacher trust in clients and classroom friction make statistically significant impacts on the variance in math achievement. They concluded that increased teacher trust and reduced levels of classroom friction may be one tool that principals and teachers can utilize to increase achievement in elementary math classrooms.

In our final chapter, Andrew Saultz explores the impact of the federal Race to the Top Program on state and district policy. Race to the Top Program established a state grant program to encourage educational reform and improve school quality. Saultz examined the changing nature of educational policy and how state and district policymakers responded to Race to the Top. He analyzed documents and conducted interviews with a broad range of decision makers at the state and district levels.

Saultz found that the majority of states altered policy surrounding teacher evaluations, caps on charter schools, and Core Content State Standards. The Race to the Top Program leveraged a small amount of money and a short policy window to shift policy areas that are historically very contentious. He also concluded that two things are not clear: (1) will any of these policy shifts actually improve educational quality; (2) will these policies have staying power in states that did not receive funds. With previous reforms, the federal government was able to mandate certain practices due to annual resource allocations. Most states will never see any additional funds from Race to the Top. If policies were passed in a response to gain revenue, some states may roll back the policies now that funds are no longer available.

This book series Theory and Research in Educational Administration is about understanding schools. We welcome articles and analyses that explain school organizations and administration. We are interested in the "why" questions about schools. To that end, case analyses, surveys, large data base analyses, experimental studies, and theoretical analyses are all welcome. We provide the space for authors to do comprehensive analyses where that is appropriate and useful. We believe that the Theory and Research in Educational Administration Series has the potential to make an important contribution to our field, but we will be successful only if our colleagues continue to join us in this mission. So join with us—let us hear from you if you have theory and research that will enlighten our understanding of schools.

ACKNOWLEDGMENTS

Sincerest thanks our colleagues who have contributed to this and previous volumes in this series. They inspire us and continue to add to our knowledge of school organizations. We would be remiss not to also thank both Diana Theisinger and Jingzhu Zhang for their assistance and suggestions. Their attention to detail was invaluable as we compiled this volume.

Michael F. DiPaola, College of William and Mary (Email: mfdipa@wm.edu)
Wayne K. Hoy, The Ohio State University (Email: whoy@mac.com)

December 2014

Leadership and School Quality, pp. xiii–xiii

CHAPTER 1

THINKING, DECIDING, AND LEADING

Sound Theory and Reflective Practice

Wayne K. Hoy

ABSTRACT

The purpose of this analysis was to examine extant theory and research on thinking, deciding, and leading, with the goal of synthesizing this literature into a coherent platform for effective administrative practice. The analysis focused on contemporary theory in social psychology, decision making, and "dilemma-based" leadership. A triarchic model of interactions among thinking, deciding, and leading was developed and seven principles were proposed as guides for practicing administrators. Concurrent thinking, choice architecture, satisficing, and the control of automatic, fast thinking are key elements in successful leadership.

This inquiry examines the interrelated concepts of thinking, deciding, and leading. Thinking is the precursor to reflective deciding, and both thinking and deciding are critical features of leading. The focus of this analysis is on

Leadership and School Quality, pp. 1–19

the theoretical groundings of each of the three concepts and the practical implications of their interactions for educational leaders.

THINKING

Contemporary explanations of the mind typically focus on dual-processing theories that describe two modes or systems of thinking. One mode operates fast and automatically and is an experiential system. The other is a more deliberate, rational, and analytic system (Kahneman, 2011; Stanovich & West, 2000). What is sound intuitive thinking? Are heuristics useful thinking tools? How can we harness modes of thinking into a positive force? These are the kinds of questions that will be considered in the first part of this analysis.

Fast and Slow Thinking

In his insightful and enlightening analysis of thinking, Daniel Kahneman (2011) examined two systems of the mind that determine how we think. In this dual-processing model of the mind, he developed and amplified what he called System 1 and System 2 thinking (Kahneman, 2011).

System 1 is the automatic, fast system. It operates quickly and effortlessly. A child darts into the roadway in front of our car; we slam on the brakes. The reaction is instantaneous, with little effort, and without any sense of voluntary control. Decisions in this system are fast and automatic.

System 2 is the effortful system. It operates deliberately by allocating effort to deal with complex problems. System 2 functions slowly, consciously, and carefully. It demands analysis, concentration, mental effort, and exertion. This is the system for careful, rational deliberation as well as complex computations. Multiplying 857 by 934 or checking the validity of an abstruse mathematical proof requires System 2 thinking. Decisions in this system are slow, orderly, effortful, and deliberate.

To be effective in everyday life, we need our thinking to engage both systems. A major function of slow, deliberate thinking is to hold in check the quick and rash impulses, the dubious biases,and the freewheeling nature of our automatic, fast thinking. But slowing down our automatic system to engage in more reflective thinking is a difficult task at best. Although most of us identify ourselves as conscious, deliberate thinkers who have sound beliefs, make careful choices, and decide what to think and how to act, the automatic system of thinking is harder to control than we believe. We all have a little voice whispering in our ear, "Slow down. You're going too fast. You're going to screw up," but this good advice usually goes unheeded.

Consider two classic examples (Frederick, 2005; Kahneman, 2011):

1. A bat and a ball cost $1.10 in total. The bat costs a $1.00 more than the ball. How much does the ball cost?

If you are like most people, you see this as a simple problem and quickly determine the cost of the ball is 10 cents. Not so fast. If the ball costs 10 cents and the bat a dollar more,then the bat would cost $1.10 and the total would be bat ($1.10) plus ball ($0.10) equals $1.20. How can that be? It cannot be; we have exceeded the total ($1.10). The correct answer is the ball costs 5 cents. Most of us **do not** engage System 2 to check our answer, and that is a mistake.

2. If it takes 5 machines 5 minutes to make 5 widgets, how long would it take 100 machines to make 100 widgets?

We hear the whisper, "Be careful." The fast answer is 100 minutes. Wrong! It takes exactly the same time for 100 machines to make 100 widgets as for 5 machines to make 5 widgets—5 minutes is the correct answer.

These two illustrations demonstrate the difficulty of having *deliberate* System 2 check and override *automatic* System 1. Overcoming the impulses of the automatic system is easier said than done. The automatic system of thinking flows easily and effortlessly. Self-control in thinking is difficult.

In short, it is impossible to completely avoid the dysfunctions produced by the fast thinking of the automatic system. Further, constant monitoring by System 2 is mind-numbing, slow, and too inefficient to serve as a substitute for System 1, especially for routine decisions. Thus the dilemma: System 1 operates too fast and is prone to mistakes, but System 2 is much too slow for routine decisions. Both fast and slow thinking are essential in everyday life. The challenge is to learn to recognize circumstances in which errors are likely and try hard to avoid major mistakes when the decisions are critically important (Kahneman, 2011).

Rational and Intuitive Thinking

Chester Barnard (1938) was one of the first scholars of administration to distinguish between *logical* and *nonlogical* processes of thinking and deciding. Logical processes refer to conscious thinking and reasoning that leads to rational conclusions in terms of goals. Alternatives are made explicit and consequences of each are calculated and evaluated in terms of the likelihood of attaining the goals. This is a rational and analytic contribution in the process of deciding.

Nonlogical thinking is rapid and without the rational process of considering alternatives, consequences, and the likelihood of goal achievement. The process is too fast for sequential analysis. This fast decision making is clearly System 1 thinking;however, not all fast thinking is nonlogical.

Intuitive thinking is often seen as mysterious and even magical thinking because it occurs quickly, without apparent logical thought, and when used by experts, is frequently correct in its conclusions. Hebert Simon (1987) was one of the first scholars to demystify intuition. In his study of expert chess players, for example, he found that grandmasters could make skillful moves in a few seconds simply by glancing at the positions on the board and then selecting the next move. In other words, they made rapid decisions with apparently little analysis; that is, they were intuitive and correct in their thinking and deciding.

But upon closer scrutiny, such intuition is a result expert knowledge and experience (Epstein, 2010; Klein, 2003; Simon, 1987, 1992). Intuitive thinking is based upon associations and pattern recognition. Simon (1992) succinctly explains: "The situation has provided a cue: this cue has given the expert access to information stored in memory, and the information provides the answer. *Intuition is nothing more and nothing less than recognition*" (p. 155, emphasis added).

Intuition is an enigma, even among experts, because they know but cannot explain *how* they know. Experts have great difficulty explaining the thinking undergirding their spontaneous behavior: for example, chess masters' rapid moves on the chess board (Simon, 1987); firefighters' sudden urge to escape a burning house just before it collapses (Kahneman, 2011); art experts' strong "gut feelings" of a fake (Gladwell, 2005); and expert pilots' experience of "leemers"—feeling things are not quite right (Weick & Suttcliffe, 2001). Kahneman (2011) cogently observes that the major message of Simon's (1987) conclusion about intuition is the "mystery of knowing without knowing" is not a unique feature of intuition, but rather "it is the norm of mental life" (p. 237).

In summary, intuition by experts is not merely automatic thinking. On the contrary,such intuition involves rapid, automatic thinking (System 1) as well as slower, rational thinking (System 2). In the first phase, an initial plan automatically comes to mind with the use of associative cues and memory, followed by a more deliberate process in which the plan is quickly and mentally simulated and checked to see if it will work (Simon, 1987). It seems likely that experts,in contrast to novices, use the time gained by their knowledge, experience, and automaticity to engage their deliberate system for a quick validity check of their initial plan. Not surprisingly, sound administrative thinking is a function of fast, automatic thinking as well as slow, deliberate thinking. The challenges are to find the right blend

of both, depending on the situation, and to slow down automatic thinking when the decisions are critical.

Heuristics and Fast Thinking

Closely related to automatic, fast thinking are heuristics. Heuristics are simple processes that help find quick, but imperfect, answers to difficult problems; they often take the form of simple rules of thumb that guide thinking and enable rapid and efficient decision making. For example, the rule in blackjack to "hit on 16 and stick on 17" is a heuristic that accelerates and simplifies thinking. In this case the heuristic is useful and efficient, but many heuristics for complicated administrative thinking are misleading and produce poor judgments.

Let us consider a few heuristics and their accompanying traps. The *recognition heuristic* is the tendency to infer a higher value (e.g., stronger, faster, better) to that which is familiar. Sometimes this heuristic works fine, but often it is misleading. People seize upon the familiar, stop thinking, and do not search among the unfamiliar options; they simply do not consider novel and creative ideas. Fast thinking encouraged by the familiar undermines creative thinking and often prematurely stops analysis.

The *availability heuristic* is the tendency to base judgments on information already available to the individual. Although what an individual immediately knows is fast, it is also limiting. Further, this heuristic causes people to overestimate the frequencies of events and to make errors (Tversky & Kahneman, 1974). What is immediately available in memory is often inadequate and sometimes misleading.

The *representative heuristic* is the tendency to see others as the typical stereotype that they represent. For example, an accountant is viewed as smart, precise, and introverted. Even though such quick judgments are incomplete and often in error, they are quite common (Tversky & Kahneman, 1981).

The *affect heuristic i*s the tendency to let personal likes and dislikes determine beliefs. For example, political preferences influence the arguments that are persuasive. If you are a political conservative, you will likely believe that government programs are intrusive and ineffectual. Although your mind may not be completely closed to reasonable argument to the contrary, the tendency is to seize upon evidence that confirms your bias.

There are plenty of other heuristics that are used in thinking, but these illustrations should demonstrate how the mind, especially fast System 1, uses quick shortcuts as to make judgments. Although heuristics are helpful in simplifying and enhancing speed, as problems become more complex, shortcuts become increasingly more tempting, but also more laden with traps and more likely to mislead. The deliberate, analytic system has difficulty

slowing down the fast, impressionable system, which is biased to believe and exaggerate emotional reactions. In the context of heuristic thinking, the fast, automatic system is relatively undemanding and confirming, rather than demanding and critical—a tendency that enhances, rather than curbs, errors in thinking.

In an attempt to explain why individuals resort so often to heuristics, Kahneman (2011) argues that when individuals cannot find a quick and satisfactory answer to a difficult question, they substitute an easier question. That is, the heuristic becomes the substitution of a simpler problem that has an immediate solution for a tough one without a clear answer. For example, the problematic query as to whether a particular candidate can be successful is often neglected by substituting the more easily answered question of whether she interviews well. An active, fast, coherence-seeking System 1 frequently suggests answers to an undemanding, rational System 2 (Kahneman, 2011). The pleasure of cognitive ease overwhelms the effort of rigorous thought—a trap to which hard-working administrators can easily succumb.

Concurrent Thinking

F. Scott Fitzgerald (1945) once suggested that the test of a first-rate mind was the capability to hold two opposing ideas in mind at the same time and still function effectively. Thinking often is confronted by opposing ideas, both of which are attractive. Blau and Scott (2003) call such a situation a dilemma, that is, a choice between two valued alternatives such that either option sacrifices some desirable objective in the interest of the other. Consider, for example, the dilemma of order and freedom. For most of us, both are desirable, but the rub is that the factors that increase order typically sacrifice freedom, and conversely, those that enhance freedom sacrifice order. Clearly, dilemmas induce tensions by focusing attention on the opposable ideas embodied in the choices.

The challenge is to cope with the tension of the opposing ideas in a constructive fashion rather that choose one alternative at the expense of the other. *Concurrent thinking* is the ability to embrace the opposites of a dilemma and select a path that preserves the benefits of the opposing ideas while avoiding the pitfalls of each (Bailes & Hoy, 2014). Such thinking is creative and integrating. It rejects either-or choices and insists on conjunctive solutions that combine opposites in novel ways. Roger Martin (2009) described such integrative thinking as the ability to hold two diametrically opposing ideas in the head and then act by blending the best of both ideas, a hallmark of exceptional leaders. Concurrent thinking enables one to

flourish in the midst of contradiction; it is a cultivated thinking skill, critical to finding innovative solutions to problems, and a useful tool for leaders, a topic to which we will return later in an analysis of leading.

DECIDING

Thus far the analysis has focused primarily on thinking. The inquiry now shifts to deciding, which is closely related to thinking; in fact, the distinction between the two is somewhat arbitrary. The analysis on deciding emphasizes the process of administrative decision making—more specifically on recognizing problems, determining goals, generating alternatives, weighing the consequences of each option in terms of goals, and finally making the choice. Nudging individuals is an underutilized strategy for helping others make good decisions, which we will discuss in some detail.

Optimizing

The classical model of decision making assumes individuals can make the best decision, that is, that they can optimize their solutions. Optimizing, however, is an unrealistic ideal (Simon, 1947) because decision makers virtually never have access to all the relevant information, are not completely rational in their thought and action, cannot generate all the possible alternatives, and cannot reliably predict the likely consequences of each option. In brief, optimizing assumes cognitive-processing capacities, rationality, and information that decision makers simply do not possess; consequently, the optimizing model is not useful to practicing administrators.

Satisficing

Given the serious practical limitations of the optimizing model, a more realistic approach is needed. Herbert Simon (1947) was the first to provide such a model for administrative decision making. What was needed, he argued, was a more accurate description of how effective managers and leaders make organizational decisions (Simon, 1947). Because human beings simply do not have the cognitive capabilities and resources to optimize (find the best solution), they search and explore alternatives until an acceptability threshold is found. Simon (1956) coined this search process "satificing"—a combination of satisfying and sufficing; that is, search until options are found that are both satisfactory and sufficient. He also created the complementary concept of "bounded rationality"—rationality in decision makers is narrowed to the information at hand, to the cognitive limitations of their mind, and to the amount of time they have to decide

(Simon, 1956). Thus, satisficing and bounded rationality are key elements in real-world decision making.

Simon's (1947) cyclical process of deciding includes defining the problem and objectives; collecting and reviewing relevant information;establishing the criteria for a satisfactory solution (setting the limits that the decision maker must meet if the decision is to be judged satisfactory); searching for alternatives until a set of options is identified that meet the threshold of satisfaction (satisficing); deliberating and selecting a course of action that is likely to produce an acceptable outcome; and finally, implementing and evaluating the action in terms of the pre-established criteria of adequacy.

In the end, managerial deciding is limited and anchored by bounded rationality and satisficing. An expanded discussion of the satisficing model, including illustrations and examples, can be found elsewhere (Hoy & Miskel, 2013; Simon, 1947, 1956). Suffice it to say, Simon's satisficing is arguably the most widely accepted one for rational managerial decision making.

Simon (1987) also developed four basic principles that guide skillful administrators as they engage in solving problems and making decisions:

1. Solving problems takes precedence over reflecting on causes. Looking backwards should be limited to diagnosing causes. Fixing responsibility for mistakes should be postponed until a new course of action is implemented.
2. The administrator accepts personal responsibility for discovering and proposing solutions instead of shifting responsibility to either superiors or subordinates, notwithstanding that the search for solutions may be a collaborative effort including many individuals.
3. The administrator has the personal responsibility for implementing a plan of action to solve problems, which may include securing the necessary authority from above and cooperation from below.
4. Although fixing blame for problems is an important part of the problem-solving process, the primary purpose of such activity is *to learn* what to do in the future in order to avoid problems, *not to punish* those who may have caused the problems.

Use of these principles produces good administrative habits of practice and helps create an organizational culture in which individuals readily learn from each other. Habits of response to problems are developed as administrators grapple with solutions both in meetings and in interactions with individuals. Attention is repeatedly focused on defining the problems until everyone agrees on the definition. Next, attention is directed toward generating possible alternatives and weighing their consequences. The most reliable base of administrative influence is the power to set the agenda and to focus attention (Simon, 1987). Administrators need to develop an

approach to solving problems that shapes their own "habits of attention" as well as those of their colleagues. Simon explains (1987): " 'shaping habits of attention' is identical to 'acquiring intuitions.' The habit of responding to problems by looking for solutions can and must become intuitive—clued by the presence of the problem itself " (p. 63). Simon concludes that intuition and good judgment are simply analyses frozen into habit and the capacity to respond quickly through recognition.

Nudging

Thaler and Sunstein (2008) coined the term *libertarian paternalism* to describe an approach to deciding that assumes individuals need freedom to exercise choice (libertarianism) while simultaneously being guided to make good choices (paternalism). In other words, gentle nudging helps people make decisions that benefit rather than harm them. The term libertarian paternalism is off-putting to many individuals. Perhaps a better term for this approach is *bounded free choice*, which is consistent with Simon's notions of bounded rationality and satisficing. Clearly, the power to set the agenda and to focus attention are ways of bounding choice.

Using bounded free choice, administrators organize and design contexts that produce predictable and positive behavior. *Nudging* is the process of influencing people's choices by altering the circumstances of choice to produce a desired outcome. Nudges are not mandates, but rather they are gentle interventions that guide behavior. In the end, however, individuals have the freedom to make any choice.

Defaults. A few examples of nudging illustrate its power to influence deciding.[1] *Defaults* are built-in options that take effect if individuals do nothing when confronted with a decision. Take the example of applying for a driver's license. A frequent question on applications is the choice to participate or not in an organ donor program. In the United States, applicants must choose to "opt in" to the program. The default is to "opt out "; do nothing and you are *not in* the program. In France, the default is to opt in. Do nothing and you are *in* the program. In the United States only 28% of drivers are organ donors, whereas in France, 99% of drivers are organ donors (Gigerenzer, 2007, p. 183). The default nudge can make a dramatic difference in decisions.

Let us turn to a school example. One of the many problems confronting teachers and school leaders,especially in urban districts with a large proportion of disadvantaged students, is getting talented students to select challenging classes. In one such school, the principal was sensitive to the fact that many good mathematics students were not selecting the next courses in the math sequence. Students simply did not sign up for Algebra II in spite of their success in Algebra I. The principal, in consultation

with the mathematics teachers, decided that all Algebra I students who earned decent grades and had reasonable attendance would automatically be enrolled in Algebra II; the default was that proficient students were in the next course. Left on their own, too many good students, for a variety of reasons, failed to opt in. But when the default was changed to "you are *in* unless opt *out*," more students ended up in the advanced courses.

Students were free to choose, but they received several nudges. First, the default provided a gentle push to stay in the next course. But if proficient students decided to drop out of the course, they received a second nudge, which was a process of encouragement, reassurance, and expression of personal concern by teachers. Finally, in a few instances in which the students were exceptional in mathematics, permission to drop the course was not given until the principal had a parental conference to again nudge the student in the right direction. In the end, the students and parents had the right to opt out of the sequence, but only after a series of gentle nudges (Bailes & Hoy, 2014).

Prompts and cues. People like to think of themselves as rational and infallible; they believe that they can escape tricks the mind plays on others, but they are wrong. In a perfect world, individuals would make informed and rational decisions, but in reality most of our choices are influenced by subtle prompts and cues over which we have little control, as the automatic system is primed to act quickly.

Framing is a powerful nudge that shapes decisions in terms of losses or benefits. Thaler and Sunstein (2008) provide the example of doctors informing a patient of her surgical options: One doctor says, "Of the 100 people who have undergone this procedure, 10 have not survived." The framing of the issue is likely to produce hesitation and fear. If the doctor, however, suggests that, "Of the 100 people who have undergone this procedure, 90 have survived." Individuals are more confident because of the emphasis on the high probability of success and survival. For most, the first statement triggers the automatic system to warn individuals of the peril (*Ten people are dead!)* before the rational, reflective system can compare the two statements and conclude that they are exactly the same. Positive framing nudges individual toward beneficial choices.

Channeling is yet another way to cue behaviors: dissuade poor choices by removing small obstacles that stand in the way of sound choices. Lewin (1947) was first to identify channel factors, small influences that facilitate or inhibit progress. People typically take the path of least resistance just as water runs downhill, but such a path is often riddled with impediments. Removing those obstacles can channel behavior. For example, promote good eating habits in the school cafeteria by making it easy to select nourishing foods and more difficult to find less healthy selections.

Attractively arrange good selections directly in students' sight lines and obscure bad food choices.

Channeling can also be used to promote positive teacher behaviors. Rather than promising rewards to teachers whose students make significant academic gains, remove impediments that make teaching difficult. Substitute rich instructional materials for dated ones; eliminate the burden of paper work by creating time for collaboration; and exclude "talking heads" in favor of top-notch programs of professional development. The logic of bounded free choice and channeling implies that teachers are more likely to be effective when administrators remove obstacles to good teaching rather than by providing extrinsic rewards for hightest scores (Ariely, 2010).

In brief, administrators can organize and design contexts (choice architecture), producing predictable and positive behaviors that influence thinking. Tools for nudging individuals to make good choices include, but are not limited to, the use of defaults, framing, and channeling. The golden rule of successful nudging is: Nudge in directions most likely to help and least likely to harm (Thaler & Sunstein, 2008).

LEADING

Leadership is arguably the most overused word in 21st century America. Whether the context is business, education, military, politics, or sports, the word is everywhere; it is magical and synonymous with success. Part of the problem is that leadership has two meanings, incorporated in a single term, and hence two connotations—one is a description of the role of a leader, whereas the other is an evaluation of the individual's performance (Halpin, 1966).The dual meaning puts undue burden on the term and at the same time causes confusion rather than clarity.

Most people think of leadership and leading as evaluative. Individuals who are successful are by definition leaders. The goodness of leading is undisputed; perform well and you carry the mantel of leadership—the glories of position, the joys of commitment, the sense of power and importance, and the exhilaration of conflict, suspense, and achievement (March & Well, 2005). Unfortunately, leading has become a celebrity term as well as common cliché, which makes the systematic study of leadership as a descriptive phenomenon difficult at best.

Leading is not all glory; it requires initiative, interpersonal skill, competence, creativity, organization, and hard work. It is difficult, situational, and a balancing art. At the heart of the process is the struggle to solve the fundamental dilemmas of organizations. As was noted earlier, dilemmas are situations that require a choice between two valued alternatives such that either option sacrifices some desirable objective in the interest of the other

(Blau & Scott, 2003). The great physicist, Niels Bohr, similarly defined a dilemma as a struggle between "profound truths," as recognizable by the fact their opposites are also profound truths; both are desirable, but to achieve one necessarily undermines the other (as cited in March & Well, 2005). There are no permanent solutions to such dilemmas, but rather balancing and accommodating opposite and valued goals.

Leaders who are skillful at concurrent thinking are most likely to cope successfully with the tensions of the opposing ideas embodied in basic organizational dilemmas. Such leaders have the ability to embrace the opposites of a dilemma and select a path that preserves the benefits of both while avoiding the pitfalls of each—doing so in creative and integrating ways. The act of blending the best of diametrically opposed ideas into a fruitful strategy is the linchpin of leading. Such leadership flourishes in the midst of conflict, confusion, and contradiction. Some of the fundamental challenges of organizational leadership are revealed and illustrated next in a series of organizational dilemmas.

Control and Autonomy

The first dilemma is the conflict between managerial control and worker autonomy, a classic problem faced by all institutions (Blau & Scott, 2003). Organizations need at least a modicum of control to coordinate the enterprise and efficiently move activities toward their goals. Yet it is autonomy that enhances the creative and innovative aspects of organizational life. The hallmark of professionalism is autonomy in using competence and expertise to make decisions in the best interests of clients. As schools become increasingly more professionalized, the conflict and tension between managerial control and professional autonomy heighten.

Organizations need control over operations for efficient performance as well as autonomy for workers to innovate and foster creativity. This issue is not a simple either-or decision, but one that calls for concurrent thinking to initiate the right balance between guiding action and nurturing autonomy; it is a balance that changes as situations change. The creative blending of these opposing goals is a continuous leadership challenge.

Consistency and Ambiguity

A second quandary facing administrators is not unlike the first. Leaders need consistency to dampen contradictions that impede effectiveness. At the same time, organizations need enough ambiguity and flexibility to enable them to adapt as needed to changing circumstances. Clearly,consistency

and ambiguity are opposite paths, but both have their merits. The leader's task is to create structures that provide consistency without impeding the flexibility needed to promote spontaneous adaptation and innovation.

One such mechanism to deal with this issue is to establish administrative procedures and arrangements that enable the basic mission of the organization rather than hinder it. Enabling organizational structures help teachers pursue the mission of the school without falling prey to rules and regulations designed to promote consistency (Adler & Borys, 1996; Hoy & Sweetland, 2001). The leader's challenge is to find the appropriate balance and blending of consistency and ambiguity necessary for schools to achieve effectiveness without relinquishing their ability to adapt and innovate in changing circumstances.

Unity and Diversity

Unity is a leader's dream because it produces harmony, purpose, and team spirit, and galvanizes the group toward its goals with minimum conflict. Its opposite, diversity, often impedes progress, yet it is an invaluable group attribute because diversity provides multiple perspectives, enhances understanding, and encourages innovative behavior. Once again, the leader is impaled on the horns of a dilemma. The issue is the coexistence of unity and diversity in functional ways such that both benefit the organization. The leader must read the situation and develop an approach to keep both unity and diversity functioning without permitting either to suffer; the challenge is clear, but difficult—creative actions by grappling with the opposing ideas of unity and diversity, embracing both and eliminating neither.

Planning and Initiative

The need for centralized planning and individual initiative poses another dilemma for organizations (Blau & Scott, 2003). Some organizational problems can be routinized, but not all of them. Inevitably, issues arise that require initiation of action not defined informal plans. Some administrators develop elaborate plans to prevent deviation from the "program," yet spontaneous problems frequently call for new initiatives; in fact, the more professional the work staff, the more unlikely preconceived plans will satisfactorily address all the complex issues that arise.

Planning, with its focus on standard ways to deal with routine issues, restrains the initiative needed to solve emerging problems. There is tension between planning to deal with routine issues and flexibility to solve novel problems. Plans are never complete enough to deal with the unexpected.

Yet the temptation to apply existing plans to circumstances even if they do not apply is always there. Leadership is much more than creating and implementing plans; it also requires creative solutions to unexpected problems. Although both planning and initiative are important aspects of administration, the leadership challenge requires balancing and blending these contrasting imperatives by using the best of each and avoiding the pitfalls of both.

Coordination and Communication

There are at least three ways in which decisions can be improved with open communication (Blau & Scott, 2003). First, social support lowers anxiety; engaging in discussions with others builds confidence and provides a framework for consultation that mitigates apprehension. Second, open communication cuts down on errors; it is easier to detect errors in others than in oneself. Third, competition for respect in discussions provides incentives for positive suggestions and critique. In brief, social support, error correction, and constructive competition are important features of open communication that promote sound decisions.

Although such communication enhances problem solving, it impedes coordination. Unrestricted communication generates a myriad of ideas, issues, and problems; it creates a virtual "battleground" of conflicting perspectives and proposals that makes agreement difficult (Blau & Scott, 2003). It is an irony that open communication makes coordination problematic because both open communication and coordination are critical elements of effective deciding. The advantages of open communication, however, are often roadblocks to efficient coordination; there is the rub. The leader's challenge is clear: Seize the advantages of open communication while simultaneously maintaining efficient coordination. This dilemma cannot be completely resolved—it must be endured in ways that capture the positives of both open communication and effective coordination while minimizing the negatives of each—another exercise in concurrent thinking.

Stability and Change

Finally, both stability and change are integral parts of organizational life. Some stability is necessary for organizational functioning; chaos is simply unacceptable and dysfunctional. Stability enables the organization to move toward the achievement of its goals relatively unencumbered by dissension and changing conditions. Change, however, is an important goal in itself, especially the kind of change that leads to adaptation and innovation. Both stability and change have positive and well as negative consequences. Both are desirable, yet neither is sufficient. These opposites have much to

offer, and yet a persistent dilemma is highlighted again: to focus on either stability or change undermines the other. The key leadership challenge is to find the right balance of stability and change. There is no simple formula to this problem because the appropriate blend changes as the situation varies.

In brief, leading is a dilemma-bound process; it is virtually impossible to lead without confronting the institutional dilemma of order and freedom. All of the dilemmas discussed in this analysis are instances of this one general dilemma—order versus freedom. The faces of order are control, consistency, unity, planning, coordination, and stability: They create a world of rules, plans, purpose, and coordinated action. In contrast, the faces of freedom are autonomy, ambiguity, diversity, spontaneity, open communication, and change: They create a world of imagination, innovation, creativity, vision, dreams, and hope. Both faces are imperatives to successful organizational functioning even though they are countervailing forces.

SUMMARY AND CONCLUSIONS

The current inquiry has been an analysis of thinking, deciding, and leading—three critical features of administration. These three processes form a reciprocal whole with each influencing and being influenced by the other (see Figure 1.1). The thesis is that leading is much more than a glamorous word that describes success. In the context of organizations, leading is anchored in thinking, deciding, and grappling with fundamental personal and organizational dilemmas.

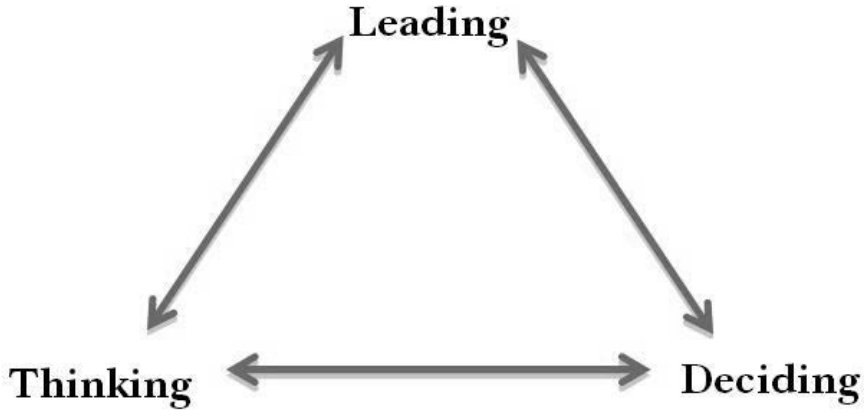


Figure 1.1. Triarchic reciprocal relationship.

Thinking is part of a dual-processing system of the mind composed of a fast, automatic, effortless system and a slow, reflective, effortful one (Kahneman, 2011). A major function of the slow deliberate system is to hold in check the rapid, freewheeling, automatic system. The quandary is that automatic thinking often operates too fast and is prone to mistakes whereas our deliberate, reflective system is much too slow for routine decisions. Both fast and slow thinking are essential in everyday life. The challenge is to learn to recognize those situations in which errors are likely and avoid major mistakes when decisions are critical.

It would be a mistake, however, to assume that all fast thinking is non-logical and flawed. Simon (1987) was one of the original scholars to clarify that intuition by experts was a rational form of fast thinking and not merely automatic thinking. The initial solution quickly comes to mind because of associative cues, pattern recognition, and memory, followed by a more deliberate process in which the plan is promptly and mentally simulated and checked to see if it will work (Simon, 1987). Such quick thinking and checking is a function of expertise and knowledge. Novices, however, are well advised to avoid fast, intuitive thinking because they simply do not have the knowledge base to make rational, intuitive decisions.

Use of heuristics speeds up the decision making process by using simple rules to make quick decisions. Although heuristics are helpful in simplifying and enhancing speed, as problems become more complex, the shortcuts become increasingly more tempting but also more laden with traps and more likely to mislead. The slow, deliberate system has difficulty reining in the fast, impressionable system, which is wired with biases. In the context of heuristic thinking, the automatic system is relatively undemanding and confirming rather than demanding and critical, a factor that enhances rather than curbs errors. Thus, use heuristics sparingly and carefully; they are more likely to mislead and trap when confronting complex problems.

Because human beings simply do not have the cognitive capabilities and resources to optimize (i.e., find the best solution), skilled administrators satisfice by searching until options are found that are both satisfactory and sufficient. Simon's (1947) model for administrative deciding includes defining the problem and objectives, collecting and reviewing relevant information, establishing the criteria for a satisfactory solution (setting the limits that the decision maker must meet if the decision is to be judged satisfactory), searching for alternatives until a set of options is identified that meet the threshold of satisfaction (satisficing), deliberating and selecting a course of action that is likely to produce an acceptable outcome, and finally, implementing and evaluating the action in terms of the preestablished criteria of adequacy. Rationality is bounded by the information at hand, the cognitive limitations of the mind, and the amount of time available to

decide. In brief, administrative deciding is anchored by bounded rationality and satisficing.

The most reliable base of administrative influence is the power to set the agenda and focus attention (Simon, 1987). Thaler and Sunstein's (2008) choice architecture is especially useful in this regard. The agenda is set and influenced by nudging people to make decisions that benefit rather than harm them, a process called bounded free choice. Individuals always have the freedom to decide, but setting the agenda by designing situations to produce a desired outcome is a soft and effective attention-getter. In addition to nudging, establishing defaults, framing, and channeling are other mechanisms that help design contexts to produce predictable and positive behavior, which influences thinking and deciding. Successful nudging is accomplished by using guided free choice: nudging in directions most likely to help and least likely to harm (Bailes & Hoy, 2014; Thaler & Sunstein, 2008).

Leading is strongly influenced by thinking and deciding, but it is also a dilemma-bound process, a fact usually neglected in the extant leadership literature. Leading in organizations is virtually impossible without confronting the inherent organizational dilemma of order and freedom.

Leaders are expected to control organizational performance while simultaneously nurturing autonomy. Leaders seek consistency to eliminate conflicts, and at the same time, welcome enough ambiguity to promote innovation. Leaders pursue purpose and unity to minimize problems and yet they are responsible for cultivating diversity as source of understanding and creativity. Planning avoids problems while spontaneity fosters opportunities. Leaders are responsible for coordination, yet they need open communication to make sound decisions. Finally, leaders cultivate stability to achieve goals while they nurture change to foster innovation.

In brief, a leader must promote the faces of order—control, consistency, unity, planning, coordination, and stability—while encouraging the faces of freedom—autonomy, ambiguity, diversity, initiative, communication, and change. Order creates a world of structure, rules, plans, purpose, and coordinated performance, whereas freedom fashions a world of imagination, novelty, creativity, vision, dreams, and hope. Effective school leaders embrace the opposites of this dilemma by acting to preserve the benefits of each while avoiding the pitfalls of both: They embrace both order and freedom and then find the right balance to fit the situation (Hoy & Miskel, 2013).

Finally, the key ideas of this inquiry are captured in the following practical guides for thinking, deciding, and leading:

1. Slow down automatic thinking when the decisions are critical.
2. Employ heuristics for routine problems, but avoid them for complex ones.

3. Anchor decisions in satisfactory and sufficient options rather than in searches for the illusive "best" alternative.
4. Use choice architecture to focus attention.
5. Nudge individuals in directions that are most likely to benefit them and least likely to harm.
6. Embrace both order and freedom by selecting a path that preserves the benefits of both while avoiding the pitfalls of each and then change the blend as circumstances change.
7. Master concurrent thinking for creative leadership by blending the best of diametrically opposed ideas into a fruitful strategy.

NOTE

1. For a more extensive review and analysis of nudges see (Bailes & Hoy, 2014) and (Thaler & Sunstein, 2008).

REFERENCES

Adler, P. S., & Borys, B. (1996). Two types of bureaucracy: Enabling and coercive. *Administrative Science Quarterly, 41,* 61–89.

Ariely, D. (2008). *Predictably irrational: The hidden forces that shape our decisions.* New York, NY: HarperCollins.

Bailes, L., & Hoy, W. K. (2014). Designing school contexts for achievement: Paternalism or libertarianism? *International Journal of Educational Management, 28,* 484–497.

Barnard, C. I. (1938). *The functions of the executive.* Cambridge, MA: Harvard University Press.

Blau, P. M., & Scott, W. R. (2003). *Formal organizations: A comparative approach* (2nd ed.). Stanford, CA: Stanford Business Books.

Epstein, S. (2010). Demystifying intuition: What is it, what it does, and how it works. *Psychological Inquiry, 21,* 295–312.

Fitzgerald, F. S. (1945).*The crack-up.* New York, NY: New Directions.

Frederick, S. (2005). Cognitive reflection and decision making. *Journal of Educational Perspectives, 19,* 25–42.

Gigerenzer, G. (2007). *Gut feelings: The intelligence of the unconscious.* New York, NY: Penguin.

Gladwell, M. (2005). *Blink: The power of thinking without thinking.* New York, NY: Little, Brown.

Halpin, A. W. (1966). *Theory and research in administration.* New York, NY: McMillan.

Hoy, W. K., & Miskel, C. G. (2013). *Educational administration: Theory, research, and practice.* New York, NY: McGraw-Hill.

Hoy, W. K., & Sweetland, S. R. (2001). Designing better schools: The meaning and nature of enabling school structure. *Educational Administration Quarterly, 37,* 296–321.

Kahneman, D. (2011). *Thinking, fast and slow.* New York, NY: Farrar, Strauss, and Giroux.

Klein, G. (2003). *Intuition at work.* New York, NY: Doubleday.

Lewin, K. (1947). Frontiers ingroup dynamics II: Channels of group life: Social planning and action research. *Human Relations, 1,* 143–153.

March, J. G., & Weil, T. (2005). *On leadership*. Malden, MA: Blackwell.

Martin, R. (2009). *Opposable mind.* Cambridge, MA: Harvard Business School.

Simon, H. A. (1947). *Administrative behavior: A study of decision-making processes in administrative organization* (1st ed.). New York, NY: Macmillan.

Simon, H. A. (1956). Rational choice and the structure of the environment. *Psychological Review, 63,* 129–138.

Simon, H. A. (1987). Making management decisions: The role of intuition and emotion. *Academy of Management Executive, 1,* 57–64.

Simon, H. A. (1992). What is an explanation of behavior? *Psychological Science, 3,* 150–161.

Stanovich, K. E., & West, R. E. (2000). Individual differences in reasoning implications: Implications for the rational debate. *Behavioral and Brain Sciences, 23,* 645–665.

Thaler, R. H., & Sunstein C. R. (2008). *Nudge: Improving decisions about health, wealth, and happiness.* New Haven, CT: Yale University Press.

Tversky, A., & Kahneman, D. (1974). Judgment under uncertainty: Heuristics and biases. *Science, 18,* 124–131.

Tversky, A., & Kahneman, D. (1981). The framing of decisions and the psychology of choice. Science, *21,* 453–458.

Weick, K. E., & Sutcliffe, K. M. (2001). *Managing the unexpected: Assuring high performance in an age of complexity.* San Francisco, CA: Jossey-Bass.

CHAPTER 2

ASSESSMENT LEADERSHIP

A Systems Perspective

Leslie W. Grant

ABSTRACT

Drawing on systems theory, this chapter provides a framework for understanding the knowledge and skills needed by leaders at all levels of the educational system to lead for assessment. First, background is provided on the emergence of standards related to assessment and leadership surrounding assessment as well as preparation and perceived competence of school leaders in assessment. Next, by applying Angyal's (1969) distinctions between relations and systems, the case is made that assessment is indeed a system and therefore a systems perspective to assessment leadership is appropriate. Drawing inspiration from Stein and Nelson's (2003) conceptualization of leadership content knowledge, assessment leadership is then discussed in terms of assessment as a nested system that is influenced by internal and external factors with implications for the type of assessment leadership needed at each level in the system. A case is made for assessment leadership grounded in tenets of systems thinking. The chapter ends with broad knowledge, skills, and dispositions that educational leaders should have at any level in the open, nested system that characterizes public education.

Leadership and School Quality, pp. 21–46

ASSESSMENT LEADERSHIP: A SYSTEMS PERSPECTIVE

No time in history has seen more focus on assessment than now. This focus on assessment has grown as the accountability movement has taken hold and become entrenched in public education. The important role of assessment in the teaching and learning process has been studied at the classroom, school, and district levels. With the advent of federal accountability policies, the role of these policies in improving student achievement has also been a focus of research and debate. However, across this research, few studies find that assessment does not have an impact on teaching and learning. At the classroom level, research has emerged over the past twenty years focusing on the critical importance of classroom assessment as having a tremendous impact on student achievement, although the degree of that impact is up for debate (Grant & Gareis, 2014). Research in the use of formative assessments in the classrooms shows an effect size between .32 and .70, depending on the study (Black & Wiliam, 1998; Fuchs & Fuchs, 1986; Kingston & Nash, 2011; McMillan, Venable, & Varier, 2013).

At the school and school district levels, effective schools research has focused on finding schools that are deemed "effective" and studying the characteristics of those schools. High-performing school districts use data to make decisions at the classroom, school, and district levels. They provide relevant data to schools, help schools understand how to interpret data, and use collaborative teaming to do so (Cawelti, 2004; Leithwood, 2010; Snipes, Doolittle, & Herlihy, 2002). The impact of state assessment systems and federal reform policies is less clear. Significant methodological challenges exist in making connections between state assessment systems and federal accountability policies and student achievement (Hamilton, Stecher, & Yuan, 2008).

In addition, the critical role of the educational leader has received much attention. Research studies at the school building level have found that principals have an indirect effect on student achievement (Hallinger & Heck, 1996; Leithwood, Louis, Anderson, & Wahlstrom, 2004; Marzano, Waters, & McNulty, 2005; Robinson, Lloyd, & Rowe, 2008). Effective schools research studies have found that one common element of effective schools is a strong leader (Cawelti, 2004; Snipes, Doolittle, & Herlihy, 2002). Leadership at the school district level is critical as well, with effective leadership being central to addressing challenges and sustaining reform efforts (Florian, 2000; Leithwood, 2010). At each level of the educational system it is the leader who provides both vision and management to the educational organization and, therefore, to assessment. Hence, if assessment is critical to student and organizational success, and if leadership is critical to student and organizational success, it follows that leadership for assessment is an important responsibility for leaders at all levels in educational systems.

The purpose of this chapter is to provide a framework for understanding and developing assessment leadership. This framework is grounded in systems theory and the application of this theory to assessment and assessment leadership. To that end, the chapter is organized in the following way:

1. First, background is provided on the emergence of standards related to assessment and assessment leadership as well as preparation and competence of school leaders in assessment.
2. Next, the case is made that assessment is indeed a system and, therefore, a systems perspective to assessment leadership is appropriate.
3. Assessment leadership is then discussed in terms of assessment as a nested system and, therefore, there are implications for the type of assessment leadership needed at each level in the system.
4. Finally, a case for assessment leadership grounded in tenets of systems thinking is made.

STANDARDS AND PREPARATION FOR ASSESSMENT AND LEADERSHIP

During the 1980s, standards for student assessment emerged as standardized assessments became more widespread and high-stakes. In 1985, the American Psychological Association, the American Educational Research Association, and the National Council on Measurement in Education jointly published the *Standards on Educational and Psychological Testing*. In 2003, the Joint Committee on Standards for Educational Evaluation published the *Student Evaluation Standards*. In addition to standards for student evaluation, standards for program evaluation were developed in 1981. These standards served as the measure by which sound assessment practices would be judged.

In addition, standards emerged related to assessment competencies that educators should have. For teachers, these standards include the InTASC Model Core Teaching Standards (Council of Chief State School Officers [CCSSO], 2011) and the National Board for Professional Teaching Standards (NBPTS), both of which focus on standards in assessment (NBPTS, 1989). The earliest standards to emerge included the *Standards for Teacher Competence in Educational Assessment of Students*, published in 1990. Similarly, organizations recognized the role of the educational leader in assessment and developed standards for educational leaders. The first set of standards developed included the *Competency Standards in Student Assessment for Educational Administrators* published in 1997. The development of these standards was a joint effort by American Association of School Administrators, the National Association of Elementary School Principals, the National Association of Secondary School Principals, and the National Council on

Measurement in Education. The 12 standards were organized around three main themes: educational leaders providing assistance to teachers, educational leaders leading the effort in developing policies related to assessment practices, and educational leaders using assessment data to make decisions and to communicate assessment results to stakeholders.

Other standards related to educational leadership focus on assessment as one aspect of the educational leader's role. The policymaking body that developed the 2008 Interstate School Leaders Licensure Consortium (ISLLC) Standards integrated assessment throughout the six standards. Table 2.1 shows the standards and functions from the standards that directly address assessment in the role of the education leader. Note the key words used: *collect, use, assess, analyze, evaluate, monitor, and ensure* (ISLLC, 2008). Each of these functions assumes a set of knowledge, skills, and dispositions related to assessment, and assumes that these skills are necessary throughout the educational system, to include instruction and management. Currently, the move toward further solidifying the importance of assessment in the role of the educational leader is afoot. In 2014, the CCSSO published a draft of the revised ISLLC standards. Rather than six standards, as in the 2008 version, there are now eleven. One clear signal in the development and revision of the 2014 standards is the focus on assessment. The proposed Standard 4 relates to Curriculum and Assessment and in its draft form reads, "An educational leader promotes the success and well-being of every student by promoting robust and meaningful curricula and assessment programs" (CCSSO, 2014, p. 17). According to the new standards, an effective school leader:

a. Ensures program rigor
b. Ensures culturally relevant curricula and assessments
c. Maximizes opportunity to learn
d. Ensures authentic learning and assessment experiences
e. Emphasizes assessment systems congruent with understandings of child development and standards of measurement
f. Ensures the use of learning experiences that enhance the enjoyment of learning (CCSSO, 2014, p. 17).

This signals a clear focus on the importance of leadership, not only in instruction, but also in assessment. In the 2008 ISLLC Standards, assessment was embedded within each standard, but in 2014, assessment has a standard all its own while still being embedded in other standards. In addition, one distinction between the 2008 ISLLC Standards and the 2014 draft ISLLC Standards is the application of the standards at the school *and* district levels, not just the building level.

Table 2.1. 2008 ISLLC Standards Functions Focused On Assessment

Standard	*Function Directly Addressing Assessment*
Standard 1: An education leader promotes the success of every student by facilitating the development, articulation, implementation, and stewardship of a vision of learning that is shared and supported by all stakeholders.	B. Collect and use data to identify goals, assess organizational effectiveness, and promote organizational learning E. Monitor and evaluate progress and revise plans
Standard 2: An education leader promotes the success of every student by advocating, nurturing, and sustaining a school culture and instructional program conducive to student learning and staff professional growth.	E. Develop assessment and accountability systems to monitor student progress I. Monitor and evaluate the impact of the instructional program
Standard 3: An education leader promotes the success of every student by ensuring management of the organization, operation, and resources for a safe, efficient, and effective learning environment.	A. Monitor and evaluate the management and operational systems
Standard 4: An education leader promotes the success of every student by collaborating with faculty and community members, responding to diverse community interests and needs, and mobilizing community resources.	A. Collect and analyze data and information pertinent to the educational environment
Standard 5: An education leader promotes the success of every student by acting with integrity, fairness, and in an ethical manner.	A. Ensure a system of accountability for every student's academic and social success
Standard 6: An education leader promotes the success of every student by understanding, responding to, and influencing the political, social, economic, legal, and cultural context.	C. Assess, analyze, and anticipate emerging trends and initiatives in order to adapt leadership strategies

However, many educational leaders lack training in sound assessment practices and in being able to see assessment as a "system." In a survey of school leaders, 72% of superintendents and 67% of principals agreed that preparation programs were out of touch with realities of school leadership and did not adequately prepare them for their roles and responsibilities (Farkas, Johnson, & Duffett, 2003). Furthermore, Darling-Hammond, LaPointe, Meyerson, Orr, and Cohen (2007) surveyed school principals on the effectiveness of their preparation program on 23 different items related to the roles and responsibilities of an administrator. Of the 23 items, the

item focused on using assessment data to make decisions was rated second to the lowest in terms of the effectiveness of preparation. Others have found a lack of focus on assessment preparation for educational leaders at all levels (Stiggins & Duke, 2008; Reeves & Burt, 2006). In addition, most educational leaders were once teachers, and assessment literacy training is an area of relative weakness for teachers; this is due, in part, to a lack of preparation in assessment (Gareis & Grant, 2008). The Council for the Accreditation of Educator Preparation (CAEP), the accrediting body for teacher and administrator preparation in the United States, defines assessment literacy as the ability to:

1. Identify, select, or create assessments optimally designed for various purposes, such as
   a. Accountability
   b. Instructional program evaluation
   c. Student growth monitoring and/or promotion
   d. Diagnosis of specific student needs (learning gaps)
2. Analyze, evaluate, and use the quantitative and qualitative evidence generated by external summative and interim assessments, classroom summative assessments, and instructionally embedded formative assessment practices to make appropriate decisions to improve programs and specific instructional approaches to advance student learning. Appropriate decisions depend upon a good understanding of test quality considerations and comparability issues (Kahl, Hofman, & Bryant, 2013, p. 8).

The focus in training educational leaders has changed over the past several decades to focus not only on the managerial aspects of education but on the ability to *lead* an organization through the development of a shared vision and mission (CCSSO, 2008; Reeves, 2009). In addition, over the past 30 years, focus has shifted to the role of the educational leader as an instructional leader. Research over the past two decades has revealed relationships between instructional leadership and student outcomes (Hallinger & Heck, 1996; Leithwood et al., 2004; Marzano et al., 2005; Robinson et al., 2008). While these are important findings, the naming of the teaching and learning work of the educational leader as instructional leader, particularly at the building level, masks the importance of the role of assessment in leadership as well as one other important aspect of teaching and learning: the curriculum. The term "assessment leadership" is a relatively new term on the educational landscape, as evidenced by a search of relevant databases. The search revealed only five relevant articles

that used the term "assessment leadership" as it is applies to K–12 schools. Table 2.2 shows these leadership arenas and definitions offered for each.

Table 2.1. Leadership Roles and Definitions

Leadership Role	*Definition*
Instructional Leadership	"A leader who advocates for a program of instruction that advances student learning and also develops and sustains a school culture that fosters the growth and development of everyone involves students and staff" (Hoy & Hoy, 2013, p. 2).
Curriculum Leadership	"The exercise of those functions that enable school systems and their schools to achieve their goal of ensuring quality in *what* students learn" (Glatthorn, 2008, p. 23).
Assessment Leadership	A leader who "understands the role of sound assessment in efforts to improve teaching and learning" (Stiggins & Duke, 2008, p. 286).

While the interest in instructional leadership has been one that has shifted the focus to teaching and learning, its very name assumes a focus on instructional practices rather than the broad domain of assessment in schools. Just as there are specific knowledge and skills needed to be an effective instructional leader, there are also specific knowledge and skills needed to be an effective assessment leader. To gain a greater understanding of assessment leadership, systems theory provides a way of conceptualizing and understanding knowledge and skills leaders need to have related to assessment at different levels in the educational system.

ASSESSMENT AS A SYSTEM

In introducing the idea of systems, Von Bertalanffy (1968) indicated that, "in one way or another, we are forced to deal with complexities, with 'wholes' or 'systems,' in all fields of knowledge" (p. 5). Systems are wholes with various elements or parts. Systems theory terms that have emerged in education include: systems thinking, systemic reform, systemic design, and others. The next logical question is whether assessment is indeed a "system." It would follow that if assessment is not a system, then there is no need for "systemic thinking" when it comes to assessment leadership.

Tenets of Systems Thinking

Angyal's (1969) work on making the distinction between relations and systems is instructive in thinking about assessment as a system. First, some

elements may be related to one another but do not form a system. He provides four distinct differences between relations and systems:

1. A relation requires only two members while a system involves several members. In a relation a direct line can be drawn between the two members while in a system it is difficult to put the connections between the elements in the system in a linear form.
2. In a relation, two members must have some aspect about each of the two members from which a relation can be established. In a system, however, members of a system become constituents of the system by their "place" in the system. In other words, the position in which the member is within the system places a value on that member in the system. Therefore, a member is not a member merely because it shares some quality with other members of the system.
3. In a relation members exist within some kind of domain but their relationship can be described without having to describe the domain. In a system, the dimensional domain must be part of the conceptualization of the system.
4. The parts of a system cannot be considered separately, they must be considered with respect to some other more inclusive factor in the system. This inclusive factor is the way in which the parts of the system are connected. In a relation, on the other hand, there are direct connections between two objects. "In a system the members are, from the holistic viewpoint, not significantly connected with each other except with reference to the whole" (Angyal, 1969, p. 22).

Tenets of Systems Thinking Applied to Assessment

These four distinctive features of systems can be applied to assessment in K–12 education. Each of the distinctive features of systems provided by Angyal (1969) is discussed below, with respect to assessment as a system:

1. *A system has an unspecified number of elements and the relations between those elements are nonlinear.* Consider the elements of assessments in the classroom and assessments administered at the school district level. A reading teacher may administer spelling assessments and reading comprehension assessments. At the district level, assessments are given for progress monitoring in reading across the district. In addition, at the state or provincial level, reading comprehension assessments may be given. There are myriad elements to this "system" of assessing reading comprehension and the rela-

tionship is not quite linear. To understand the reading ability of any given student, care must be taken to interpret assessment results at each level of the system within the context of the overall assessment system.

2. *Each member of the system has some positional value but its value is not inherent to the member.* Any given assessment is not of value in and of itself. It has a relationship to the other elements of the system. Any specific classroom assessment's value is tied to its place in the system of assessment within the classroom. For example, a formative assessment is tied to its place in preparing students for other assessments that may occur.
3. *Dimensional domain is important in the conceptualization of the system.* The dimensional domain of assessment separates levels of assessment within the educational system. In addition, this dimensional domain was critical in the formation of the assessment system overall.
4. *Some inclusive factor binds the elements in the system and any element within the system must be considered within the context of the whole.* Each of the elements in an assessment system is related by using and collecting data to make decisions related to students, programs, and indeed decisions about schools. Each layer in the assessment system must be considered within the context of the whole system.

In addition, systems can be viewed as closed or open or some degree in between (Razik & Swanson, 2010). In a closed system, external forces exert little influence and results are from within the system. Razik and Swanson (2010) refer to this as an aggregate mentality where various elements exist within the same environment but do not relate on a systemic level. Conversely, in an open system external influences can impact what occurs in the system and the system can exert influence over external environments. The broad educational system is viewed as an open system, thus the assessment system is an open system that is influenced by external forces. As an example, the state standardized assessment movement that began in the 1990s has had considerable influence over teachers' assessment practices in the classroom practices (see, e.g., Abrams, Pedulla, & Madaus, 2003; Supovitz, Sirinides, & May, 2010). Figure 2.1 demonstrates the aggregate mentality and viewing assessment as a closed system and Figure 2.2 shows the open system mentality when viewing assessment at the classroom, school district, and state levels. In Figure 2.1, these assessments exist within the same system but show no relationship to one another or to the overall system. They are viewed as separate entities and do not thoroughly explain how they are related as a system. Figure 2.2 demonstrates the connectedness of various levels of assessment to one another and to other elements

of the educational system such as curriculum, instruction, and student learning. Figure 2.2 demonstrates assessment as an open system that can be influenced by internal and external forces. Based on this review of systems theory and its application to assessment, we can view assessment as a system that is open and can influence or be influenced by other elements within the system or external influences outside of the system.

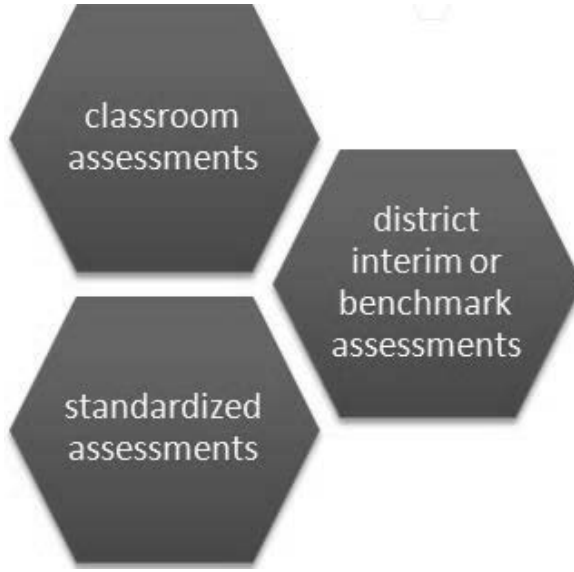


Figure 2.1. Aggregate mentality and assessment.

THE NESTED, OPEN SYSTEM OF ASSESSMENT

If assessment is a system, then, systems theory offers a way of conceptualizing and understanding assessment leadership at all levels within the educational system. Schools are viewed as a hierarchy of systems (Razik & Swanson, 2010) and Senge et al. (2012) referred to schools as nested systems. Figure 2.3 shows this relationship within the system of the nested communities. Therefore, we can take these elements that define systems and apply them to assessment. First, we explore assessment at each level in the system.

Classroom

Assessment in the classroom is within the purview of the classroom teacher and has received much attention over the past twenty years, beginning with the work of the Assessment Reform Group in the United

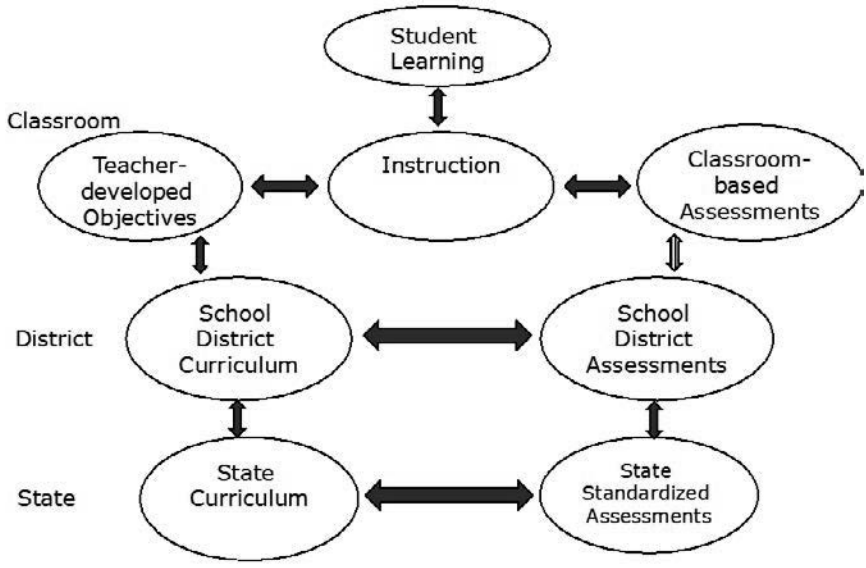


Figure 2.2. Connectedness of assessments.

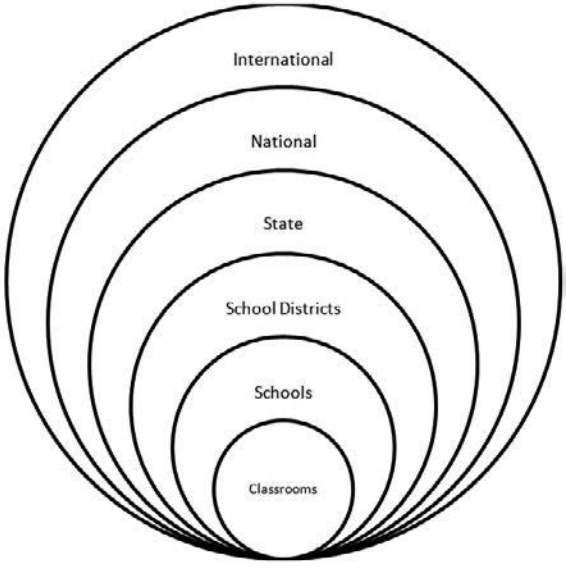


Figure 2.3. Connectedness of assessments.

Kingdom (Grant & Gareis, 2014). Teachers engage in diagnostic, formative, and summative assessments and use the data for purposes such as providing feedback to students, adjusting instruction based on how students perform, communicating the nature and degree of student learning to parents and other education professionals, completing report cards, and many other uses. Diagnostic assessments include reviewing prior student achievement data, observing students in the classroom, and reviewing student records. Formative assessments typically include observations of students, reviewing student work and providing feedback, and homework. Finally, tests, quizzes, achievement assessment results, and others typically are defined as summative assessments (McMillan, 2011; Popham, 2014; Russell & Airasian, 2012). A caveat to the division of assessments into these three categories is that any assessment can have diagnostic, formative, or summative purposes. It depends on how the assessment results are used by the teacher. Typically, classroom-level assessments are used for assessing individual student learning and to make decisions about instruction inside the classroom, but these assessments can have an impact on decisions made about students. For example, grades are based on classroom assessments and grades are used for a variety of purposes, such as making promotion/retention decisions, placing students into courses, and admitting students into colleges and universities.

School

Assessment at the school level involves focusing on the learning of students individually and in the aggregate. Teachers within a school may give common, formative assessments and these assessments are used to provide feedback on the nature and degree of individual student learning, as well as to make adjustments to program delivery within the school (Frey & Fisher, 2009). In addition, assessment is used to evaluate school programs for their effectiveness and make adjustments to the educational program. Therefore, assessment is used at the student level and the program level.

District

School districts engage in assessing student learning across schools. In many cases these may be progress-monitoring assessments to determine student progress according to specific standards or needs. These are referred to as interim assessments. Interim assessments are typically used to make adjustments to instruction, to evaluate the effectiveness of educational programs, and to predict how students will perform on end-of-year

state assessments (Perie, Marion, & Gong, 2009). Typically the data are aggregated across students and/or concepts to gain a greater understanding about the effectiveness of the overall educational program in advancing student learning. Perie et al. (2009) argue that "A good interim assessment can be an integral part of a state's or district's comprehensive assessment system, used in conjunction with classroom formative assessments and summative end-of-year assessments" (p. 13). But Shepard (2009) argued that unless these assessment systems are linked to curriculum and instruction, then the validity of these assessment systems are called into question. Indeed, Slavin, Cheung, Holmes, Madden, and Chamberlain (2013) found that the implementation of interim assessments was not enough. The use of the data in designing and implementing interventions was critical, demonstrating the connectedness of these assessments to the overall educational system. Shepard's (2009) argument demonstrates that the assessment system is part of an overall educational system, and if district-level assessments are not linked to other elements of the system, then they have no value.

State

As a result of the state standards movement and the impact of federal policy through the reauthorization of the Elementary and Secondary Education Act in 2002 (No Child Left Behind, 2002), state assessments are a mainstay of a broader assessment system. State assessments have an impact on institutional accountability, as student performance on these assessments impacts state school accreditation and have federal implications. As of 2012, all 50 states and the District of Columbia administered state assessments in mathematics, English/language arts, and science at the elementary, middle, and high school levels, and 11 states administered state assessments in social studies (Education Week Research Center, 2014). In addition, a review of state policies found that 24 states assigned ratings to schools based in part on performance on state assessments; 37 states used student performance on state assessments to reward high-performing or improving schools; and 32 states used student performance on state assessments to sanction schools (Education Week Research Center, 2014). State assessments are not just high-stakes for schools. An examination of state policies through 2011–12 found that 26 states required students to pass exit exams to receive a high school diploma (Center for Education Policy, 2012) and several states tied promotion to grade four to students' proficiency on the state reading assessment (Robelson, 2012). State assessment data are used to make decisions about students, to evaluate educational programs, and for institutional accountability purposes.

National

At the national level, the National Assessment of Educational Progress (NAEP) referred to often as the "Nation's Report Card" provides a "common yardstick" by which to compare student knowledge and skills nationwide in mathematics, reading, science, writing, the arts, civics, economics, geography, U.S. history, and technology and engineering literacy (National Center for Education Statistics, 2011). Other assessments given at the national level include the SAT, the American College Test (ACT), Advanced Placement (AP) examinations, and industry certification examinations. Depending on the scope and purpose of the assessment, these assessments are used at the student level to make decisions about credit given, admissions to colleges and universities, to make adjustments to school and school district programs, and as a comparison across schools and across states.

International

Since the 1960s, international assessments have been used to make international comparisons of students and the educational attainment and quality of education systems. During the 1960s, the International Association for the Evaluation of Educational Achievement (IEA) conducted the first international comparisons of student achievement (Husen, 1967). International comparisons continue today with the Trends in International Math and Science Study (TIMSS) and the Programme for International Student Assessment (PISA). Although these assessments are not used at the classroom level in terms of reporting individual student achievement, or even at the school level in terms of evaluating educational programs, they do exert an influence on teaching, learning, and policy at the national level. For example, during the development process of the Common Core State Standards (CCSS), the developers studied how high-achieving countries, according to performance on TIMSS and PISA, teach mathematics and reading (Conley, 2014). This study influenced the development of the CCSS, with some—including the Organisation for Economic Co-operation and Development (OECD), which develops the PISA—believing that the CCSS will result in improved American student performance on the international assessments (OECD, 2013), while others paint a dimmer picture (Loveless, 2012).

Table 2.3 provides a comparison of the nested levels and their uses of various levels of assessments. Stiggins and Duke (2008) explained that there are essentially three levels to consider for assessment: the classroom level, the program level, and the institutional accountability and/or policy level. Classroom, school, and school district levels use classroom assessment

data for various purposes. School, school district, state, and national levels use assessment data for evaluating educational programs. Assessments administered at the state, national, and international levels are used for institutional accountability and/or policy-making. Therefore, the place of the assessment in the system dictates the uses of the assessment data at various levels in the system.

ASSESSMENT LEADERSHIP IN A NESTED, OPEN SYSTEM

Since schools are nested communities, leaders are serving at different levels in the organization. What a principal needs to know and be able to do regarding assessment may be different than the skill set needed of a district-level leader. Stein and Nelson (2003) conceptualized this layered leadership in thinking about the content knowledge of academic subjects that leaders need to have at each level of the system. They suggest that administrators need to have mastery of one content area and develop expertise in other content areas by "post-holing" into an element of the content area (Stein & Nelson, 2003). This same process can be applied to developing assessment leadership. Assessment leadership can be defined as the knowledge, skills, and dispositions of assessment that leaders need to have within their level of the system. In addition, Stiggins and Duke (2008) argue that there are essentially three levels to consider for assessment: the classroom level, the program level, and the level of institutional accountability. They argue that a principal, in particular, should have an understanding of these levels and develop competencies related to understanding and employing assessments within these three levels (Stiggins & Duke, 2008). However, an educational leader at any level within the hierarchy of the nested systems needs to have an understanding of assessment at these different levels Figure 2.4 shows the nested learning communities with the educational leader within the nested community.

Table 2.3. Assessments at the Nested, Open Community Levels

Nested Community	*Classroom-Level Assessment*	*Program-Level Assessment*	*Institutional Accountability or Policy-Level Assessment*
Classroom	X		
School	X	X	
School District	X	X	
State		X	X
National		X	X
International			X

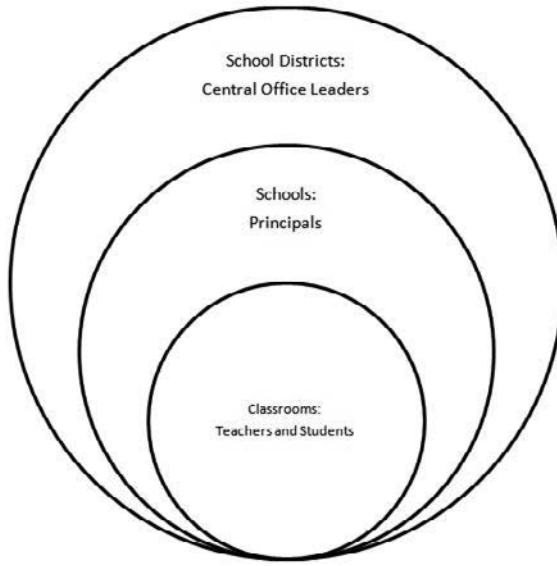


Figure 2.4. Nested leadership layers.

School-Level Assessment Leadership

At the school level, building principals and assistant principals are concerned with classroom assessment systems, using assessments to evaluate educational programs in the building, and understanding institutional accountability demands and their impact.

Classroom-level assessment. Because of their place in the educational system, school-level administrators have the greater capacity to work with teachers in developing skills in classroom-based assessment. However, the school-level leader may not be as involved in developing those skills. Researchers in both the United States and Canada have studied principals' perceptions in leading for assessment (Hellston, Noonan, Preston, & Prytula, 2013; Ulmer, 2002). In both studies, researchers found that administrators offered a moderate level of support in conducting classroom observations specifically aimed at teachers' assessment practices, but greater support through providing in-service training surrounding assessment (Hellston et al., 2013; Ulmer, 2002). The instructional supervision cycle, which includes providing teachers with effective feedback on matters—not only related to instruction but also to assessment—is necessary to bring about positive changes in teacher practices (DiPaola & Hoy, 2013). In addition, principals provided limited support in discussing assessment information with students. In both studies, however, one of the

top three areas of support involved encouraging faculty and staff to make decisions based on student assessment information (Hellston et al., 2013; Ulmer, 2002).

According to Stiggins and Duke (2008) the classroom assessment level, as compared to program level or institutional accountability level has the greater capacity to improve teaching and learning. They provide ten leadership competencies related to assessment, of which three focus specifically on classroom-related assessment practices (Stiggins & Duke, 2008). First, principals must understand principles related to sound assessment practice in the classroom and how assessments relate to intended learning outcomes for students. Second, principals can observe and evaluate teachers' assessment practices and develop teachers' assessment literacy within the supervision and evaluation cycle. Finally, the principal provides professional development surrounding assessment through either providing the training directly or facilitating the professional development experience. In addition, the active engagement of the principal in professional development is critical. In a review of educational research, Robinson et al. (2008) found that the principal's participation in and promotion of professional development for teachers had an effect size of .84. Therefore, due to the principal's place in the educational system and the place of classroom-based assessment in the overall assessment system, principals are on the front lines of providing direction and support for classroom-based assessment and the development of teachers' assessment literacy.

Program-level assessment. Program-level assessment includes any assessments that are used to assess the effectiveness of a program (Sanders & Sullins, 2005). School-level leaders are responsible for the educational programs implemented within their schools. The effectiveness of school programs can vary from school to school and can be influenced by many factors, including whether the best program was selected for the school context, fidelity of the program's implementation, perceptions of the effectiveness of the program, resources available for the program's implementation, and a host of others (Jason, 2008; Sanders & Sullins, 2005). In two studies of principals' perceptions related to assessment, principals reported that they occasionally to often make program-level or grade-level decisions based on student assessment data (Hellston, et al., 2013; Ulmer, 2002). At this level in the nested system, principals need to know how to evaluate school-based programs and understand how their school is impacted by district-level program evaluation.

Institutional accountability/policy-level assessment. In the United States, state achievement data are used to make judgments about school-level effectiveness and the degree to which schools are meeting the needs of students. This policy began in earnest with the passing of the No Child Left Behind Act (2002) through adequate yearly progress and continues in

the form of school-level, district-level, and state-level annual measurable objectives by way of the Elementary and Secondary Education Act (ESEA) flexibility requests (Center for Education Policy, 2014). Accountability is at the school level and principals must know how to interpret state achievement data and how to help teachers interpret and use state achievement data (Anderson, Leithwood, & Strauss, 2010).

District-Level Assessment Leadership

In the nested system, the classroom is nested within a school and the school is nested within the school district. The principal's direct responsibility is to know and understand classroom-level assessment, how to evaluate school programs, and how to interpret and use institutional accountability assessments to understand student learning and program effectiveness. The next layer in the system is district-level leadership. District-level leadership may include central office administrators and the superintendent. Because of their position in the nested system, district-level leaders have the greatest capacity to impact building-level leaders, who can then impact teachers and students. Early in his work on effective schools, Cuban (1984) outlined major policies at the district-level in improving the effectiveness of schools. These policies included:

1. Developing district-wide goals focused on improved student academic performance.
2. Reviewing and modifying promotion policies to align with set goals.
3. Planning at the school level with classroom and school goals that align with district goals.
4. Reviewing and modifying curriculum to align materials and assessments used at the classroom level with the expectations on district and state assessments.
5. Aligning evaluation policies with research on effective teachers and administrators.
6. Developing an overall assessment system that provides information on progress toward classroom, school, and district goals.
7. Providing professional development at all levels in the educational system on effective assessment procedures. (Cuban, 1984)

In a more recent review of research, Leithwood (2010) found that districts that have had success in closing the achievement gap focused on student achievement, showed evidence of planning, aligned curriculum, instruction, teaching resources, and assessments at all levels, and provided professional development for teachers and leaders across the district. Fur-

thermore, Reeves (2009) found that successful school districts engaged in a constant monitoring and evaluation of progress towards goals as part of the strategic planning process. With that said, district-level leadership's role in the three layers of the nested assessment system is to provide support to school-level administrators in supporting teachers, to monitor program implementation and effectiveness at the district level, and to monitor and address student performance on institutional accountability measures.

Classroom-level assessment. District-level leadership has a role in classroom-based assessment systems. In some cases district-level leaders such as curriculum specialists may work directly with teachers and therefore must possess knowledge and skills related to classroom-based assessment. Effective school districts develop policies and approaches to assessment in the classroom which include: valuing assessment in the classroom, setting expectations on how assessments are to be developed and used in the classroom, and determining how grading will occur (Nolen, 2011). In addition, district-level leadership recognizes the need for professional development for teachers, building-level leaders, and district-level leaders in the area of assessment. In a review of 21 high-performing school districts, Leithwood (2010) found that all 21 districts provided targeted and ongoing professional development.

Program-level assessment. In evaluating educational programs, school district-level leadership plays an important role. In a study on the use of data at the school and district levels, Anderson, Leithwood, and Strauss (2010) found:

> District leader actions influencing data use by principals and teachers include modeling data-informed decision making, setting and monitoring expectations for data use, providing tools to assist with data collection and interpretation, and providing or developing expertise to support data use at the school level. (p. 310)

District-level leadership can be a support or a hindrance to the evaluation of school programs, both at the school and district levels. Research about effective school districts indicates that schools and those within the district need access to data, need to know how to use the data to make programmatic decisions, and value the use of assessment data at all levels of the system (Anderson, Leithwood, & Strauss, 2010; Reeves, 2009).

Institutional accountability/policy-level assessment. State accountability assessment systems have influenced how school districts and schools use data to providing information both about individual student learning and program-level assessments. Much of a district's approach to the institutional accountability assessments is driven by the state education agency and the efforts to support district use of standardized assessment data (Anderson et al., 2010). However, school districts also play a role in

how resources are used within the school district. Similar to program-level assessments, teachers, school-level, and district-level leaders need training in how to understand, interpret, and use state accountability assessment data. District-level leaders must know how to provide professional development to teachers and leaders and when this professional development is necessary.

ASSESSMENT LEADERSHIP: LEADING FOR CHANGE

Assessment leadership is not about leading assessment for assessment's sake. It is about seeing how assessment fits into the broader picture of teaching and learning and bringing about educational change at any level in the educational system. Fullan (2006) calls for "system thinkers in action" (p. 113). He indicates that systems thinkers "work intensely in their own schools or districts or other levels, and at the same time connect with and participate in the broader picture" (p. 114). It is about systems and organizations that learn. Senge et al. (2012) posited, "institutions of learning can be designed and run as learning organizations" (p. 23). Learning and change are intricately related. A definition for learning is "a relatively permanent *change* [emphasis added] in knowledge, skills, and/or dispositions precipitated by planned or unplanned experiences, events, activities, or interventions" (Gareis & Grant, 2008, p. 193). Although this definition was developed for thinking about student learning, the same definition can apply to learning organizations. Inherent in this definition and those of a learning organization is the idea that we have an understanding of *what* we have learned and how to make changes based on what we have learned. Therefore, a core element to a learning organization is the use of assessments to continue to learn and to change.

Senge et al. (2012) provide key principles or ideas for learning organizations. First, an organization is a result of how people within the organization interact with one another and how they think (Senge et al., 2012). In applying these key principles to the idea of assessment leadership as systems thinking, a leader recognizes that people have knowledge, skills, and dispositions related to assessment and these vary across the organization. In my work with school districts and schools, I have seen teachers and leaders who embrace assessment and others who loathe it. I have seen teachers and leaders who understand how to interpret scale scores and others who make erroneous inferences based on scale scores. Therefore, an assessment system in any organization is impacted by what teachers, leaders, parents, students, and the community understand about assessment and how they think about it. Second, learning involves making connections. Senge et al. (2012) stated that "fields of knowledge do not exist separately from

each other, nor do they exist separately from the people who study them" (p. 80). The same can be said for assessment. The assessment system must be considered in light of the overall context within which the system resides. Similar to Angyal's (1969) discussion of the differences between relations and systems, Senge et al. (2012) caution against abstraction—that is, thinking that meaning can be found in a single piece of information. In the case of an assessment system, the same applies to a single piece of assessment data. Any assessment's meaning must be considered in relation to its place in the system. Finally, learning in an organization must have a forward-oriented purpose. What is the vision that people in an organization share and what are our individual aspirations? How do we use assessment information to help us move toward the collective vision and the individual ones? In the previous section, assessment leadership was examined through the open, nested systems lens, in terms of what leaders at different levels need to know and be able to do when considering classroom-level assessments, program-level assessments, and institutional accountability or policy-level assessments. To summarize assessment leadership from a systems thinking perspective, this chapter ends with some broad knowledge, skills, and dispositions that educational leaders should have at any level in the nested, open system that characterizes public education.

1. *The assessment leader understands basic tenets and principles of sound assessment practices* to include classroom-level assessments, program-level assessments, and institutional accountability/policy-level assessments. This is often referred to as assessment literacy (Stiggins & Duke, 2008).
2. *The assessment leader sees assessment as a system.* As noted earlier in the chapter, a system is one in which the elements of the system must be considered in light of their place in the system. For example, at the classroom level, what place in the system does a daily formative assessment have in the overall classroom-level assessment system? At the district level, what place do interim benchmarks have in the overall evaluation of educational programs?
3. *The assessment leader understands that assessment systems are systems within systems and how each nested system relates to other systems.* Table 2.3 provides a summary of different assessments and the role they play in the overall assessment system. An assessment leader understands the layered complexity of classroom-level assessment, program-level assessment, and institutional accountability/policy-level assessments and how they make up the overall "assessment system" within their school or within the school district. It would be wise for schools and school districts to conceptually map assessments given at each nested level of the system. Recently, calls have been made for the

development of balanced assessment systems, indicating a move away from over-reliance on state standardized achievement assessments and toward multiple assessments given at multiple levels (National Association of State Boards of Education, 2009). This move necessitates an understanding of how all of these assessments fit within the assessment system.

4. *The assessment leader understands the purpose of the assessment system within the broader educational system.* The assessment system is a system within a system. Considering assessment data alone, without considering other factors like curriculum, instruction, student prior achievement, as well as many others, challenges the validity of inferences that are made based on assessment results at any level in the system (National Association of State Boards of Education, 2009; Shepard, 2009). Figure 2.2 provides an example of this argument. If district-level interim assessments, for example, are not aligned to state standards, then appropriate inferences cannot be made about how students are performing with respect to state expectations.
5. *The assessment leader advocates for a culture of inquiry in which assessment is valued and used to make improvements at the classroom, school, and school system levels*. This is the *leadership* element of assessment leadership. A school-level or district-level leader might have knowledge and skills related to assessment literacy, might "see" assessment as a system, but might not be able to lead the organization in using assessment data to improve teaching and learning at all levels in the organization. Howard Gardner (2010) defines leadership as "an individual (or, rarely, a set of individuals) who significantly affects the thoughts, feelings, and/or behaviors of a significant number of individuals" (p. xiii). In two studies on principals' perceptions regarding assessment, both found that the highest rated behavior of principals was to develop a positive culture around assessment (Hellston et al., 2013; Ulmer, 2002). The culture and leadership surrounding assessment can influence whether teachers, building-level leaders, and district-level leaders view assessment as a way of continuing to learn and improve or view assessment as merely an accountability lever (Anderson et al., 2010). Note Howard Gardner's (2010) definition of leadership and its application to assessment leadership. A leader who continually focuses on assessment merely for accountability will affect the thoughts, feelings, and/or behaviors of others in a negative way. Conversely, a leader who advocates for assessment as a tool for continued learning and improvement throughout all levels in the organization can have a more positive effect on the thoughts, feelings, and/or behaviors of others.

In summary, assessment leadership is as complex as assessment systems. In complex systems, decisions are rarely easy and causal relationships among elements in a system are difficult to establish. As Razik and Swanson (2010) stated, even systems that follow "relatively simple rules of behavior can produce emergent complexity and unpredictable behavior" (p. 35). Therefore, educational leaders at all levels in the educational system must understand that assessment is a nested, open system within a broader nested, open educational system that can be impacted by both internal and external forces. Leaders must take care in interpreting information and making inferences that are appropriate while understanding the caution with which any interpretation must be made.

REFERENCES

Abrams, L. M., Pedulla, J. J., & Madaus, G. F. (2003). Views from the classroom: Teachers' opinions of statewide testing programs. *Theory into Practice, 42*(1), 18–29.

American Association of School Administrators, National Association of Elementary School Principals, National Association of Secondary School Principals, National Council on Measurement in Education. (1997). *Competency standards in student assessment for educational administrators*. Washington, DC: Author.

American Educational Research Association, American Psychological Association, & National Council of Measurement in Education (1985). *Standards for educational and psychological testing*. Washington, DC: AERA.

American Federation of Teachers, National Council on Measurement in Education, & National Education Association. (1990). *Standards for teacher competence in educational assessment of students*. Washington, DC: Author.

Anderson, S., Leithwood, K., & Strauss, T. (2010). Leading data use in schools: Organizational conditions and practices at the school and district levels. *Leadership and Policy in Schools, 9*, 292–327. doi:10.1080/15700761003731492

Angyal, A. (1969). A logic of systems. In E. Emery (Ed.), *Systems thinking* (pp. 17–39). Baltimore, MD: Penguin Books.

Black, P., & Wiliam, D. (1998). Inside the black box. Raising standards through classroom assessment. *Phi Delta Kappan, 80*(2), 139–144.

Cawelti, G. (2004). *Handbook of research on improving student achievement*. Arlington, VA: Educational Research Service.

Center for Education Policy. (2012, December). *State high school exit exams: A policy in transition*. Washington, DC: Author. Retrieved from http://www.cep-dc.org/displayDocument.cfm?DocumentID=408

Center for Education Policy. (2014). *Waiver watch*. Retrieved from http://www.cep-dc.org/index.cfm?DocumentSubTopicID=48

Conley, D. T. (2014). *The common core state standards: Insight into their development and purpose*. Washington, DC: Council of Chief State School Officers. Retrieved from http://www.ccsso.org/Documents/2014/CCSS_Insight_Into_Development_2014.pdf

Council of Chief State Schools Officers. (2008). *Educational leadership policy standards: ISLLC 2008*. Washington, DC: Author. Retrieved from http://www.ccsso.org/Documents/2008/Educational_Leadership_Policy_Standards_2008.pdf

Council of Chief State School Officers. 2011. *InTASC model core teaching standards: A resource for state dialogue*. Washington, DC: Author.

Council of Chief State Schools Officers. (2014). *2014 ISLLC Standards for public comment*. Washington, DC: Author.

Cuban, L. (1984). Transforming a frog into a prince: Effective schools research, policy, and practice at the district level. *Harvard Educational Review, 54*(2), 129–151.

Darling-Hammond, L., LaPointe, M., Meyerson, D., Orr, M. T., & Cohen, C. (2007). *Preparing school leaders for a changing world: Lessons from exemplary leadership development programs*. New York, NY: The Wallace Foundation.

DiPaola, M. F., & Hoy, W. K. (2014). *Improving instruction through supervision, evaluation, and professional development*. Charlotte, NC: Information Age.

Education Week Research Center. (2014). *District disruption and revival: School systems reshape to compete and improve*. Bethesda, MD: Editorial Projects in Education.

Farkas, S., Johnson, J., & Duffett, A. (2003). *Rolling up their sleeves: Superintendents and principals talk about what's needed to fix public schools*. New York, NY: Wallace Foundation.

Florian, J. (2000). *Sustaining education reforms: Influential factors*. Aurora, CO: McRel.

Frey, N. & Fisher, D. (2009). Using common formative assessments as a source of professional development in an urban American elementary school. *Teaching & Teacher Education, 25*(5), 674–680.

Fuchs, L.S., & Fuchs, D. (1986). Effects of systematic formative evaluation: A meta-analysis. *Exceptional Children, 53*(3), 199–208.

Fullan, M. (2006). The future of educational change: systems thinkers in action. *Journal of Educational Change, 7*, 113–122.

Gardner, H. (2010). *Leading minds: An anatomy of leadership*. New York, NY: Basic Books.

Gareis, C. R., & Grant, L. W. (2008). *Teacher-made assessments: How to connect curriculum, instruction, and student learning*. New York, NY: Routledge Eye on Education.

Glatthorn, A. A., Boschee, F., Whitehead, B. M., & Boschee, B. F. (2012). *Curriculum leadership: Strategies for development and implementation* (3rd ed.). Thousand Oaks, CA: Sage.

Grant, L. W., & Gareis, C. R. (2014). Formative assessment. In L. Meyer (Ed.). *Oxford Bibliographies in Education*. New York, NY: Oxford University Press.

Hallinger, P., & Heck, R. H. (1996). Reassessing the principal's role in school effectiveness: A review of empirical research. *Educational Administration Quarterly, 32*(1), 5.

Hamilton, L. S., Stecher, B. M., & Yuan, K. (2008). *Standards-based reform in the United States: History, research, and future directions*. Santa Monica, CA: RAND. Retrieved from http://www.rand.org/content/dam/rand/pubs/reprints/2009/RAND_RP1384.pdf

Hellston, L. M., Noonan, B., Preston, J. P., & Prytula, M. P. (2013). Principals' perceptions of assessment leadership: A study of the assessment practices of

school principals in Saskatchewan (Canada). *International Studies in Educational Administration, 40*(3), 57–74.

Hoy, A. W., & Hoy, W. K. (2013). *Instructional leadership: A research-based guide to learning in schools.* Boston, MA: Pearson.

Husen, T. (Ed.). (1967). *International study of achievement in mathematics* (Vol. I). New York, NY: Wiley.

Jason, M. H. (2008). *Evaluating programs to increase student achievement.* Thousand Oaks, CA: Corwin.

Joint Committee on Standards for Educational Evaluation. (1981). *The program evaluation standards.* Thousand Oaks, CA: Corwin.

Joint Committee on Standards for Educational Evaluation. (2003). *The student evaluation standards: How to improve evaluation of students.* Thousand Oaks, CA: Corwin.

Kahl, S. R., Hofman, P., & Bryant, S. (2013). *Assessment literacy standards and performance measures for teacher candidates and practicing teachers.* Dover, NH: Measured Progress.

Kingston, N., & Nash, B. (2011). Formative assessment: A meta-analysis and a call for research. *Educational Measurement: Issues and Practice, 30*(4), 28–37.

Leithwood, K. (2010). Characteristics of school districts that are exceptionally effective in closing the achievement gap. *Leadership and Policy in Schools, 9,* 245–291.

Leithwood, K., Louis, K.S., Anderson, S., & Wahlstrom, K. (2004). *How leadership influences student learning. Review of research*. Retrieved from www.wallacefoundation.org

Loveless, T. (2012). *How well are American students learning? A 2012 Brown Center report on American education.* Washington, DC: Brookings Institution.

Marzano, R. J., Waters, T., & McNulty, B. A. (2005). *School leadership that works: From research to results*. Alexandria, VA: Association for Supervision and Curriculum Development.

McMillan, J. H. (2011). *Classroom assessment: Principles and practice for effective standards-based instruction* (5th ed.). Boston, MA: Pearson.

McMillan, J. H., Venable, J. C., & Varier, D. (2013). Studies of the effect of formative assessment on student achievement: So much more is needed. *Practical Assessment, Research, & Evaluation, 18*(2), 1–15.

National Association of State Boards of Education. (2009). *The report of the NASBE study group on assessment systems for the 21st century learner.* Arlington, VA: Author. Retrieved from http://www.nasbe.org/wp-content/uploads/SG_Assessment_Report_2009.pdf

National Board for Professional Teaching Standards. (1989). *What teachers should know and be able to do.* Arlington, VA: Author.

National Center for Education Statistics. (2011). *National Assessment of Educational Progress.* Washington DC: Author. Retrieved from http://nces.ed.gov/nationsreportcard/

No Child Left Behind Act, 20 U.S.C. § 6301 (2002)

Nolen, S. B. (2011). The role of educational systems in the link between formative assessment and motivation. *Theory Into Practice, 50*, 319–326.

Organisation for Economic and Co-operative Development (OECD). (2013). *Programme for international student assessment (PISA) results from PISA 2012: Country note.* Paris, France: Author. Retrieved from http://www.oecd.org/unitedstates/PISA-2012-results-US.pdf

Perie, M., Marion, S., & Gong, B. (2009). Moving toward a comprehensive assessment system: A framework for considering interim assessments. *Educational Measurement: Issues and Practice, 28*(3), 5–13.

Popham, W. J. (2014). *Classroom assessment: What teachers need to know* (7th ed.). Boston, MA: Pearson.

Razik, T. A., & Swanson, A.D. (2010). *Fundamental concepts of educational leadership and management.* Boston, MA: Pearson.

Reeves, D. B. (2009). *Leading change in your school: How to conquer myths, build commitment, and get results.* Alexandria, VA: Association for Supervision and Curriculum Development.

Reeves, P. L., & Burt, W. L. (2006). Challenges in data-based decision-making: Voices from principals. *Educational Horizons, 85*(1), 65–71.

Robelson, E. W. (2012, March 27). More states retaining struggling 3rd graders, *Education Week*. Retrieved http://www.edweek.org/ew/articles/2012/03/28/26retention_ep.h31.html

Robinson, V. M. J., Lloyd, C. A., & Rowe, K. J., (2008). The impact of leadership on student outcomes: An analysis of the differential effects of leadership types. *Educational Administration Quarterly, 44*(5), 635–674.

Russell, M. K., & Airasian, P. W. (2012). *Classroom assessment: Concept and applications* (7th ed.). New York, NY: McGraw-Hill.

Sanders, J. R., & Sullins, C. D. (2005). *Evaluating school programs: An educator's guide* (3rd ed.). Thousand Oaks, CA: Corwin Press.

Senge, P., Cambron-McCabe, N., Lucas, T., Smith, B., Dutton, J., & Kleiner, A. (2012). *Schools that learn: A fifth discipline fieldbook for educator's parents, and everyone who cares about education,* New York, NY: Crown.

Shepard, L. (2009). Commentary: Evaluating the validity of formative interim assessment. *Educational Measurement: Issues and Practice, 28*(3), 32–37.

Slavin, R. E., Cheung, A., Holmes, G., Madden, N., & Chamberlain, A. (2013). Effects of data-driven district reform model on state assessment outcomes. *American Educational Research Journal, 50*(2), 371–396. doi:10.3102/0002831212466909

Snipes, J., Doolittle, F., & Herlihy, C. (2002). *Foundations for success: Case studies of how urban school systems improve student achievement.* New York, NY: MDRC.

Stein, M. K., & Nelson, B. S. (2003). Leadership content knowledge. *Educational Evaluation and Policy Analysis, 25*(4), 423–448.

Stiggins, R., & Duke, D. (2008). Effective instructional leadership requires assessment leadership. *Phi Delta Kappan, 94*(1), 285–291.

Supovitz, J., Sirinides, P., & May, H. (2010). How principals and peers influence teaching and learning. *Education Administration Quarterly, 46*(1), 23–28. doi:10.1177/1094670509353043

Ulmer, M. (2002). *Principals' leadership practices in the context of state assessments*. Retrieved from ProQuest. (3050209)

Von Bertalanffy, L. (1968). *General systems theory.* New York, NY: George Braziller.

CHAPTER 3

SERVANT LEADERSHIP AND ORGANIZATIONAL CITIZENSHIP BEHAVIOR

Predictors of Climate

David L. Dixon

ABSTRACT

This study examined the relationship between servant leadership of the principal with Organizational Citizenship Behavior (OCB) and school climate. Servant leadership, a leadership behavior that emphasizes personal growth of followers, has a useful research history in business but limited exposure in public schools. Organizational Citizenship Behavior (OCB) is an organizational construct that describes noncontractual behaviors of workers that contribute to the success of the organization. These relationships in turn foster organizational citizenship behaviors within the school and provide an open/healthy school environment.

Leadership and School Quality, pp. 47–59

This study utilized data gathered from 708 participants within a random sample of 41 public high schools in Alabama. Three reliable instruments were used in this study: Servant Leadership Survey (SLS), Organizational Climate Index (OCI), Organizational Citizenship Behavior Scale (OCB Scale).

The first hypothesis of the study tested the relationship of servant leadership with OCB and school climate. The findings supported a previous study that servant leadership behaviors of the principal are significantly related to the school climate. As servant leadership behaviors increase the climate of the school improves. Findings also reveal that servant leadership behaviors are significantly related to the OCB within the school. As servant leadership behaviors increase the level of OCB within the school rises.

The second hypothesis of the study tested the predictability of servant leadership and OCB on the perceived school climate. Regression analysis results identified OCB as the greater predictor of school climate. Further examination of the servant leadership and OCB with each climate dimension provided a more comprehensive examination of the relationships. OCB was found to be a greater predictor of collegial leadership and professional teacher behavior than servant leadership. Surprisingly, results of the analysis revealed socioeconomic status (SES) was the greater predictor of the academic press and environmental press within the school climate than servant leadership.

Servant leadership is a behavior that simultaneously meets personal and organizational needs. Drawing on a norm of reciprocity, that is, "you scratch my back," it seems reasonable to argue that servant leadership will engender organizational citizenship and improve organizational climate. Organizational citizenship, which is behavior that is noncompensated and goes beyond the stated responsibilities of a role, is the other side of servant leadership. People are probably willing to go beyond the demands of a job itself when they see a leader genuinely interested in their welfare as well as the welfare of the organization. As incidents of servant leadership and organizational citizenship increase, I argue that school climate will improve. The test of the argument, as will be explicated in this article, supports the contention that the concepts are strongly related.

CONCEPTUAL FRAMEWORK

In this section I will give a brief history of the central concepts of the study and an explanation of how they fit together. We will start with servant leadership, a research concept in need of being clarified, and then move on to organizational citizenship and school climate.

Servant Leadership

The history of servant leadership owes a great a deal to Robert Greenleaf (1970), who argued that a great leader is one who serves followers. Greenleaf was inspired by a character in Herman Hesse's (1956) short story, *Journey to the East*. The story, which tells of an arduous spiritual journey, focuses on all the many things one character, Leo, did to ease the travels of everyone else—although those characters are never conscious of Leo's contributions. It was only after Leo left that the company realized their dependence upon the servant. Greenleaf argues that the servant was in fact the leader because his efforts moved the group towards its goal while satisfying the needs of individual members. Using Leo's behavior as a model, Greenleaf presents a theory of servant leadership for organizations.

Greenleaf's student, Spears (1995), did much to clarify servant leadership. He developed 10 characteristics of servant leadership that included such behaviors as listening, empathy, and commitment to the growth of people (Spears, 1995). Then, Laub (1999) further specified the concept and operationalized it into six dimensions. Laub's research shows the usefulness of linking servant leadership to other organizational properties in business, religion, and educational organizations. Also influenced by Spears, Van Dierendonck and Nuijten (2011) developed a reliable instrument to measure servant leadership.

While there have been no important changes in Greenleaf's (1970) understanding of the concept, different operational definitions have emphasized religious or spiritual views. This study follows the track from Greenleaf, to Spears (1995), to Dierendonck and Nuijten (2011), because of the consistent treatment of the concept and the reliability of the measure.

Organizational Citizenship

The term Organizational Citizenship Behavior (OCB), first used by Bateman and Organ (1983), describes the unsolicited behaviors of workers who assist others in accomplishing the task at hand. These behaviors are performed by workers with acknowledgment that such work is noncontractual and not recognized by the organization's formal reward system. These extra-role activities are generally beneficial to the overall effectiveness of the organization.

Bateman and Organ (1983) proposed a construct consisting of two dimensions: altruism and generalized compliance. Altruism may be defined as those helping behaviors of an individual worker that are directed toward specific coworkers within the organization. Generalized compliance can be described as unsolicited worker behaviors that promote organizational

objectives. The construct, although grounded in business settings, was first brought into a school environment by DiPaola and Tschannen-Moran (2001). Although they found the two dimensions proposed by Bateman and Organ (1983), they argued the two dimensions formed a one dimension bipolar construct (DiPaola & Tschannen-Moran, 2001). Building on previous research, DiPaola, Tarter, and Hoy (2005) developed a reliable instrument, the Organizational Citizenship Behavior Scale (OCB Scale), that encompassed elementary, middle, and high schools. Our study used the OCB Scale because of its high reliability and its acceptance within the educational research community.

School Climate

Workers' perception of their work environment has long been a thread within the fabric of organizations and can be found in both educational and noneducational settings. The history of the work environment is important determining the longevity and productivity of the workers. In a similar fashion, the history of interactions affects the climate.

Halpin and Croft (1963) were pioneers in applying the construct of perceived work environments or climates to an educational setting. They argued that each school had a personality that could be measured on a single continuum ranging from open to closed (Halpin & Croft, 1963). An open school could be defined as one containing goal-focused member relationships that were engaging, supportive, and collaborative (Halpin & Croft, 1963). Through the years this open school/closed school construct has been refined to include all levels of schools as well as a deeper examination of teacher and principal behaviors.

School climate has also been examined through a perspective of organizational health (Hoy, 1991), which has its roots within Parsonian social systems theories. Using Parson's perspective, Hoy and Feldman (1987) operatized school health in a secondary school setting. Further studies added to the literature by applying the construct to the elementary and middle schools.

Although climate has been viewed through two lenses, openness and health, there is commonality between the two. Hoy, Smith, and Sweetland (2002) combined the overarching themes of *personality* and *health* found within the two constructs. Through a second order factor analysis of the measures, they reduced the number of subtests to four: collegial leadership, professional teacher behavior, achievement press, and environment press (Hoy et al., 2002). Taken together, these four subtests comprise the Organizational Climate Index (OCI). This study used the OCI because of the internal consistency of the measure and its conceptual integrity.

THEORY AND HYPOTHESES

This study was driven by two questions: (a) What is the relationship of servant leadership to organizational citizenship and school climate? (b) Is there is a specific order to the relationship of these variables?

Logic suggests that these variables are related. Altruistic behaviors emerge as a mutual theme in both servant leadership and organizational citizenship (Barbuto & Wheeler, 2006; Dennis & Bocarnea, 2005). Interactions between the servant leader and the teacher establish positive and authentic relationships because the leader is recognized as committed to the personal and professional needs of the faculty (Cerit, 2009; Taylor, Martin, Hutchinson, & Jinks, 2007). Within the framework of social exchange, teachers reciprocate and promote behaviors that go beyond the strict demands of their roles (Ehrhart, 2004). In return for the support of the principal, teachers find a way to promote the work of their colleagues and the school in general (Somech & Ron, 2007).

The behavior of the principal and the faculty, captured as servant leadership and organizational leadership respectively, bring together two potent players whose aim is to promote the openness and health of the school.

In this study climate is conceptualized as possessing collegial leadership, teacher professional behavior, academic emphasis, and environmental press. Given that the behaviors of the servant leader embody the general thrust of the leader-as-colleague, one would reasonably expect collegial leadership as an element of climate to be related (Black, 2010; DiPaola & Tschannen-Moran, 2001). Similarly, if servant leadership elicits organizational citizenship on the part of the faculty, and the work of the faculty is to provide instruction, we should see a correlation between servant leadership and professional teacher behavior (Ehrhart, 2004; Hoy et al., 2002). One of the functions of collegial leadership and professional teacher behavior is to improve the academic emphasis of the school (Hoy et al., 2002). It does not seem reasonable to propose that behaviors within the school will illicit environmental press; nonetheless, taking climate as the sum of its elements, the general construct should be related to both organizational citizenship and servant leadership (Somech & Ron 2007). The test of this theoretical explanation is expressed in the following hypotheses:

H1: There is a positive correlation between Servant Leadership, OCB, and school climate.

While questions of causation are potentially vexatious, servant leadership should anticipate climate; it does not seem that any particular climate would predict servant leadership. Moreover given the argument in the

preceding paragraph, organizational citizenship should be a predictor of climate. The theoretical question is which of these two would be a greater predictor of climate. We opted for the explanation that servant leadership would make a greater contribution to school climate because leadership would have both a direct effect on school climate and an indirect effect through organizational citizenship. Citizenship, we argued, has a more immediate connection to climate that is not as pervasive as leadership (as will be seen in the results section, our prediction is not borne out). In any event, to test the theory that leadership would be a greater predictor of climate than citizenship, we proposed the following:

H2: Servant leadership makes a greater contribution to school climate than OCB.

METHOD

Sample

The sample for this study consisted of a convenience sample of 728 teachers from 41 public high schools in Alabama, drawn from rural and suburban settings. All participants within the study were full-time teachers, guidance counselors, and library media specialists. Participation in this study was voluntary, anonymous, and confidential. Data were collected by the library media specialists at each school during a regularly scheduled faculty meeting. Participating teachers received one of three surveys, two of which were used for the study.

Measures

Servant Leadership. For this study, servant leadership of the principal was measured by the Servant Leadership Survey (SLS), which measures eight dimensions of leadership identified by Van Dierendonck and Nuijten (2011). These dimensions include empowerment, accountability, standing back, humility, authenticity, courage, interpersonal acceptance and stewardship. The SLS is a 30-item survey assessed along a 6-point Likert-type scale. This scale ranges from 1 (strongly disagree) to 6 (strongly agree) and has a reliability that ranges from .69 to .91. For the purposes of this study, the word *manager* was replaced with the word *principal* within the questions of the survey. Sample questions from the survey include: “My principal

takes risks and does what needs to be done in his/her view," "My principal keeps himself/herself in the background and gives credits to others," and "My principal gives me the authority to take decisions which make work easier for me."

School Climate. The OCI, based on the work of Hoy et al. (2002), was used to assess school climate for this study. The OCI is a 27-item questionnaire that measures four critical areas of school climate in terms of openness and health: collegial leadership, professional teacher behavior, achievement press, and environmental press. The OCI is a 27-item survey assessed along a 6-point Likert-type scale. This scale ranges from 1 (strongly disagree) to 6 (strongly agree) and has a high reliability that ranges from .87 to .94.

Organizational Citizenship Behavior. The OCB Scale was used to measure OCB for this study. The OCB Scale, developed by DiPaola et al. (2005), is a 12-item Likert-type scale that measures the degree to which the teacher of a school engages in organizational citizenship behavior. The OCB Scale is a refinement of the earlier OCB Scale (DiPaola & Tschannen-Moran, 2001) and has a correlation of .97 to the previous version. The Likert-type instrument was measured along a 6-point scale that ranges from 1 (strongly disagree) to 6 (strongly agree) and has reliabilities ranging from .86 to .93.

RESULTS

Descriptive Statistics

All of the survey instruments administered in this study contained standard respondent demographic questions. The responses were aggregated to the school level and are presented in Table 3.1. All variables for this study have been aggregated to the school level. Descriptive statistics for the research variables are provided in Table 3.1. The statistics include the number of sample schools (*N*), mean (*M*), standard deviation (*SD*), variance (V), and the low and high scores. Data were aggregated at the school level. The mean scores for the variables SL, OCB, and OCI were calculated first by aggregating all teacher responses to the school level and then calculating means. School means were then used to calculate an overall mean for each variable. The overall mean scores for socioeconomic status (SES) are the results of the mean SES from each of the 41 schools who participated, as measured by the percentage of students enrolled in the Free and Reduced Lunch Program.

Table 3.1. Descriptive Statistics for the Research Variables

Variable	*M*	*SD*	*Low*	*High*
SL	4.65	.70	2.84	5.53
OCB	4.27	.50	1.68	4.89
OCI	4.64	.29	1.80	3.37
SES	53.96	19.11	19.00	100.00

Reliability and Correlational Analysis

Three measurements within the survey instruments were tested individually to ensure consistent internal reliability. Muijs (2006) proposes that instruments that have a Cronbach's coefficient alpha of .70 or greater may be deemed reliable. Because the unit of analysis was the school, reliability for each instrument was tested using the aggregate score of the school. Reliability coefficients were acceptable: SLS (.98), OCB Scale (.90) and OCI (.85) (see Table 3.2).

Table 3.2. Alpha Coefficients of Reliability Using School as Unit of Analysis (*N* = 41)

Variable	*Instrument*	*Number of Items*	*Cronbach's Alpha*	*N*
Servant Leadership	SLS	30	0.98	41
OCB	OCB Scale	12	0.90	41
School Climate	OCI	30	0.85	41

In order to gain a greater understanding of the school climate, further analysis was performed on the four subtests found within the OCI. The subtests included Collegial Leadership (CL), Professional Teacher Behavior (PTB), Academic Press (AP), and Environmental Press (EP). Given the reliability of the OCI, it was not surprising that each subtest was reliable. Results of the analysis reveal the reliability for each subtests four within school climate: CL (.89), PTB (.88), AP (.83), and EP (.77).

The first hypothesis was supported: servant leadership, climate, and organizational citizenship were correlated (see Table 3.3). First, as the servant leadership behaviors of the principal increased, teacher OCB

increased ($r = .64$, $p < .01$). Second, an increase in the servant leadership behaviors of the principal resulted in a school climate that was more open and healthy ($r = .57$, $p < .01$). Further investigations found significant relationships between servant leadership with: collegial leadership ($r = .67$, $p < .01$); professional teacher behavior ($r = .49$, $p < .01$); and academic press ($r = .22$, $p < .01$). Servant leadership (SL) had the strongest correlations with collegial leadership (CL) and OCB. There was a moderate relationship between servant leadership (SL) and professional teacher behavior (PTB). Academic press (AP) and SES were found to have a weak correlation with servant leadership. There was no significant correlation found between servant leadership (SL) and environmental press (EP).

Table 3.3. Intercorrelational Matrix of Research Variables

	SLS	*OCB*	*OCI*	*CL*	*PTB*	*AP*	*EP*	*SES*
SLS		.638**	.573**	.676**	.488**	.215**	-0.008	.114*
OCB			.573**	.680**	.693**	.172**	-.175**	0.068
OCI				.805**	.747**	.725**	.317**	.373**
CL					.655**	.328**	-0.035	0.05
PTB						.306**	-0.058	.090*
AP							.230**	.514**
EP								.417**
SES								

Note. $**p < .01$, $*p < .05$

SL = Servant Leadership; OCB = Citizenship Behavior; OCI = School Climate; CL = Collegial Leadership; PTB = Professional Teacher Behavior; AP = Academic Press; EP = Environmental Press; SES = Socioeconomic Status.

The second hypothesis proposed that Servant Leadership would make a greater contribution to school climate than OCB. Surprisingly, initial results suggested SL and OCB made an equal contribution to school climate; the zero-order correlations showed nearly identical relationships between servant leadership and school climate ($r = .57$, $p < .01$) as well as OCB and school climate ($r = .57$, $p < .01$).

Contrary to the hypothesis, organizational citizenship ($\beta = .531$, $p < .01$) had a greater influence on climate than servant leadership ($\beta = .201$, $p < .01$). Although not hypothesized, SES ($\beta = .264$, $p < .01$) had a greater influence than servant leadership (see Table 3.4).

Table 3.4. Regression of School Climate on Servant Leadership, Organizational Citizens, and SES

Dependent Variable: School Climate	*r*	*B*	β
Predictor Variables			
SL	.57	.099	.201**
OCB	.57	.306	.531**
SES	.37	.005	.264**

Note. **$p < .01$, $R^2 = .554$**, Adjusted $R^2 = .550$**

DISCUSSION

This study extends the literature of servant leadership by considering its relationship to OCB and school climate. The underlying theory proposed that the social reciprocity fostered by servant leadership behaviors of the principal would promote higher levels of OCB among the faculty and an open/healthy school climate. That is, servant leadership would be the thread to reinforce the fabric of the organizational life of the school.

First, this study confirmed that servant leader principals do promote and foster the OCB of their teachers. This was anticipated because servant leadership and OCB are both linked by common altruistic underpinnings. Many individuals go into teaching and likely seek the principalship more for the advocacy of the young rather than financial gain or status. A servant leader principal goes beyond traditional practices by providing support for the emotional and social needs of the teacher. This study corroborates an earlier study suggesting the supervisor support is a facilitator as well as an antecedent, to teacher OCB (Somech & Ron, 2007). The authentic behavior of a servant leader principal reduces the anxiety sometimes occasioned by status difference. As these nurturing social exchanges occur, they elicit additional interactions (Cerit, 2009), thus building collaboration and shared leadership between the principal and teacher—the essence of social reciprocity.

As teachers emulate the principal to others, these behaviors may trickle down through the organization, increasing collective OCB (Ehrhart, 2004). In fact Van Direndonck and Nuijten (2011) found a pervasive influence of servant leaders across the organization. In all likelihood, servant leadership increases collective trust within the school (Joseph & Winston, 2005; Sendjaya & Perkerti, 2010).

In line with previous findings (Black, 2010), this study revealed a strong and significant relationship between servant leadership and the school climate. Principals who are attuned to the attributes of servant leadership

provide an atmosphere of openness and support for teachers within the schools. Teachers perceive the working environment to be one in which they are sheltered from negative distractions and free to focus on the educational process of their students. Hoy, Hannum, and Tschannen-Moran (1998) examined school climate and found that open and authentic behaviors by the principals and teachers enhanced the climate of the school. The authentic behavior of a servant leader provides transparency of their motives to their followers. Cerit (2009) found that the authenticity of a servant leader had a profound effect on the job satisfaction of followers and could suggest that servant leader principals retain good teachers and are able to focus their attention on other matters, rather than the process of hiring new teachers. Explorations of the relationship between servant leadership and the four dimensions found in the School Climate Index revealed a strong relationship between servant leadership and collegial leadership. Hoy et al. (2002) defines collegial leadership as openness of the behavior of the principal within the school. It is no surprise that the characteristics of a servant leader principal provide interactions and communications with teachers that are open and authentic. A servant leader principal engages in honest and productive dialogs with teachers. This open relationship between leader and follower promotes problem solving which may increase the effectiveness of the processes found in schools.

Contrary to the hypothesized relationship, OCB had a greater effect on climate than servant leadership and was a stronger predictor of climate than servant leadership. The initial rationale of the servant leadership and OCI relationship was that servant leader principals would be new to school organizations that had low levels of citizenship and climate. These servant-leader principals would turn the school around. Our theory apparently did not give sufficient weight to the existing teacher norms. Taking the existing cadre of teachers into consideration, OCB would have more direct influence on climate than servant leadership, which would be mediated through the informal organization of teachers.

There is empirical support for this interpretation. Over time teachers form strong relationships with their coworkers and those bonds determine the level of trust afforded to a new administrator (Baier, 1985). During a typical school day, for example, the frequency of teacher-teacher interactions is greater than that between teachers and the principal. These interactions lend themselves to a level of collegiality that influences OCB and, ultimately, climate.

The finding that SES made a greater contribution to servant leadership is intriguing. The most likely explanation is that, as district wealth rises, school climate improves independently of servant leadership. But this apparent relationship probably masks a more complex dynamic. As Sirin (2005) found in his SES research, SES is linked to individuals, neighbor-

hoods, and schools. Our study used Free and Reduced Lunch as a surrogate for SES, a substitution that is often criticized. An appropriate next step would be to extend the research at hand into a closer look into the dynamics of neighborhood wealth and school operations.

While trust was not measured in this study, it seems reasonable to argue that servant leadership builds trust, which in turn develops positive social reciprocity that seems inherent in citizenship behavior. Tschannen-Moran (2003) found trust is an important predictor of OCB.

Servant leadership, organizational citizenship, climate and trust are part of a constellation of variables deserving further research. It is doubtless the case that servant leadership and transformational leadership overlap in their direct shaping of the internal environment of the school and their indirect relationship to school effectiveness. The present study, however, establishes a path from servant leadership to citizenship to climate.

REFERENCES

Barbuto, J. E., & Wheeler, D. W. (2006). Scale development and construct clarification of servant leadership. *Group & Organization Management*, *31*(3), 300–326.

Bateman, T., & Organ, D. (1983). Job satisfaction and the good soldier: The relationship between affect and employee citizenship. *Academy of Management Journal*, *26*, 587–595.

Baier, A. (1985). Trust and antitrust. *Ethics*, *96*, 231–260.

Black, G. (2010). Correlational analysis of servant leadership and school climate. *Catholic Education: A Journal of Inquiry and Practice*, *13*(4), 437–466.

Cerit, Y. (2009). The effects of servant leadership behaviors of school principals on teachers' job satisfaction. *Educational Management Administration & Leadership*, *37*(5), 600–623.

Dennis, R., & Bocarnea, M., (2005). Development of the servant leadership assessment instrument. *Leadership & Organizational Development Journal*, *26*(8), 600–615.

DiPaola, M. F., Tarter, C. J., & Hoy, W. K. (2005). Measuring organizational citizenship of schools. In M. F. DiPaola & W. K. Hoy (Eds.), *Essential ideas for the reform of American schools* (pp. 227–250). Charlotte, NC: Information Age Publishing.

DiPaola, M., & Tschannen-Moran, M. (2001). Organizational citizenship behavior in schools and its relationship to school climate. *Journal of School Leadership*, *11*, 424–447.

Ehrhart, M. G. (2004). Leadership and procedural justice climate as antecedents of unit-level organizational citizenship behavior. *Personal Psychology*, *57*(1), 61–94.

Greenleaf, R. K. (1970). *The servant as leader*. Indianapolis, IN: Robert K. Greenleaf Center.

Halpin, A. W., & Croft, D. B. (1963). *The organizational climate of schools*. Chicago, IL: MacMillan.

Hesse, H. (1956). *The journey to the East.* New York, NY: Picador.

Hoy, W. K., Tarter, C. J., & Kottkamp, R. B. (1991). *Open schools/healthy schools: Measuring organizational climate.* Beverly Hills, CA: Sage.

Hoy, W. K., & Feldman, J. A. (1987). Organizational health: The concept and its measure. *Journal of School Leadership, 20,* 30–38.

Hoy, W. K., Hannum, J., & Tschannen-Moran, M. (1998). Organizational climate and student achievement: a parsimonious and longitudinal view. *Journal of School Leadership, 8*, 336–359.

Hoy, W., Smith, P., & Sweetland, S. (2002). The development of the organizational climate index for high schools: Its measure and relationship to faculty trust. *The High School Journal, 86*(2), 38–49.

Joseph, E., & Winston, B. (2005). A correlation of servant leadership, leader trust, and organizational trust. *Leadership & Organization Development Journal*, *26*(1), 6–22.

Laub, J. A. (1999), Assessing the servant organization: Development of the servant organizational leadership assessment (SOLA) instrument. Retrieved from *Dissertation Abstracts International, 60*(2).

Muijs, D. (2006). Measuring teacher effectiveness: Some methodological reflections. *Educational Research and Evaluation, 12*(1), 53–74.

Sendjaya, S., & Pekerti, A. (2010). Servant leadership as an antecedent of trust in organizations. *Leadership & Organization Development Journal, 31*(7), 643–663.

Sirin, S. R. (2005). Socioeconomic status and academic achievement: A meta-analytic review of research. *Review of Educational Research, 75*(3), 417–453.

Somech, A., & Ron, I. (2007). Promoting organizational citizenship behavior in schools: The impact of individual and organizational characteristics. *Educational Administration Quarterly, 43*(1), 38–66.

Spears, L. C. (1995). *Reflections on leadership: How Robert K. Greenleaf's theory of servant leadership influenced today's top management thinkers.* New York, NY: John Wiley.

Tschannen-Moran, M. (2003). Fostering organizational citizenship in schools: Transformational leadership and trust. In W. Hoy & C. Miskel (Eds.), *Studies in leading and organizing schools* (pp. 157–179). Greenwich, CT: Information Age Publishing.

Van Dierendonck, D., & Nuijten, I., (2011). The servant leadership survey: Development and validation of a multidimensional measure. *Journal of Business Psychology, 26*, 249–267.

CHAPTER 4

DIRECT AND INDIRECT EFFECTS OF PRINCIPAL LEADERSHIP ON TEACHER QUALITY AND MATHEMATICS ACHIEVEMENT IN THE CONTEXT OF THE *RESPONSIVE CLASSROOM* APPROACH

Ross A. A. Larsen, Shannon B. Wanless, Sara E. Rimm-Kaufman, and Timothy W. Curby

ABSTRACT

Purpose: In this study, we examine: (a) the direct effect of principal leadership on teacher student interaction quality, (b) the direct effect of teacher-student interaction quality on student mathematics achievement, and (c) the indirect effect of principal leadership on student mathematics achievement via teacher-student interaction quality. These effects are tested in schools randomized to one of two conditions—one in which teachers have been trained

Leadership and School Quality, pp. 61–89

in the *Responsive Classroom* approach and the other in which teachers are using traditional, "business as usual" approaches.
Research Design: We used a multigroup, multilevel structural equation model to test the strength of the direct and indirect relations among principals, teachers, and students at intervention and comparison schools. This randomized controlled trial was conducted in 24 socioeconomically diverse, suburban elementary schools.
Findings: In the intervention group, results showed (a) direct effects between teachers' perceptions of their principal's leadership and teaching quality; (b) direct effects between teaching quality and student mathematics achievement; and (c) indirect effects between teachers' perceptions of their principal's leadership and mathematics achievement. These relationships were not present in the control group schools.
Conclusions and Implications for Research and Practice: The *Responsive-Classroom* approach creates conditions in which principal leadership appears to influence teaching quality, and, in turn, mathematics achievement. One plausible explanation is that the *Responsive Classroom* approach enhances interconnectedness among principals, teachers, and students.

Students in the United States lag behind students in other developed nations in mathematics achievement (Gonzales et al., 2008). Research in the U.S. shows the importance of principal leadership (Hallinger & Heck, 1998; Heck, 2007; Leithwood & Jantzi, 2000; Leithwood, Louis, Anderson, & Wahlstrom, 2004; Leithwood, Patten, &Jantzi, 2010; Marzano, Waters, & McNulty, 2005) and the interactions between teachers and students in the classroom (Borman & Overman, 2004; Pianta, Belsky, Vandergrift, Houts, & Morrison, 2008a) for improving mathematics achievement. Research has not addressed, however, whether interventions aiming to improve principal leadership and teacher-student interactions could ultimately lead to improved student mathematics achievement. This chapter will study the effect of such an intervention, the *Responsive Classroom (RC)* approach, on the relations among principal leadership, observed teacher-student interaction quality, and mathematics achievement.

Principal leadership, including communication with teachers and prioritization of professional development efforts, may affect student mathematics achievement through: (a) a direct link between principal leadership and student mathematics achievement, and (b) an indirect link between principal leadership and student mathematics achievement through teacher-student interactions. The direct effect represents school-wide decisions that affect student mathematics achievement directly; for instance, a principal may set the tone for how much mathematics is emphasized in the school by holding mathematics-oriented assemblies, having mathematics awards, and working directly with students on mathematics learning. The indirect effect represents the way that a

principal's leadership influences the quality of teacher-student interactions in the classroom and then, ultimately, student mathematics achievement. An example of a possible indirect effect might be the principal coordinating with mathematics specialists to promote teams of teachers working together to develop their mathematics teaching skills.

Existing meta-analytic work (Hallinger & Heck, 1998) differentiated between direct and indirect effects of principals on student achievement, based on 43 studies published between 1980–1995. The majority of the studies analyzed found indirect effects, not direct effects, of principal leadership on student mathematics achievement. The indirect effects were measurable and mediated through the teachers or other organizational aspects of the school (e.g., school goals, school structure and social networks, and organizational culture). Hallinger and Heck (1998) suggested that the prevalence of indirect effects might be due to the evolving nature of research. Specifically, the focus of research has shifted away from understanding *if* principals affect student outcomes to understand the *ways* wherein principals affect student outcomes.

Consideration of the presence of direct and indirect effects of principals on student achievement is especially important in the context of interventions targeted to improve social interactions within a school. School-based Social and Emotional Learning (SEL) interventions have become increasingly prevalent in the last decade as schools strive to build social and emotional competencies of children and ultimately decrease existing achievement gaps (Durlak, Weissberg, Dymnicki, Taylor, & Schellinger, 2011; Greenberg, 2010). By definition, SEL interventions are designed to foster effective self-management, self-awareness, social awareness, relationship skills, and responsible decision-making for children and adults (Collaborative for Academic, Social, and Emotional Learning, n.d.). The present study focuses on one SEL intervention, the *RC* approach, designed to improve school-wide practices, school leadership, and classroom practices to foster student learning (Northeast Foundation for Children, 2007). Specifically, we examine the presence of direct and indirect effects among principal leadership, teacher quality, and student achievement in two conditions: one in which teachers and principals are receiving training in a SEL intervention, the *RC* approach; and the other in which principals and teachers are using "business as usual" approaches. The *RC* approach is designed to improve principals' capacity to lead effectively as well asto shift the nature of the interactions that occur within a classroom between teachers and students. The present study extends existing research on SEL (Durlak et al., 2011; Ransford, Greenbeg, Domitrovich, Small, & Jacobson, 2009) by using a randomized controlled trial of the *RC* approach to consider direct and indirect effects of principal leadership on classroom interactions and, ultimately, student achievement.

Principal Leadership

The quality of principal leadership has important implications for improving student achievement (Hallinger& Heck, 1998; Heck, 2007; Leithwood & Jantzi, 2000; Leithwood et al., 2004, 2010; Marzano et al., 2005). Waters et al. (2003) have developed a comprehensive model of school leadership based on meta-analytic work (primarily teacher report), defining effective leadership in relation to 21 responsibilities. Four of these 21 responsibilities describe the nature of principals' interactions with school staff, particularly with teachers, and show the strongest correlation to student achievement outcomes (exceeding .20). These four responsibilities include: communication with teachers and students;creation of a culture of shared beliefs;establishment and prioritization of clear goals, including intellectual stimulation (in relation to professional development efforts); and development and communication of ideals and beliefs to teachers. Based on the comprehensive model of school leadership, we advance the hypothesis that principals indirectly support student mathematics achievement by establishing strong lines of communication, having clear goals, and establishing a culture of shared beliefs that includes an emphasis on professional development.

Studies have measured principal leadership as teachers' perceptions of their principal's leadership abilities (Rinehart, Short, Short, & Eckley, 1998) and found relationships to student achievement (Waters et al., 2003). Considering that teaching is an intensely interpersonal and psychological experience (Rimm-Kaufman & Hamre, 2010) and given the nature of the profession, teachers' perceptions of their experience have important implications for the way that they carry out their day-to-day activities. This research suggests that teachers' perceptions of their principal's leadership may be a useful and valid way of examining relations with student mathematics achievement.

Teacher-Student Interaction Quality and Mathematics Achievement

Increased teacher-student interaction quality, or the relational and instructional interactions between teachers and students, relates to increased student mathematics achievement (Borman & Overman, 2004; Hackenberg, 2010; Hamre & Pianta, 2005; Pianta, Belsky et al., 2008). Specifically, a meta-analysis of 18 studies of teacher-student interaction quality across grades 2–10 found increasing teacher-student interaction quality has a standardized effect size of .35 on student achievement in both mathematics and reading (Nye, Konstantopoulos, & Hedges, 2004).

Thus, student mathematical outcomes are shown to be sensitive to teacher-student interaction quality; thus, any change in teacher-student interaction quality would impact student mathematics outcomes.

Teacher-student interaction quality is comprised of three conceptually distinct, yet statistically correlated domains: emotional support, classroom organization, and instructional support (Pianta, LaParo, & Hamre, 2008). Emotional support includes a positive social climate in the classroom among peers and between teachers and students; teachers' warmth, respect, sensitivity, and responsiveness to students; teachers' anticipation of student problems and emotions; and teachers' demonstrated understanding of students' perspectives. Classroom organization involves teachers' effective proactive behavior management, establishment of clear rules and expectations, use of predominantly proactive approaches to problem behavior, productive use of classroom time, and use of instructional modalities likely to engage students in learning (Cotton, 1995; Pianta et al., 2008). Instructional support is defined as the ability of teachers to monitor their students and provide appropriate feedback through scaffolding, teachers' use of *why* and/or *how* questions to promote understanding, and teachers' requests for students to explain their thinking (Pianta et al., 2008; Westwood, 2008; Yates & Yates, 1990).

The measurement of teacher-student interaction quality and links to student achievement has been bolstered by the development and validation of the Classroom Assessment Scoring System (CLASS) instrument (Pianta et al., 2008). For example, in previous research examining predictors of mathematics achievement using a predecessor version of the CLASS, children exposed to more positive emotional interactions in fifth grade classrooms showed higher mathematics achievement by the end of the fifth grade (Pianta, Belsky et al., 2008). When focusing specifically on teacher-student interaction quality during mathematics instruction, however, no relationship between first grade teacher-student interaction quality and student mathematics achievement was found (Downer & Pianta, 2006).

The contemporary version of the CLASS, more widely used and validated than its predecessor, has been linked to achievement scores in the first grade (Hamre, Pianta, Mashburn, & Downer, 2011), but has not been studied in later grades or specifically in the context of mathematics instruction. There is reason to believe that there may be variation in teacher quality across content areas (Pianta, Belsky, Houts, & Morrison, 2007; Pianta, Belsky et al., 2008a), especially when implementing a new intervention (Peetsma, Hascher, van der Veen, & Roede, 2005; Stodolsky, Salk, & Glaessner, 1991). Measuring teacher-student interaction quality in the specific content area of interest, such as mathematics, may be useful for a precise empirical understanding of how an intervention changes that particular classroom setting.

Theory and research also support the notion that examining the processes that occur within schools and classrooms may uncover the mechanisms responsible for improved student mathematics achievement (Charles, Lester, & Frank, 1984; Dörnyei, 2000; Pianta & Hamre, 2009; Zamel, 1987) and may provide valuable information about points of leverage to improve student achievement. Thus, this chapter focuses on what occurs *inside* the classroom. Other factors outside of the classroom, such as principal leadership, however, may also play important roles in predicting student mathematics achievement, and thus are included in the present study.

Principal Leadership and Teacher-Student Interaction

There has been some work on unpacking the "black box" of how improving principal leadership translates into differences in teacher-student interaction quality and ultimately increases student achievement. Teachers with higher quality principal leadership had classrooms with higher teacher-student interaction quality than their counterparts with lesser quality principal leadership (Beteille, Kalogrides, & Loeb, 2009), suggesting the importance of principal leadership for predicting the quality of teaching day-to-day. Robinson, Lloyd, and Rowe (2008) measured the impact of principals on teacher-student interaction quality in a meta-analysis of 12 studies and showed that principal leadership had moderate effects on various aspects of teacher-student interaction quality, such as goal setting, planning, coordinating, teacher learning and development, classroom organization, instructional support, and emotional support. Specifically, the authors concluded that one of the core aspects of effective principal leadership in improving teacher-student interaction quality was the focus of the principal on his or her relationships with their teachers. Additionally, teachers with higher quality principal leadership reported higher teacher satisfaction (Grissom & Loeb, 2011). These studies extend Waters et al.'s (2003) work by describing how teacher-student interaction quality may mediate leadership effects on students.

The *Responsive Classroom* Approach

The *RC* approach, developed by the Northeast Foundation for Children, is an intervention, based on theoretical principles, that may create a positive learning environment, foster high academic achievement, and promote positive behavior. Principals and teachers are trained in the *RC* approach based on articulated principles and beliefs that: (a) social and academic

learning go hand-in-hand; (b) best practices for teaching are grounded in knowledge of how children learn; (c) knowing students developmentally, individually, and culturally informs all parts of classroom practice; and (d) all children want to learn and can learn. The *RC* approach teaches specific practices that translate these principles into behaviors and practices in the classroom. The *RC* approach could be seen as the opposite of approaches that attempt to "teacher-proof" curriculum, as teachers are the implementers and the change agents in their classrooms. *RC* is an unscripted SEL program that helps teachers learn to observe children and perceive their cues in a way that informs a child-specific teacher response. For example, the *RC* approach encourages sharing in "Morning Meeting" from teachers and students. A teacher could use this time to learn about children's interests and perspectives and use this information to inform his or her classroom practices.

The *RC* approach has seven essential principles to guide teachers' thinking and actions. These principles are: (a) equal emphasis on the social and academic curriculum; (b) focus on how children learn as much as what they learn; (c) the view that social interaction facilitates cognitive growth; (d) emphasis on cooperation, assertion, responsibility, empathy, and self-control as critical social skills for children to learn; (e) focus on knowing the children individually, culturally, and developmentally; (f) emphasis on knowing the families of the children; and (g) viewing the working relationships among adults at the schools as critically important (Northeast Foundation for Children, 2007).

Specific *RC* practices emerge from these principles. Practices include: (a) *morning meeting*, a daily meeting designed to create a sense of classroom community with time for sharing, games, and playful intellectual activity; (b) *rules and logical consequences*, where rules are established to prevent problems and consequences for problem behaviors follow logically from misdeeds, are developmentally and individually relevant to the child and rely on a trusting and positive relationship between the teacher and the child for their effectiveness; and (c) a shift in *teacher language*, where teachers learn to comment descriptively on children's effort and learning processes, not only products, as well as the use of encouragement rather than praise (Northeast Foundation for Children, 2007).

The training for *RC* typically consists of two week-long sessions during consecutive summers for both teachers and principals, plus coaching to teachers and principals during the year. Training is comprised of instruction in how to improve interactions between teachers and children and among peers (Northeast Foundation for Children, 1997, 2007). Coaching during the year creates opportunities for coaches to observe teachers, give feedback, demonstrate lessons with debriefing sessions, lead grade-level teacher meetings, meet with principals, and provide miniworkshops.

Support is also provided for principals through half-day meetings with a principal coach and other *RC* principals in the district and on-site follow-up consultations.

Influential Teacher and Student Characteristics

Some work suggests that teachers with fewer years of experience show higher teacher-student interaction quality (Pianta et al., 2007). Other work shows that years of experience may have diminishing returns on teacher-student interaction quality (Rosenholtz, 1986). These findings suggests the importance of including years of experience as a covariate. Further, student characteristics such as student eligibility for free/reduced-price lunch (FRPL), and English Language Learner (ELL) status, have been found to predict lower student mathematics achievement. Specifically, children eligible for FRPL are more likely to live in less cognitively-stimulating conditions, which relates to lower achievement (Collier, 1992; Sirin, 2005). Children with ELL status, on average, show lower achievement levels than those who speak English as a first language (Abedi, 2004; Collier, 1992; Hemphill & Vanneman, 2010). Therefore, an analysis examining predictors of mathematics achievement needs to include these covariates.

Model Equivalence and Measurement Equivalence Across Treatment and Control Groups

The aim of the *RC* approach is to create school-wide change; principals, teachers, and other professional staff implement *RC* practices with the goal of enhancing the socioemotional climate of the entire school. The fact that school-wide change is the target of implementation means that social processes within classrooms, among classrooms, and among all professional staff are all likely to be influenced by implementation of the *RC* approach. Given this presumption, the statistical assumption of model equivalence comes into question. That is, relations between the variables of interest and measurement equivalence cannot be assumed to be the same in the treatment and control groups (Raver, 2004). In fact, the specific aim of the intervention is to create change in the social system within a school, which, quite possibly, could be reflected in statistical analyses as model nonequivalence. Because the *RC* approach targets the social interactions among principals, teachers, and students, we expected the relations between variables in treatment schools to differ from those in schools using "business as usual" approaches, a question in need of empirical testing. In

the present study, multigroup models are used to allow different relations between variables to surface for each of the two groups of schools.

In addition to differences in relations between variables in our model, there may also be differences between treatment and control groups in the way that measures tap constructs in each group. Specifically, previous research suggests that measures may not always assess constructs in similar ways when there are substantive differences in populations of participants, such as being in a treatment or control group. For example, in filling out surveys participants compare themselves with different others and standards across cultures, which confounds any cross-cultural comparisons, as the reference groups are different (Heine, Lehman, Peng, & Greenholtz, 2002). This intervention does potentially change the reference group, and thus makes model equivalence questionable, as teachers in the intervention group will compare themselves with others in the same school who are also exposed to the intervention.

In the present study, differences between treatment and control groups are modeled by allowing both (a) measurement nonequivalence, that is the constructs of teachers' perceptions of principal leadership (as teachers' perceptions of principals may be altered by participating in an intervention) and teacher-student interaction quality (the teachers interact with students in a different way in the presence of the *RC* intervention), and (b) the relations between teacher perception of principal leadership, teacher-student interaction quality, and student achievement (as a systematic change is predicted to occur in the presence of the *RC* intervention) to vary across treatment and control groups.

The multigroup modeling approach is uniquely designed to specifically examine not only mean differences between groups, but also the similarities and differences in relations across two groups (model equivalence), such as the treatment and control groups in the present study. In the present study, multigroup analysis is used to compare the direct and indirect influences of principal leadership on student mathematics achievement, across schools, in the *RC* treatment group and in the control group, simultaneously allowing for measurement nonequivalence across the groups.

HYPOTHESES

Using a multigroup, multilevel structural equation model, we tested the following hypotheses separately in the treatment and control groups (see Figure 4.1). The groups were tested separately because there is reason to believe that the assumptions of model equivalence and measurement equivalence may not be appropriate in intervention studies. The hypotheses tested separately in both groups are: (a) teachers who perceived

that their principals had stronger leadership skills would show higher teacher-student interaction quality, after controlling for years of teaching experience; (b) students whose teachers have higher observed teacher-student interaction quality would have higher mathematics achievement, controlling for previous mathematics achievement and student demographic characteristics (FRPL and ELL); and (c) the indirect relationship between teachers' perceptions of their principal's leadership and student mathematics achievement would be fully mediated by teacher-student interaction quality.

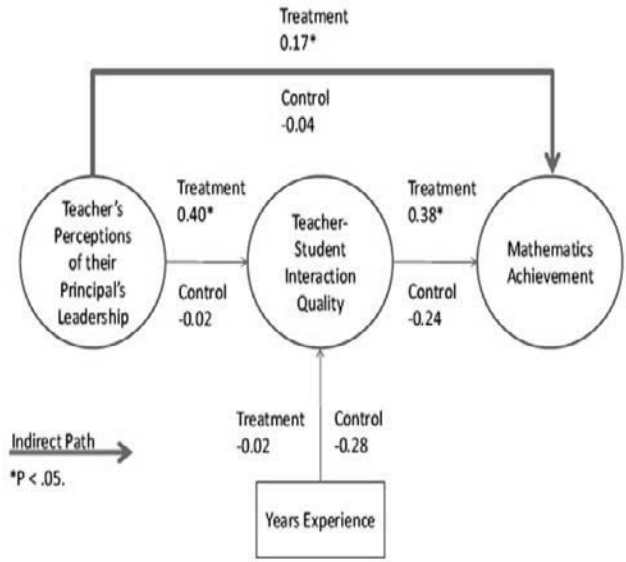


Figure 4.1. Level 2 model standardized betas for the relations between teacher perceptions of their principal's leadership, teacher-student interaction quality, and mathematics achievement in the treatment and control groups. Level 1 regressed student mathematics scores on pretest mathematics scores, free or reduced lunch status, and English language learner status.

METHOD

The study included third-grade teachers and their students in the first year of a 3-year longitudinal cluster randomized controlled trial, the Responsive Classroom Efficacy Study (RCES). RCES was designed to examine the impact of the *RC* approach on teacher-student interaction quality and student mathematics achievement in a cohort of students as they progressed from third through fifth grades.

Participants

RCES participants came from 24 elementary schools in a mid-Atlantic district. Schools were randomized using student ethnic composition and FRPL as stratification variables. There were 13 schools in the treatment group and 11 schools in the control group. Participating schools represented diverse sociodemographic characteristics, with the proportion of student eligibility for FRPL ranging from 2% to 72% (M = 26.21%) and minority composition ranging from 17% to 86% (M = 54.73%). Independent t-tests at baseline revealed no statistically significant differences between treatment and control schools on FRPL, minority status, and ELL status, thus approximate equivalence was established at the beginning of the study.

The demographic characteristics for the students involved in the study at the school level (the level of randomization) can be found in Table 4.1. Student participants were in third grade and included 707 students (from 41 classrooms) from the treatment group and 791 students (from 44 classrooms) from the control group.

The teacher sample included 85 third grade teachers (41 treatment, 44 control), representing a 95% response rate of the classrooms. Teachers were predominately female (94.6%) and White (84.3%) with 7.0% African American, 3.5% Asian, and 5.2% of other ethnicities. Sixty percent of the teachers had earned a master's degree at the beginning of the study. On average, teachers had 7.8 years of teaching experience, with a range from 2.5 to 16.5 years of experience. There were no significant differences between the two groups on these demographic variables.

Procedures

RC training. Third-grade teachers assigned to the intervention group received one week of training in the *RC* approach prior to classroom data collection. The *RC* 1 training emphasized five of the 10 *RC* practices including *morning meeting, rule creation, interactive modeling, positive teacher language, and logical consequences.* Teachers assigned to the intervention group received three in-person consultations with *RC* coaches throughout the intervention school year, in addition to e-mail and phone communication at the teachers' discretion. Teachers in the intervention group also received books and resources pertinent to the intervention. Third-grade teachers assigned to the control group received no exposure to *RC* training or coaching support and continued "business as usual" classroom instruction, with the promise of receiving *RC* training at the end of the study.

Table 4.1. Descriptive Statistics for: Covariates at School Level, Indicators for Teachers' Perception of Their Principal's Leadership, and Indicators for CLASS (Teacher-Student Interaction Quality)

	Treatment Group		*Control Group*	
Variable	$\bar{x}$ *(SD)*	*Range*	$\bar{x}$ *(SD)*	*Range*
Covariates of School Level[a]				
% Minority	64.2% (18.8%)	39–98%	53.8% (24.4%)	14–93%
% Free or reduced lunch	37.9% (27.0%)	6–90%	27.2% (24.4%)	4–79%
% English Language Learner	37.5% (19.3%)	16–78%	30.1% (17.3%)	7–69%
Teacher's years of experience	7.75 (3.4)	2.5–16.5	11.0 (5.0)	3.8–19.6
Teachers' Perception of Their Principal's Development				
Clear expectations	2.9 (.7)	1–4	3.4 (.5)	3–4
Clear vision	2.9 (.8)	1–4	3.4 (.5)	3–4
High standards	3.0 (.6)	1–4	3.4 (.5)	3–4
Pressed for use of professional development	2.9 (.6)	1–4	3.3 (.6)	2–4
CLASS indicators (Teachers-Student Interaction Quality)[a]				
Emotional support	5.2 (.5)	4.2–6.1	5.1 (.4)	4.3–6.1
Classroom organization	5.1 (.4)	4.7–5.9	5.1 (.3)	5.2–5.9
Instructional support	3.1 (.6)	2.0–4.6	3.1 (.5)	2.2–4.6

[a] *t*-tests found no difference between groups for covariates or CLASS indicators.

Intervention year. Beginning in the fall of the intervention year, all participating third-grade teachers were observed for three, 1-hour mathematics lessons, each conducted during a "typical" school day. These observations were distributed over the year corresponding to fall, winter, and spring. At each time point, research assistants videotaped the teachers for 60 minutes of mathematics instruction. In the spring of the intervention year, all teachers completed a questionnaire, administered via the web, that included teacher demographic questions and questions about teachers' perception of their principal's leadership quality. At the same time of year, all third-grade students enrolled in these teachers' classrooms

were given the state achievement test. Student demographic (FRPL, ELL) and test score data were transferred from the district to the research team. Teachers were paid incentives for participation in observational data collection and survey collection.

Measures

Teachers' perceptions of principal leadership quality. Teachers rated their principal on the School Leadership and Change scale garnered from publicly available measures (Consortium on Chicago School Research, 2005). The scale was comprised of 10 items on a 1 to 4 scale (from strongly disagree to strongly agree) to measure teachers' perception of their principal's leadership. After administration, the measure was trimmed to four items using an iterative process involving factor analysis and judgments of theoretical fit. The resulting measure was based on four items: (a) "The principal at my school makes clear to the staff his or her expectations for meeting instructional goals," (b) "The principal at my school communicates a clear vision for our school," (c) "The principal at my school sets high standards for teaching," and (d) "The principal presses teachers to implement what they have learned in professional development." The reliability for the scale comprised of these four items was .85 and .87 for the treatment and control schools, respectively.

Teacher quality. The CLASS measure (Pianta et al., 2008) describes 10 dimensions, each of which is rated on a scale from 1 (low) to 7 (high). Composites for the 10 dimensions reduce to three well-validated domains of emotional support, classroom organization, and instructional support (Pianta Belsky et al., 2008).

Emotional support contains the dimensions of *positive climate*, *negative climate* (reverse coded), *teacher sensitivity*, *and regard for students' perspective*. Positive climate is measured by: (a) supportive relationship, (b) positive affect, (c) positive communication, and (d) respect. Negative climate is rated by: (a) negative affect, (b) punitive control, (c) sarcasm/disrespect directed at students, and (d) shared negativity. Teacher sensitivity is measured by: (a) awareness of student needs, (b) responsiveness, (c) addressing students' problems and concerns, and (d) evidence of student comfort. Regard for students' perspective is measured by (a) flexibility and student focus, (b) support for autonomy and leadership, (c) student expression, and (d) restriction of movement.

Classroom organization contains the dimensions of *behavior management*, *productivity*, and *instructional learning formats*. *Behavior management* is measured by: (a) having clear expectations for behavior, (b) taking a proactive approach to problem behaviors, (c) redirecting misbehavior, and (d)

observing a low frequency of student misbehavior. *Productivity* is measured by: (a) maximizing learning time, (b) having clear routines, (c) having efficient transitions, and (d) being prepared. *Instructional learning formats* are measured by: (a) effective facilitation, (b) use of a variety of modalities and materials, (c) consistent student interest, and (d) clarity of learning objectives.

Instructional support contains the dimensions of *concept development*, *quality of feedback*, and *language modeling*. *Concept development* is measured by: (a) use of analysis and reasoning activities (*why* and/or *how* questions), (b) providing opportunities for students to create ideas (brainstorming and planning), (c) integration of concepts and activities, and (d) connecting content to the real world. *Quality of feedback* is measured by: (a) scaffolding, (b) frequent feedback loops between teachers and students, (c) prompting thought processes, (d) providing information, and (e) encouragement and affirmation. *Language modeling* is measured by: (a) frequent conversations, (b) use of open-ended questions, (c) frequent repetition and extension, (d) use of self and parallel talk, and (e) using advanced language (a variety of words).

Within each of the 60-minute observations, two consecutive 15-minute segments were scored individually. To minimize rater bias, each 15-minute segment was randomly assigned to an independent rater, blind to treatment condition. Additionally, raters were assigned no more than 30% of a given teacher's segments. Domain scores for each 15-minute segment were calculated by averaging across dimension scores. Segment-level domain scores were then averaged across all four observed segments to create domain-level mean scores. Aggregated emotional support, classroom organization, and instructional support domain scores served as indicators of teacher-student interaction quality.

Initial coder reliability was established on a minimum of ten 15–20 minute master-coded classroom observations, using percent agreement consistent with guidelines described by Pianta et al. (2008). Agreement was considered to be any score within one point of the master code. Percent agreement within one point exceeded 80% for all coders. Interrater reliability was assessed on an ongoing basis via semimonthly calibration meetings in which all coders watched and scored a 15-minute observation segment selected at random. Coders' scores were recorded and used to calculate ICCs at three time points during the coding period, ranging from 0.83 to 0.85. These ICCs reflect the absolute agreement among raters, accounting for the systematic variability in scores due to raters. At the conclusion of the coding period, a random audit was conducted in which four segments were selected at random from each coder. These segments were recoded by a CLASS master coder. Percent agreement within one point between the original coder and the master coder exceeded 80%.

Mathematics achievement, sociodemographic data, and teachers' years of experience. Student achievement in mathematics was measured during the spring of the baseline year using the Stanford 10 abbreviated (Harcourt Educational Measurement, 2002) as a pretest. The posttest was the state assessment of mathematics (Standards of Learning) as administered by the state of Virginia (Virginia Department of Education, 2010). Control variables included: FRPL (1 = student received free or reduced lunch, 0 = student did not receive free or reduced lunch) and ELL status (1 = student is classified as ELL, 0 = Student is not classified as ELL). These were measured by the school district. The teachers' years of experience was assessed in a teacher demographic survey.

ANALYTIC STRATEGY

The present study differs from other work on the *RC* approach (Ottmar, Rimm-Kaufman, & Berry, 2012; Rimm-Kaufman, Fan, Chiu, & You, 2007). Instead of examining differences in classroom or child outcomes between intervention and control groups, we use multigroup modeling to focus on the differences in the relations in the variables of interest between the groups (i.e., the relation between teachers' perceptions of their principal's leadership and teacher-student interaction quality; the relation between teacher-student interaction quality and student mathematics achievement). The multi-group analysis allows the entire model to be estimated once for the treatment group and once for the control group. This approach allows all relations within the model to differ between the two groups and is the only way to examine our main research focus, the effect of the intervention on the overall system (Wanless, Larsen, & Son, 2011).

Within this multigroup approach, we ran multilevel SEMs for both the treatment and control groups to test the hypothesized relationships between teachers' perceptions of their principal's leadership, teacher-student interaction quality, and student mathematics achievement. These multilevel models had two levels,with students (level 1) nested in teachers (level 2). Teacher experience was treated as a control variable at the teacher level and previous mathematics achievement, FRPL status, and ELL status were treated as control variables at the student level. Specifically, we tested the extent to which teachers' perceptions of their principal's leadership related to teacher-student interaction quality and the extent to which teacher-student interaction quality related to student mathematics achievement. Thus, we tested direct effects, as well as an indirect effect examining the extent to which teacher-student interaction quality mediated the relation between teachers' perceptions of their principal's leadership and student mathematics achievement.

Multilevel SEM provides descriptive and diagnostic information about the model and combines aspects of confirmatory factor analysis and hierarchical linear modeling (Bollen, 1989; Goldstein, 2010; Kline, 2011). SEM assumes normality of the endogenous variables, linear relationships between variables, no outliers, independence of observations, and limited missing data, or an appropriate method for handling missing data (Kline, 2011). Data were examined through histograms, bivariate correlations, QQ-plots, and other diagnostic methods. The assumptions of normality, linearity, and no outliers were met. Rather than having independent observations at the levels where the variables of interest are, the students were nested within teachers. The lack of independence was high at the teacher level (ICCs = .244 for control and .303 for treatment). Therefore, we ran a two-level model (students nested within teachers) in Mplus Version 6.11 (Muthén & Muthén, 1998–2010) to account for the teacher level dependencies (Muthén & Satorra, 1995).

A Bayesian estimator was used in the model estimation to handle the relatively small sample size at the teacher level and because the Bayesian estimator was robust to distributional assumptions of the estimated parameters of interest. The Bayesian estimator, thus, produces more trustworthy results than a maximum likelihood estimator (Lee & Song, 2004; Muthén, 2010). Missing data were minimal (<5% across all variables, both groups) and weredetermined to be missing at random (MAR), through bivariate correlations on missingness. Missing data were handled using the Bayesian estimator as well. Similar to FIML, the Bayesian estimator uses all available data to estimate parameters (Asparouhov & Muthén, 2010; Little & Rubin, 1987). As we did not have a clear picture of how the intervention would affect the groups, we did not specify priors, and thus, non-informative priors were used. Two chains were used in the Markov chain Monte Carlo estimation method to judge convergence appropriately. The model converged within 50,000 iterations. All trace plots showed appropriate mixing and the autocorrelations were low.

RESULTS

Descriptive Statistics and Correlation Coefficients

Tables 4.1 and 4.2 have descriptive statistics and correlations. Means, standard deviations, and ranges were similar across the treatment and control groups for all variables except for the indicators of the teachers' perceptions of their principal's leadership. Specifically, teachers in the treatment group used the whole range of responses for teachers' perceptions of principal leadership (range 1–4) and teachers in the control group

Table 4.2. Correlations of Variables in the Treatement and Control Groups

Variable	*Treatment of Control*	*Mathematics Store*	*Principal Expectations*	*Principal Vision*	*Principal Standards*	*Principal Presses PD*	*Emotional Support*	*Classroom Org.*	*Instructional Support*
Principal Expectations	Trt	.090*							
	Cnt	*-.024*							
Principal Visions	Trt	.089*	.890**						
	Cnt	*-.140***	*.646***						
Principal Standards	Trt	.132**	.811**	,702**					
	Cnt	*-.121***	*.799***	*,782*					
Principal Presses PD	Trt	.015	.353**	.233**	.527**				
	Cnt	*-217***	*.410***	*.655***	*.685***				
Emotional Support	Trt	.102**	.325**	.262**	.429**	.206**			
	Cnt	*-.048**	*.179***	*.015**	*.276***	*.235***			
Classroom Org.	Trt	.010	.223**	.123**	.137**	.169**	.664**		
	Cnt	*-.089**	*-.115***	*-.017*	*.097***	*.195***	*.656***		

(Table continues on next page)

Table 4.2. (Continued)

Variable	*Treatment of Control*	*Mathematics Store*	*Principal Expectations*	*Principal Vision*	*Principal Standards*	*Principal Presses PD*	*Emotional Support*	*Classroom Org.*	*Instructional Support*
Instructional Support	Trt	.038	.368**	.380**	.467**	.164**	.719**	.577**	
	Cnt	*-.001*	*-.033**	*-.087**	*.003*	*.101***	*.720***	*.558***	
Years Teaching	Trt	.069	.324**	.350**	.096*	.065	.042	.163**	-.001
	Cnt	*.109***	*.010**	*-.105***	*-.194***	*-.253***	*-.397***	*-.083**	*-.040*

*$p < .05$. **$p < .01$

PD = Professional Development. *Note.* Control group correlations are presented in italics.

used (3–4) for most items; this indicates that all the teachers at the control schools rated their principals highly while all teachers in the treatment schools did not. This difference in range has substantive implications for our analysis which are addressed in the discussion section.

Factor Loadings

Table 4.3 presents factor loadings for the two constructs in our models: (a) teacher-student interaction quality and (b) teachers' perceptions of their principal's leadership for both the treatment and control groups. In both groups all teachers' perceptions of their principal's leadership items had strong and significant loadings except for the "Pressed for use of professional development strategies" indicator, which had a relatively low loading in the treatment group. For the teacher-student interaction quality construct, loadings were consistently strong across both groups.

Table 4.2. Standardized Parameter Estimates for Factor Loadings of Teachers' Perceptions of Their Principal's Leadership and Teacher-Student Interaction Quality

	Standardized β	
Variable	*Treatment*	*Control*
Teacher Perception of Their Principal's Leadership		
Personal expectations	0.98**	0.71**
Principal vision	0.90**	0.85**
Principal standards	0.83**	0.97**
Pressed for use of professional Development	0.36**	0.67**
CLASS Indicators (Teacher-Student Interaction Quality)		
Emotional support	0.91**	0.95**
Classroom organization	0.76**	0.71**
Instructional support	0.81**	0.76**

*$p < .05$. **$p < .01$

Structural Model

Direct effects. Both the main direct effects tested at the teacher level (teachers' perceptions of their principal's leadership to teacher-student interaction quality and teacher-student interaction quality to student

mathematics achievement) showed a significant positive relation in the treatment group, but no significant relationship in the control group (see Figure 4.1). Specifically, teachers in the treatment group (but not in the control group) who perceived their principal as being one point higher on leadership skills (on a scale of 1–4, 4 being high), had a classroom where teacher-student interaction quality was .30 points higher (on a scale of 1-7; $\beta = .4$, two-sided $p < .05$). Likewise, for every 1 point positive difference in teacher-student interaction quality (on a scale of 1–7) teachers in the treatment group (but not in the control group) had students with an average of 17.67 points higher on mathematics achievement (on a scale of 0-600; $\beta = .38$, two-sided $p<.05$). The models accounted for 16% (treatment group) and 5% (control group) of the variance of student mathematics achievement at the teacher level. A path between teachers' years of teaching experience was also included in these models, but was not found to be statistically significant in either the treatment or control groups. Additionally, a direct path between teacher perception of their principal's leadership and student outcomes was included but was not significant in the treatment or control groups. Thus, in the final model for both groups, that path was dropped, leaving an indirect effect between teachers' perceptions of their principal's leadership and student mathematics achievement through teacher-student interaction quality. The covariates at the student level behaved as would be expected in both groups, with FRPL and ELL being significantly negatively related to student mathematics achievement, and previous mathematics achievement being positively related to current mathematics achievement. These variables were included in the model as controls only and there are no substantive questions regarding them;they are not shown in Figure 4.1.

Indirect effect. An indirect effect at the teacher level was tested between teachers' perceptions of their principal's leadership and student mathematics achievement, via teacher-student interaction quality. Teachers' perceptions of their principal's leadership had a significant and positive indirect relation to student mathematics achievement in the treatment group (indirect effect $\beta = 3.38$, two-sided $p<.05$), but not in the control group. This indicates that in the treatment group, teachers with perceptions of their principal's leadership that were one point higher than average (on a scale of 1–4), had students with an average mathematics achievement score that was 3.38 points higher (on a scale 0–600).

DISCUSSION

The present study addressed three main research questions regarding: (a) the direct effect of principal leadership on teacher-student interaction

quality, (b) the direct effect of teacher-student interaction quality on student mathematics achievement, and (c) the indirect effect of principal leadership on student mathematics achievement via teacher-student interaction quality. These questions were investigated separately in the *RC* and control schools to examine patterns of relations in schools using the *RC* approach compared to a control condition.

Direct Effect of Principal Leadership on Teacher-Student Interaction

Analyses indicated a positive direct effect of principal leadership on teacher-student interaction quality, which is consistent with existing literature showing the importance of principal effectiveness for predicting teacher-student interaction quality (Robinson et al., 2008). Specifically, in the treatment schools, third-grade teachers who perceived their principals as having higher leadership quality had significantly higher observed teaching quality. In other words, in the treatment group, teachers who perceived that their principal made his/her expectations for meeting instructional goals clear, communicated a clear vision for the school, had high standards for teaching, and pressed for use of professional development strategies had higher teacher-student interaction quality in the classroom. By contrast, in the control group, perceived principal leadership was not significantly related to teaching quality. One possible explanation for this relationship in the treatment but not the control schools is that the *RC* approach aims to influence key interactions within the entire school. Specifically, *RC* training targets interactions by encouraging principals and teachers to attend trainings together; by describing uses of *RC* practices in shared school spaces such as school hallways and cafeterias; by encouraging community-building activities in classrooms and school-wide, such as Morning Meetings; and by holding grade-level coaching meetings with the teachers as a team. These training structures and practices send a strong message that *RC* practices should extend beyond the classroom and occur across groups of key stakeholders in schools. This enhances the relationships between teachers and their principals, and in essence, amplifies the influence of those relationships in a school as it pertains to student mathematics achievement.

Direct Effect of Teacher-Student Interaction Quality on Student Mathematics Achievement

Findings from the present study indicate that higher teacher-student interaction quality related to higher student mathematics achievement in

the *RC* schools. This finding aligns with previous literature documenting the important role that teachers play in influencing children's mathematics achievement throughout elementary school (Nye et al., 2004). Further, this finding extends previous work by establishing a significant positive link between teaching quality and student mathematics achievement when using an observational measure of quality and observing in a content-specific context: mathematics instruction. This relationship was not present, however, in the control schools.

Indirect Effect of Principal Leadership on Mathematics Achievement

Although teachers' perceptions of their principal's leadership did not directly relate to student achievement, they were found to have a significant, positive, indirect relationship with student mathematics achievement via teacher-student interaction quality in the treatment schools only. In other words, in the treatment group, when teachers perceived that their principal made clear his or her expectations for meeting instructional goals, communicated a clear vision for the school, had high standards for teaching, and pressed for use of professional development strategies,student mathematics achievement was higher via higher teaching quality. Current findings fit with previous work showing that principal leadership is related to student achievement indirectly through its influences on teachers (Hallinger & Heck, 1998) and that effective principal leadership catalyzes other positive effects within schools. For instance, Bryk and Schneider (2010) describe "five essential supports for school improvement" (p. 197), including ties to parents and the broader community, professional capacity of the teachers and other staff, presence of a student-centered learning environment, and the presence of an instructional guidance system. School leadership stands at the forefront among those supports and drives the coherence among the various elements that often leads to school improvement. Noteworthy from their findings from several hundred schools in Chicago, not a single school that showed strong signs of improvement had weak leadership.

RC Approach

Taken together, findings in the *RC* schools show direct effects between teachers' perceptions of their principal and teacher-student interaction quality; direct effects between teacher-student interaction quality and student mathematics achievement; and indirect effects between teachers' perceptions of their principal's leadership and student mathematics

achievement. These significant associations, however, were not present in the control schools, indicating that there was a relationship between *RC* and treatment schools having tighter associations among key principal, teacher, and student variables. The schools in the present study were randomized into treatment and control groups and did not show significant differences in initial socioeconomic, ethnic, and ELL student composition. Therefore, the contrast in the associations between principal, teacher, and student constructs in the treatment and control groups suggest that the *RC* approach was related to greater associations among principals, teachers, and students.

There are a few possible explanations for the higher associations in the intervention group than control group. To start, consider that the teacher-student interaction quality to achievement association was only present in *RC* schools because of the focus of the *RC* approach (Northeast Foundation for Children, 2007). Specifically, the *RC* approach is designed to build stronger relationships between teachers and students—a finding that has been validated in earlier work (Rimm-Kaufman, Fan, Chiu & You, 2007). For instance, teachers are trained in *RC* practices including *teacher language and academic choice*, in ways to observe children more closely and tailor their teaching approach to respond to the needs of the individual students, and to use specific language to encourage student progress and work. Teachers engage in daily activities, such as the *morning meeting*, designed to enhance their social connection to one another and among peers. Although more research needs to be conducted to examine the exact mechanisms underlying this finding, the present work suggests that the *RC* training supports a stronger relation between teachers and students so that the teacher-student interactions are more influential on student mathematics achievement.

Another explanation is that the *RC* approach strengthened interconnectedness or trust between stakeholders. Although speculative, the strength of the associations among the principal, teachers, and students may indicate the presence of interconnectedness among stakeholders. Interconnectedness has been found in previous research to support school success (Bryk & Schneider 2003).The associations among principal leadership, teaching quality, and mathematics achievement were not present in the control schools. This is a surprising finding given previous literature linking these constructs (Hallinger & Heck, 1998; Robinson et al., 2008). Schools have been noted, however, for their lack of coherence or interconnectedness between stakeholders within the school (Rosenholtz, 1986). We offer two possible explanations for the lack of relation among principals, teachers, and students in control schools. With respect to principals and teachers, specifically, one possible explanation is limited communication and lack of connection. The limited range in the control school teachers' perception of principal leadership compared to the intervention schools suggests

a possible disconnection between teachers and principals at the control schools. *RC* training may enhance teachers' ability to observe and notice what constitutes excellence in leadership. A second plausible explanation is that the design did not provide sufficient statistical power to detect relations in the control schools. The relations in the *RC* schools may have been enhanced (increased relations between teacher mathematics knowledge, teacher mathematics teaching quality, and student achievement) as has been noted elsewhere, and thus been more easily detectable (Ottmar et al., 2012). If there was a larger sample size it is possible that the control schools would have exhibited the same pattern as treatment schools, albeit weaker.

Future Directions and Limitations

Several limitations were found in this study. First, only 24 schools were enrolled which may have resulted in an underpowered study. Second, the observational measure of teacher-student interaction quality was a general measure and not specific to mathematics. With a more refined measure, stronger connections between interaction quality and outcomes may be detected. The presence of findings regarding teacher-student interaction quality with this general measure, however, suggests that the measure was sensitive to some differences in context-specific teaching quality. Future research may consider using a mathematics-specific measure to detect nuances in teacher-student interactions that are unique to the mathematics instructional context.

Findings from the present study suggested that *RC* was related to schools having stronger associations among principal leadership, teacher quality, and student mathematics achievement. These relations were represented by the significant coefficients in the structural equation model, and those coefficients serve as a preliminary indication that an intervention may directly influence principal, teacher, and student behaviors, as well as the relations among them. One limitation of the present study, however, was the lack of a direct measure of the relationships among key players. Specifically, principals, teachers, and students were not asked directly about how they perceived the interconnectedness or coherence in their schools. Perhaps further study into the coherence or interconnectedness of the stakeholders, with direct measures of interconnectedness, may be appropriate.

Practical Implications

Results from the present study suggest that principals have both direct and indirect influence on student mathematics achievement, via teacher-

student interaction quality. These findings suggest that although principals are generally not working directly with students, they play an important role in improving mathematics skills. Specifically, the findings raise the possibility that efforts to support the quality of principal leadership may ultimately strengthen students' mathematics success.

These direct and indirect relations, however, were only present in schools being trained in an SEL intervention, the *RC* approach. In order to take advantage of the maximum positive impact that principals may have on student mathematics achievement, schools should consider pairing efforts to bolster principals' professional development with school-wide SEL programs such as the *RC* approach.

Finally, previous research suggests that tightening relations among key players in schools may have a positive effect on student outcomes (Bryk & Schneider, 2003; Goddard, 2003; Louis & Wahlstrom, 2011). The present study is the first study (to our knowledge) to identify an intervention that indicates stronger relations among principals, teachers, and students. Thus, we raise questions about the mechanism for future inquiry. For example, do interventions such as the *RC* approach amplify the effects of principals on teachers and teachers on students? Future research on the effects of SEL interventions may consider comparable relations in those studies as well as shed light on the mechanism explaining those associations.

REFERENCES

Abedi, J. (2004). The No Child Left Behind Act and English language learners: Assessment and accountability issues. *Educational Researcher*, *33*(1), 4–14. doi:10.3102/0013189X033001004

Asparouhov, T., & Muthén, B. (2010). Bayesian analysis using Mplus: Technical implementation. Mplus Technical Report. Retrieved from http://www.statmodel.com

Beteille, T., Kalogrides, D., & Loeb, S. (2009). *Effective schools: Managing the recruitment, development, and retention of high-quality teachers*. CALDER Working paper 37. The Urban Institute. Washington, DC. Retrieved from http://www.urban.org/url.cfm?ID=1001428

Bollen, K. (1989). *Structural equations with latent variables*. New York, NY: John Wiley & Sons.

Borman, G., & Overman, L. (2004). Academic resilience in mathematics among poor and minority students. *The Elementary School Journal*, *104*, 177–195. doi:10.1086/499748

Bryk, A. S., & Schneider, B. L. (2003). Trust in schools: A core resource for school reform. *Educational Leadership*, *60*(6), 40–45.

Charles, R. I., & Lester, J., Frank K. (1984). An evaluation of a process-oriented instructional program in mathematical problem solving in grades 5 and 7. *Journal for Research in Mathematics Education*, *15*, 15–34. doi:10.2307/748985

Collaborative for Academic, Social, and Emotional Learning. (n.d.) "*What is SEL?*" Retrieved fromhttp://casel.org/why-it-matters/what-is-sel/

Collier, V. (1992). A synthesis of studies examining long-term language minority student data on academic achievement. *Bilingual Research Journal*, *16*(1), 187–212. doi:10.1080/15235882.1992.10162633

Consortium on Chicago School Research. (2005). *Survey of Chicago public schools: Elementary school teacher edition*. Retrieved from http://tinyurl.com/3cywwsj

Cotton, K. (1995). *Effective schooling practices: A research synthesis. 1995 update*. (School Improvement Research Series). Portland, OR: Northwest Regional Educational Laboratory. Retrieved from http://tinyurl.com/6fjeudu

Dörnyei, Z. (2000). Motivation in action: Towards a process-oriented conceptualization of student motivation. *British Journal of Educational Psychology*, *70*(4), 519–538. doi:10.1348/000709900158281

Downer, J. T., &Pianta, R. C. (2006). Academic and cognitive functioning in first grade: Associations with earlier home and child care predictors and with concurrent home and classroom experiences. *School Psychology Review*, *35*(1), 11–30.

Durlak J. A., Weissberg R. P., Dymnicki A. B., Taylor R. D., & Schellinger K. B. (2011). The impact of enhancing students' social and emotional learning: a meta-analysis of school-based universal interventions. *Child Development*, *82*(1), 405–432. doi:10.1111/j.1467-8624.2010.01564.x

Goddard, R. D. (2003). Relational networks, social trust, and norms: A social capital perspective on students chances of academic success. *Educational Evaluation and Policy Analysis*, *25*(1), 59–74. doi:10.3102/01623737025001059

Goldstein, H. (2010). Multilevel factor analysis, structural equation and mixture models. In W. A. Shewhart & S. S. Wilks (Eds.), *Multilevel statistical models* (pp. 189–200). Wiley Online Library. doi:10.1002/9780470973394.ch8

Gonzales, P., Williams, T., Jocelyn, L., Roey, S., Kastberg, D., &Brenwald, S. (2008). *Highlights From TIMSS 2007: Mathematics and Science Achievement of U.S. Fourth- and Eighth-Grade Students in an International Context* (NCES 2009–001 Revised). National Center for Education Statistics, Institute of Education Sciences, U.S. Department of Education. Washington, DC. Retrieved from http://tinyurl.com/6nlpdn

Greenberg, M. A. (2010): School-based prevention: current status and future challenges, *Effective Education*, *2*(1), 27–52. doi:10.1080/19415531003616862

Grissom, J., & Loeb, S. (2011) Triangulating principal effectiveness: How perspectives of parents, teachers, and assistant principals identify the central importance of managerial skills. *American Education Journal, 48,* 1091–1121. doi:10.3102/0002831211402663

Hackenberg, A. (2010). Mathematical caring relations in action. *Journal for Research in Mathematics Education*, *41*(3), 236–273.

Hallinger, P., & Heck, R. (1998). Exploring the principal's contribution to school effectiveness: 1980-1995. *School Effectiveness and School Improvement: An International Journal of Research, Policy and Practice*, *9*(2), 157–191. doi:10.1080/0924345980090203

Hamre, B., Pianta, R., Mashburn, A., & Downer, J. (2011).*Building a science of classrooms: Application of the CLASS framework in over 4,000 US early childhood and*

elementary classrooms. Manuscript submitted for publication. Retrieved from http://tinyurl.com/3tfnj5y

Hamre, B. K., &Pianta, R. C. (2005). Can instructional and emotional support in the first-grade classroom make a difference for children at risk of school failure? *Child Development*, *76*(5), 949–967. doi:10.1111/j.1467-8624.2005.00889.x

Harcourt Educational Measurement. (2002). *Stanford Achievement Test Abbreviated* (10th ed.) San Antonio, TX: Harcourt Assessment.

Heck, R. H. (2007). Examining the relationship between teacher quality as an organizational property of schools and students' achievement and growth rates. *Educational Administration Quarterly*, *43*, 399–432. doi:10.1177/0013161X07306452

Heine, S. J., Lehman, D. R., Peng, K., & Greenholtz, J. (2002). What's wrong with cross-cultural comparisons of subjective Likert scales? The reference group problem. *Journal of Personality and Social Psychology*, *82*, 903–918. doi:10.1037/0022-3514.82.6.903

Hemphill, F. C., & Vanneman, A. (2010).*Achievement gaps: How Hispanic and White students in public schools perform in mathematics and reading on the National Assessment of Educational Progress* (NCES 2011-459). National Center for Education Statistics, Institute of Education Sciences, U.S. Department of Education. Washington, DC. Retrieved from http://tinyurl.com/3mrzcjs

Horng, E., Demetra Kalogrides, & Susanna Loeb. (2009). Principal preferences and the unequal distribution of principals across schools. CALDER Working Paper No. 36. Washington, DC:

Kline, R. B. (2011). *Principles and practice of structural equation modeling* (3rd ed.). New York, NY: The Guilford Press.

Lee, S., & Song, X. (2004). Evaluation of the Bayesian and maximum likelihood approaches in analyzing structural equation models with small sample sizes. *Multivariate Behavioral Research*, *39*(4), 653–686. doi:10.1207/s15327906mbr3904_4

Leithwood, K., & Jantzi, D. (2000). The effects of transformational leadership on organizational conditions and student engagement with school. *Journal of Educational Administration*, *38*, 112–129. doi:10.1108/09578230010320064

Leithwood, K., Louis, K. S., Anderson, S., & Wahlstrom, K. (2004). *How leadership influences student learning: A review of research for the Learning from Leadership Project*. New York, NY: The Wallace Foundation. Retrieved from http://tinyurl.com/3eu8ebf

Leithwood, K., Patten, S., & Jantzi, D. (2010). Testing a conception of how school leadership influences student learning. *Educational Administration Quarterly*, *46*, 671–706. doi:10.1177/0013161X10377347

Little, R., & Rubin, D. (1987). *Statistical analysis with missing data* (2nd ed.). New York, NY: John Wiley & Sons.

Louis, K. S., & Wahlstrom, K. (2011).Principals as cultural leaders. P*hi Delta Kappan*, *92*(5), 52–56. Retrieved from http://tinyurl.com/6e3hazr

Marzano, R., Waters, T., & McNulty, B. (2005). *School leadership that works: From research to results*. Aurora, CO: Association for Supervision and Curriculum Development and McREL.

Muthén, B. (2010). *Bayesian analysis in Mplus: A brief introduction*. Mplus Technical Report. Retrieved from http://tinyurl.com/429vz8n

Muthén, B., & Satorra, A. (1995).Complex sample data in structural equation modeling. *Sociological Methodology*, *25*, 267–316. doi:10.2307/271070

Muthén, L, & Muthén, B. (1998–2010). *Mplus user's guide* (6th ed.). Los Angeles, CA: Author. Retrieved from http://tinyurl.com/4ysesxk

Northeast Foundation for Children. (n.d.). The Responsive Classroom Approach. Retrieved from http://tinyurl.com/3wf3r9u

Northeast Foundation for Children. (2007). *The Responsive Classroom Level 1 Resource Book*. Greenfield, MA: Northeast Foundation for Children.

Nye, B., Konstantopoulos, S., & Hedges, L. V. (2004). How large are teacher effects? *Educational Evaluation and Policy Analysis*, *26*(3), 237–257. doi:10.3102/01623737026003237

Ottmar, E. R., Rimm-Kaufman, S., & Berry, R. Q. (2012). *The contributions of* mathematical knowledge for teaching, mathematics teacher self-efficacy, and a *social-emotional learning intervention on mathematics instructional quality*. Manuscript submitted for publication.

Peetsma, T., Hascher, T., van der Veen, I., & Roede, E. (2005). Relations between adolescents' self-evaluations, time perspectives, motivation for school and their achievement in different countries and at different ages. *European Journal of Psychology of Education*, *20*, 209–225. doi:10.1007/BF03173553

Pianta, R. C., Belsky, J., Vandergrift, N., Houts, R., & Morrison, F. J. (2008). Classroom effects on children's achievement trajectories in elementary school. *American Educational Research Journal*, *45*(2), 365–397. doi:10.3102/0002831207308230

Pianta, R. C., LaParo, K. M., &Hamre, B. (2008). *Classroom Assessment Scoring System (CLASS) manual*, K–3. Baltimore, MD: Brookes.

Pianta, R. C., & Hamre, B. K. (2009). Conceptualization, measurement, and improvement of classroom processes: Standardized observation can leverage capacity. *Educational Researcher*, *38*(2), 109–119. doi:10.3102/0013189X09332374

Pianta, R. C., Belsky, J., Houts, R., & Morrison, F. (2007). Opportunities to learn in America's elementary classrooms. *Science*, *315*(5820), 1795–1796. doi:10.1126/science.1139719

Ransford, C. R., Greenbeg, M. T., Domitrovich, C. E., Small, M., & Jacobson, L. (2009). The role of teachers' psychological experiences and perceptions of curriculum supports on the implementation of a social and emotional learning curriculum. *School Psychology Review, 38,* 510–532. Retrieved from http://tinyurl.com/3ejprn4

Raver, C. (2004). Placing emotional self-regulation in sociocultural and socioeconomic contexts. *Child Development, 75*(2), 246–253. doi:10.111/j.1467-8624.2004.00676.x

Rimm-Kaufman, S. E., Fan, X., Chiu, Y., & You, W. (2007). The contribution of the Responsive Classroom approach on children's academic achievement: Results from a three year longitudinal study. *Journal of School Psychology*, *45*(4), 401–421. doi:10.1016/j.jsp.2006.10.003

Rimm-Kaufman, S. E. & Hamre, B. (2010).The role of psychological and developmental science in efforts to improve teacher quality. *Teacher College Record, 112*(12), 2988–3023.

Rinehart, J. S., Short, P. M., Short, R. J., &Eckley, M. (1998). Teacher empowerment and principal leadership: Understanding the influence process. *Educational Administration Quarterly*, *34*, 630–649. doi:10.1177/0013161X980341004

Robinson, V. M. J., Lloyd, C., & Rowe, K. (2008). The impact of leadership on student outcomes: An analysis of the differential effects of leadership types. *Educational Administration Quarterly*, *44*, 635–674. doi:10.1177/0013161X08321509

Rosenholtz, S. (1986).The organizational context of teaching and learning. In *Learning to teach*. Champaign-Urbana, IL: University of Illinois.

Sirin, S. R. (2005). Socioeconomic status and academic achievement: A meta-analytic review of research. *Review of Educational Research*, *75*(3), 417–453. doi:10.3102/00346543075003417

Stodolsky, S. S., Salk, S., & Glaessner, B. (1991). Student views about learning math and social studies. *American Educational Research Journal*, *28*(1), 89–116. doi:10.2307/1162880

Virginia Department of Education. (2010). *Standards of learning*.

Wanless, S. B., Larsen, R., & Son, S.-H. (2011, October). Multi-group analyses in cross-cultural research: Remaining open to cultural differences in the age of globalization. In D. Post (Chair), *Transformative learning and teaching: innovative practices.* Paper presented at the Comparative and International Education Society's (CIES) Eastern Regional Conference, Pittsburgh, Pennsylvania.

Waters, J. T., Marzano, R. J., & McNulty, B. A. (2003). *Balanced leadership: What 30 years of research tells us about the effect of leadership on student achievement*. Aurora, CO: Mid-continent Research for Education and Learning. Retrieved from http://tinyurl.com/3aph68q

Westwood, P. (2008). *What teachers need to know about teaching method*. Melbourne. Australia: Australian Council for Educational Research.

Yates, G., & Yates, S. (1990). Teacher effectiveness research: Towards describing user-friendly classroom instruction. *Educational Psychology*, *10*(3), 225–238. doi:10.1080/0144341900100304

Zamel, V. (1987). Recent research on writing pedagogy. *TESOL Quarterly*, *21*(4), 697–715. doi:10.2307/3586990

CHAPTER 5

INSTRUCTIONAL LEADERSHIP BEHAVIORS

The Impact on Teachers' Classroom Instruction

Kristi E. Wagner and Charles A. Wagner

ABSTRACT

The SURN Principal Academy was designed to build principals' knowledge of high-yield instructional strategies (Hattie, 2009); to increase their expertise with tools in order to collect evidence of classroom teaching and learning and provide immediate feedback to teachers; and to facilitate collaborative observation conferences in order to engage teachers in reflection and professional learning and improve classroom instruction. An evaluation of the SURN Principal Academy indicated that rates of instructional observations increased among participating principals. Teachers who reported higher frequencies of instructional interactions with their principals reported a greater degree of instructional change. A positive correlation was found between teachers' perceptions of principal support and instructional change, while perceptions of principal support related to instruction were higher with

Leadership and School Quality, pp. 91–114

increased frequency of principal interactions. Teachers reported that feedback, supportive, modeling, and engagement behaviors of their principals positively impacted their instruction.

THE SURN PRINCIPAL ACADEMY

The School University Research Network (SURN) is a partnership between The College of William and Mary's School of Education and 28 K–12 school divisions to identify and conduct relevant research and professional development that promotes quality teaching and learning. The SURN Principal Academy is one element of the broader SURN professional learning enterprise that includes several companion programs for teachers, as well as a new program developed in 2014–15 to train central office administrators in providing more aligned vertical support for principals and teachers involved in SURN initiatives. Much of SURN's ongoing research on teaching and learning is founded upon Hattie's (2009) research on high-yield instruction and feedback, as well as ongoing needs assessments provided by partner school divisions.

The SURN Principal Academy originated in 2012 in response to feedback from SURN superintendents who expressed a need for professional development and support for new administrators within their districts. This role novelty, inexperience, and diversity of background and preparation among new administrators resulted in the development of a comprehensive professional learning experience for principals, designed specifically to strengthen instructional leadership capacity, supervisory skills, and a professional network of job-alike colleagues working and learning together to resolve problems of practice.

Background

A broad body of research already has established that principals influence student achievement indirectly through the work of classroom teachers (Hallinger & Heck, 1996; Leithwood, Seashore, Louis, Anderson, &Wahlstrom, 2004; Marzano, Waters, & McNulty, 2005; Robinson, Lloyd, & Rowe, 2008). It stands to reason, therefore, that both the quantity and quality of interactions between principals and teachers are significant. This chapter examines an evaluation study of one element of the SURN Principal Academy that focused on supervision of instruction: more specifically, the extent to which principals' instructional leadership behaviors influenced teachers' classroom practices and perceptions of principals' support. First, we describe briefly the evolution and context of instructional

leadership and the impact of principal instructional leadership behaviors on teacher practices and student achievement.

WHAT IS INSTRUCTIONAL LEADERSHIP?

School principals today must possess and demonstrate an increasingly complex and diverse set of technical and adaptive leadership skills. In the late 1980s, the term "instructional leader"first emerged from the national education reform movement. The federal No Child Left Behind (NCLB) Act of 2001 firmly shifted the primary role of school principal from more managerial functions and behaviors toward school improvement, instructional leadership, and supervision (Goodwin, Cunningham, & Eagle, 2005). Effective principals today recognize the complicated dynamics of school organizations and work deliberately in ways that promote innovative and healthy learning environments that positively impact school performance (Hoy, 2012).

Dimensions Of Instructional Leadership

The essence of instructional leadership itself suggests that the more focused a principal's work is on the processes of teaching and learning, the more positive the influence on student outcomes will be (Robinson et al., 2008). Instructional leadership, therefore, is a deliberate process of behaviors and practices that promote teacher instructional improvement and effectiveness and are tightly aligned to student outcomes (Alig-Mielcarek & Hoy, 2005; Robinson et al., 2008; Supovitz & Buckley, 2008).

Alig-Mielcarek and Hoy's (2005) model of instructional leadership was developed through the synthesis of the leading instructional leadership models and consists of three primary dimensions: defines and communicates shared goals, monitors and provides feedback on the teaching and learning process, and promotes school-wide professional development. Because of its synthesis of the literature and simplified dimensions, this model of instructional leadership served as the framework for the program evaluation of the SURN Principal Academy; the dimensions of this model are examined below in brief detail.

Defining and communicating shared goals. Effective instructional leaders establish a clear vision and direction for the school and develop specific goals that are shared and valued by stakeholders (Alig-Mielcarek & Hoy, 2005; Hallinger & Murphy, 1985; Murphy, 1990; Robinson et al., 2008; Weber, 1996). Robinson and her colleagues (2008) describe this practice as the "determined pursuit of clear goals which are understood by and

attractive to those who pursue them" (p. 666). The notion of shared goals cannot be overstated: a common vision is based on the collaboration and cooperation of others; therefore, values must be shared among stakeholders (Hallinger, 2011).

Instructional leaders also demonstrate the ability to analyze and interpret school performance data to ensure goals are relevant, understood, and translated into classroom practices that result in improved student outcomes (Alig-Mielcarek & Hoy, 2005; Robinson et al., 2008). Goals should be clearly defined, academically focused, challenging, and attainable. Effective instructional leaders consistently communicate these goals, monitor progress, and provide ongoing feedback to impact classroom practices. Shared vision and goals rank as the second most significant instructional leadership skill related to student outcomes (Robinson et al., 2008).

Monitoring and providing feedback on the teaching and learning process. Effective instructional leaders foster an academic school climate focused on teaching and learning, which includes both coordinating and evaluating the curricula and instructional program (Robinson et al., 2008). Hallinger (2011) describes monitoring the instructional program as a"persistent focus on improving conditions for learning and creating coherence in values and action across classrooms day in and day out" (p. 137). Consistent classroom observations help to ensure a number of essential school performance indicators: lessons and curriculum aligned with state and district standards and district and school-wide vision and goals; the utilization of high-yield instructional strategies; and the consistent use of teacher and student performance data to guide instruction and monitor student progress (Alig-Mielcarek & Hoy, 2005; Hallinger & Murphy, 1985; Murphy, 1990). Instructional leaders in high performing schools "work directly with teachers to plan, coordinate, and evaluate teachers and teaching" (p. 663). As a result, teachers are more likely to value and use this feedback to inform and improve their instruction (Robinson et al., 2008).

Supervision of instruction requires more than symbolic classroom observations (Murphy, 1990). Effective instructional leaders demonstrate an ability to identify, describe, and model high-yield instructional strategies and encourage skillful and appropriate use of these strategies to positively impact student learning (DiPaola & Hoy, 2008; Hattie, 2009; Stein & Spillane, 2005).

Promoting school-wide professional development. Effective instructional leaders recognize the importance and value of professional learning for teachers. However, simply promoting and encouraging professional development is not enough: active participation of school leaders in profes-

sional development is necessary to establish credibility and assist teachers in translating learning into effective classroom practice (Robinson et al., 2008).

Robinson and her colleagues found significantly higher achievement outcomes (*ES* = .84)in schools where teachers reported their leaders were active participants in professional learning. Creating a school culture focused on continuous improvement through professional learning is a significant component of instructional leadership and this ability requires an understanding of adult learning, modeling, and differentiated strategies to accommodate diverse teacher learners (DiPaola & Hoy, 2008; Hallinger & Murphy, 1985; Robinson et al., 2008; Stein & Nelson, 2003).

Instructional Leadership and Student Outcomes

Several comprehensive meta-analyses have linked instructional leadership to student outcomes. Hallinger and Heck (1996) concluded from a review of 43 empirical studies that the principal's instructional leadership behaviors indirectly and positively impacted school climate, culture, and organization. School mission, goals, and high academic expectations were instructional leadership behaviors that manifested themselves in classroom instruction to positively impact student outcomes (Hallinger & Heck, 1996).

In their review of school leadership and student outcomes, Leithwood et al. (2004) concluded "leadership is second only to classroom instruction among all school-related factors that contribute to what students learn at school" (p. 5). The study further revealed that impacts of leadership are underestimated and the combination of direct and indirect effects accounts for approximately 25% of total school effectiveness (Leithwood et al., 2004).

In their meta-analysis of more than 70 studies, Marzano et al. (2005) found 21 key leadership practices that correlated with student achievement, including establishing clear goals, monitoring/evaluating school practices on learning, and a culture of "shared beliefs and sense of community and cooperation" (p. 4). The authors noted that one standard deviation of improvement in these school leadership practices was associated with a 10% gain in student achievement (Marzano et al., 2005).

Robinson et al. (2008) grouped measurement items to reflect common leadership practices. From 27 studies published between 1978 and 2006, the authors found that practices associated with establishing school goals, supervision of instruction, and professional learning were highly impactful and concluded, "the more leaders focus their relationships, their work, and their learning on the core business of teaching and learning, the greater their influence on student outcomes" (Robinson et al., 2008, p. 636).

Instructional Leadership That Impacts Teachers' Instructional Practices

As we have seen, the principal is responsible for creating school conditions that are focused on student learning outcomes (Hallinger, 2011; Hoy, 2012; Hoy & Miskel, 2013). The meta-analyses demonstrate that school leadership—and specifically instructional leadership—positively impacts student achievement; principals clearly play an essential role in improving student learning (Hallinger & Heck, 1996; Leithwood et al., 2004; Marzano et al., 2005; Robinson et al., 2008).

Multiple educational studies in the last 15 years have demonstrated the significance of high-quality, focused principal-teacher interactions about specific instructional strategies on student outcomes (Blasé & Blasé, 1999; May & Supovitz, 2011; Robinson et al., 2008; Sheppard, 1996; Supovitz & Buckley, 2008; Supovitz et al., 2009). Sheppard (1996) concluded there is a positive relationship between the instructional leadership behaviors of the principal and teachers' innovation, creativity, professionalism, and commitment to school and colleagues. Blasé and Blasé (1999) uncovered two significant themes from the teachers' perspective that impacted their motivation, creativity, efficacy, and their varied use of instructional strategies. First, when principals engaged in discussions with teachers about instruction, the dialogue promoted teacher reflection. Second, when principals supported collaboration among teachers to study teaching and learning, as well as opportunities for teachers to plan and facilitate quality professional learning aligned with adult-learning principles, the reflective attitudes and behaviors of classroom teachers improved significantly (Blasé & Blasé, 1999).

High-leverage feedback. Feedback is described as "information provided by an agent (e.g., teacher, peer, book, parent, self, experience) regarding aspects of one's performance or understanding" (Hattie & Timperley, 2007, p. 81). *High-leverage feedback* is "carefully chosen feedback that is delivered in a way that makes recipients more likely to be responsive to change" (Supovitz & Buckley, 2008, p. 5). Feedback is most effective when it is detailed, nonjudgmental, low risk, and based on specific classroom behaviors (Blasé & Blasé, 1999; Hattie & Timperley, 2007). Essentially, the purpose of feedback is to facilitate a change in others: both the content of the feedback and the method of feedback delivery are important (Hord & Hall, 1987; Hattie & Timperley, 2007; Kluger & DeNisi, 1996).

Supovitz and Buckley (2008) refer to these feedback behaviors as "high-leverage instructional leadership: evidence-based feedback given by principals that induces teachers to examine their instruction in order to improve the effectiveness of their practice" (p. 5).

They go on to suggest that high-leverage instructional leadership that provides evidence-based classroom feedback facilitates teachers' examination of instructional practices for improvement and is more likely to evoke a change in classroom instruction.

Scope of principals' instructional leadership. Principals' instructional leadership behaviors can range from very broad actions such as whole-faculty discussions to more specific targeted activities with individual teachers. This range of instructional leadership is referred to as *scope* (May & Supovitz, 2011). Broad instructional leadership activities, such as school-wide goal setting, are important but have less measurable impact on individual teacher's instructional practices. Targeted instructional leadership activities, such as providing specific feedback about an observed lesson, are more likely to change an individual teacher's practices. Teachers who reported the highest frequency of principal interactions also reported the largest scale of instructional changes; these results strongly suggest that a principal's influence on instructional improvement is significantly related to their interactions with individual teachers (May & Supovitz, 2011). In general, the time a principal specifically allocates to instructional leadership activities is a predictor of positive classroom instructional change.

Need for Instructional Leadership Development

Although indirect, the established relationship between instructional leadership behaviors and student achievement highlights the importance of the principal's instructional leadership skills (Hallinger & Heck, 1996; Leithwood et al., 2004; Marzano et al., 2005; Robinson et al., 2008). School leaders need to support teachers, who in turn support students (Darling-Hammond, LaPointe, Meyerson, & Orr, 2007). Principals clearly play an essential role in improved student learning by impacting teachers' classroom practices (Blasé & Blasé, 1999; May & Supovitz, 2010; Sheppard, 1996; Supovitz & Buckley, 2008; Supotvitz et al., 2010).

Principals enter their professional roles with required certifications but limited job-embedded support to further develop and refine instructional leadership skills and practices (Darling-Hammond et al., 2010). NCLB makes no accommodations for school leadership experience: even first-year principals are held to the same expectations for school performance as more experienced principals (NCLB, 2001).

Several recent studies on professional learning for principals, however, suggest that instructional leadership is fully developed in practice, over time, and integrated into daily work (Gallucci & Swanson, 2008; Honig, 2012). Sustained, job-embedded, focused professional learning for principals designed to improve their instructional leadership practices should be a

priority for school districts looking to improve student outcomes (Darling-Hammond et al., 2010).

In-service, "career staged" programs vary widely in the degree and level of instructional leadership support they provide and often lack a consistent and systematic approach to professional learning. In addition, professional development programs require significant financial and human resources from both program developers and participants, and the lack of evaluative data on the effectiveness of such initiatives impedes informed decision-making (Darling-Hammond et al., 2010; Peterson, 2002). School districts and program developers with limited resources must consider the emerging research on effective program elements in order to purposefully pursue a program that includes components with demonstrated outcomes.

PROGRAM THEORY

In the field of education, it is generally believed that high-quality professional development will improve instruction (Goldring, Huff, Spillane, & Barnes, 2009). Although education research has typically focused on teacher professional development to improve instructional practices and student outcomes, principals' instructional leadership expertise can be improved through high-quality professional development specifically designed for school leaders. Principals who operate as instructional leaders aim to increase instructional effectiveness in their schools through interactions with teachers in a formative process of supervision. Supervision of instruction provides teachers with objective, data-driven feedback to improve their instructional practices (Alig-Mielcarek & Hoy, 2005; Blasé & Blasé, 1999; DiPaola & Hoy, 2008; May & Supovitz, 2011; Supovitz & Buckley, 2008; Supovitz, Sirinides, & May, 2010). Supervision of instruction requires principals to provide high-leverage feedback on classroom performance;that is, purposeful, classroom, evidence-based feedback, designed to initiate reflection, identify areas for improvement, and facilitate changes in teachers' instructional practices (Supovitz & Buckley, 2008). Over time, as teachers change their classroom practices and become more effective, principals refine their leadership focus and adjust feedback. Although not measured within this program, these principal-teacher interactions should ultimately impact student achievement (Blasé & Blasé, 1999; May & Supovitz, 2011; Supovitz & Buckley, 2008; Supovitz et al., 2010). This proposed pathway to increased instructional effectiveness is demonstrated in Figure 5.1.

The Principal Academy professional learning series is designedto develop principals' instructional leadership skills through a series of learning modules that promote understanding of high-yield instructional

strategies (Hattie, 2009). Academy participants use digital observation tools to collect evidence of high-yield strategies, conduct pre/post-observation conferences with teachers, and implement professional goal setting that targets more effective utilization of high yield strategies. The observation tools are tightly aligned with indicators of high-yield instructional strategies and allow principals to provide immediate, data-driven, focused instructional feedback to teachers (Hattie, 2009).

The SURN Principal Academy consists of an initial three-day summer institute for participants and four follow-up sessions during the school year. Principals are expected to participate in a series of job-embedded activities between the follow-up professional development days, including conducting collaborative observations with Academy colleagues and mentors, facilitating professional development activities and a book study with their faculty, completing observations in their schools using the electronic data collection tools, and engaging in action research to demonstrate the impact of their interventions.

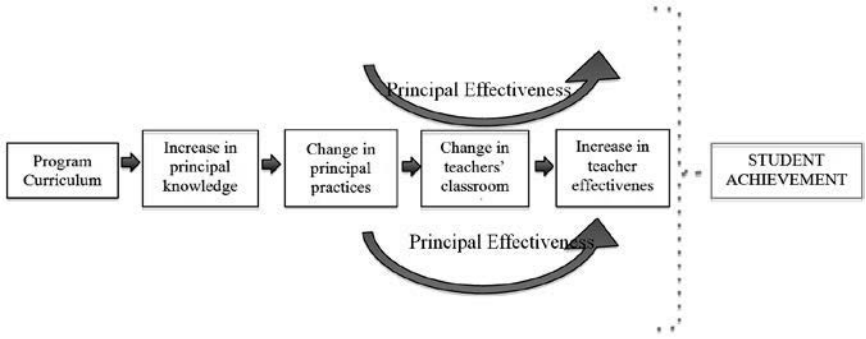


Figure 5.1. Program theory.

THE EVALUATION STUDY

The following evaluation questions were designed to elicit essential information to provide an evaluation report focused on mid-range program outcomes in this summative, mixed-methods evaluation:

1. To what extent have principals acquired the instructional leadership knowledge and skills necessary to change their instructional supervision?
2. To what extent do principals engage in instructional leadership practices?

3. To what extent do principals' instructional leadership behaviors and practices impact teachers' instructional practices?

Multiple data sources, including a focus group interview, individual participant interviews, the observation database, and teacher surveys were examined to explore the extent to which principals acquired instructional leadership knowledge and skills, engaged in instructional leadership practices, and the resulting impact of those practices on instruction. The mixed-methods approach provides opportunities for increasing data validity through triangulation, or the "use of multiple and different sources, methods, investigators, and theories to provide corroborating evidence" (Creswell, 2013, p. 251).

Study Participants and Instruments

During the year of the study, participating principals were identified from two different sources. SURN partner school divisions selected one principal or assistant principal to attend the program; those principals or assistant principals who completed the initial program year were invited to remain for a second year. In addition, the Virginia State Department of Education (VDOE) Office of School Improvement (OSI) identified principals from low achieving schools and mandated their attendance. Collectively, there were 33 principals in year one (Y1) of the program and 17 administrators continued as year-two (Y2) participants. Ten participants served as mentors, along with four members of the leadership team.

As part of their required Academy expectations, principals selected 20 teachers as the focus of their supervision and observation data collection, including a confidential electronic survey. Of the 898 teachers identified by principals for classroom observations, 360 (40%) responded to the teacher survey containing a combination of select response and open response items. Descriptive statistics were utilized to gather data pertaining to the frequency of reported instructional leadership interactions with their principals, teachers' self-reported instructional change, and teachers' perceptions of principals' support. Teacher perspectives on impactful instructional leadership behaviors were reported in the Inventory of Strategies Used by Principals to Influence Classroom Teaching (ISUPICT), incorporated in the supply response section of the survey.

FINDINGS

Acquisition of Skills

Individual interviews and a focus group with the SURN Principal Academy leadership team members, Academy Director, and Academy

Coordinator provided data related to the acquisition of participants' instructional leadership knowledge and skills—more specifically, the accurate and appropriate identification of high-yield instructional strategies (Hattie, 2009). Interview questions were designed to elicit specific evidence of Academy principals demonstrating an increase in instructional leadership knowledge, skills, and practices. For example, focus group and interview participants were asked to share,"What evidence, if any, have you observed of principals applying instructional leadership skills? Please share specific examples you may have observed in the field. How does that evidence reflect the principal's instructional leadership?" The interview with the academy director and coordinator also included probes and follow-up questions based on emerging themes from the analysis of the leadership team focus group transcripts. The conversations were recorded and transcribed then reviewed against the audio recordings to ensure accuracy. A code list was prepared based on significant instructional leadership themes represented in the program theory and Alig-Mielcarek and Hoy's (2005) model of instructional leadership. These a priori codes provided a framework initial analysis in DeDoose, a qualitative coding software, to standardize the iterative coding process and increase the overall validity and reliability. These initial memos[1] and a priori codes were employed for "lean coding" followed by an additional round to capture emerging codes. Transcripts were analyzed in a final round utilizing the updated codes (Creswell, 2013).

The analysis of focus group and interview data revealed multiple examples of principals acquiring instructional leadership skills related to program goals. Examples fell primarily within three main categories:

- Academy sessions to "unpack" high-yield instructional strategies such as indicators of student engagement;
- Collaborative observations with colleagues and interdistrict networking; and
- Principals in their home schools leading or facilitating professional development related to high-yield instructional strategies.

During each of the interviews, participants shared examples of building an understanding of high-yield instructional strategies and indicators of student engagement. Principals deepened their understanding of student engagement through Academy sessions where participants "really broke [student engagement] down," had "deep discussions about what it truly looks like," and arrived at a "common understanding." Participants described watching videos, collecting data using the electronic observation protocols, and discussing their findings that built an initial understanding prior to observing in classrooms. During discussions, participants described

observations protocols as "tools" and "tools matter ... tools help people make sense of difficult work." Academy leaders monitored the observation database and analyzed data for emerging trends, evidence of mastery, and any remaining gaps in participants' knowledge. The data analysis was the basis for subsequent professional development with the participants. This "tuning" process and trend analysis was utilized to refine understanding and application of high-yield instructional strategies in classrooms.

Collaborative observations were consistently identified as a means to increase interrater reliability through development of common definitions of student engagement indicators among Academy participants. Collaborative observations were defined as principals observing classes together at various schools. Many interviewees described this as the most powerful element of their learning. Academy leaders described this phenomenon as a tuning process where Academy participants made continuous and determined efforts to visit classrooms, focus on high quality instruction, and provide feedback to teachers while continuing to refine their own understanding. In addition to observing with one another, Y2 participants also enlisted teacher leaders in their schools to conduct collaborative peer observations. The results were described by one participant: "The whole idea of looking for evidence of student learning doesn't really just belong with the principal; that whole idea belongs to the school … this is really everybody's business."

Additionally, there were multiple examples of principals extending their learning by leading or facilitating professional development activities focused on student engagement with teachers in their schools. The development of shared vocabulary was described as a "powerful" foundational component necessary for the principals, but also for teachers to understand principals' expectations for high-yield instructional strategies. One participant described the role of the principal: "The instructional leader is the professional developer of the building." Academy leaders indicated sessions were designed to model high-quality professional learning and support principals with resources to lead professional learning.

Supervision of Instruction Increased

The online observation database provided information about the frequency of classroom observations and feedback data provided to teachers using the SURN observation protocols; both of these are associated with effective instructional leadership practices (Alig-Mielcarek & Hoy, 2005). Using the number of submitted observations in the database, an observation rate was calculated for each participant based on the 20-teacher

requirement. For example, a principal who completed 25 observations in November would have an observation rate of 1.25 observations per teacher at the first data collection point. The observation rate was again calculated in February based on the cumulative number of observations completed. Table 5.1 outlines the observation rates of Academy participants in November and February and net changes in these rates. Although slower to start, the high school administrators demonstrated a significant increase in the rate of observations by February and matched the observation rate of their elementary colleagues.

Table 5.1. Observation Rates by School Level, Cohort, and Entry Point

	Observation Rate		
	November	*February*	*Net Change*
School Level			
Elementary	.91	1.60	+.69
Middle	.55	.98	+.43
High	.48	1.60	+.79
Cohort Group			
Year One (Y1)	.75	1.27	+.70
Year Two (Y2)	.65	1.35	+.52
Entry Point			
OSI	.45	.93	+.48
Consortium	.78	1.37	+.59
Mentors	.68	1.64	+.96

Note. Observation rate is calculated by dividing the number of observations by 20 to represent an observation rate for each principal.

Section 1: Frequency of Interactions Increased

Section 1 of the teacher survey consisted of 18 closed-ended items utilized in a previous study designed to examine the scope of principals' instructional leadership practices to improve classroom instruction (May & Supovitz, 2010). The teachers reported frequency of interaction with their principal from 1 (*never*) to 5 (*more than 2 days a week*) in each of the following five categories: (1) The principal and the teacher discussed the teacher's instruction; (2) The principal observed the teacher instructing a class; (3)

The teacher observed the principal instructing a class; (4) The principal provided feedback after observing the teacher's instruction; and (5) The principal reviewed the work produced by a teacher's students. Subjects were also grouped into three frequency categories based on their reported interactions: *No Contact* described teachers who reported no interactions in any of the five categories; *Some Contact* included teachers who reported interacting with their principal a few times each year in at least one of the five categories; and *High Contact* described those teachers who reported interacting with their principals at least a few times each month in any of the five categories (May & Supovitz, 2010). Of those who responded, 40.3% reported some contact in at least one of the categories during this school year and 55.8% of teachers reported high contact with their principal in one or more categories during the program year. Table 5.2 outlines the frequency groups by school level during the program.

Table 5.2. Frequency of Interaction Groups by Level

Level		*Frequency*	*Percent*
Elementary School	No contact	1	.8
	Some contact	28	22.6
	High contact	95	76.6
	Total	124	100.0
Middle School	No contact	2	2.0
	Some contact	44	44.9
	High contact	52	53.1
	Total	98	100.0
High School	No contact	9	10.2
	Some contact	53	60.2
	High contact	26	29.5
	Total	88	100.0

Of the 310 survey respondents, 167 indicated being observed by the same principal during the previous school year. These respondents also indicated their frequency of interactions during the prior year. A case-by-case analysis revealed that 25 of the 167 teachers who reported the same prior-year principal changed frequency groups: five teachers moved from *No Contact* to *Some Contact*, and 20 teachers moved from *Some Contact* to *High Contact*. Conversely, 10 of the 167 teachers reported a decrease in frequency of principal interactions during the program year: three teachers moved from *High Contact* to *Some Contact* while seven teachers decreased

from *Some Contact* to *No Contact*. This small percentage of teachers reporting no contact with their principals was also reflected in the supply response section of the survey.

In addition to frequency groups, an average frequency score was calculated to allow an additional comparison between current and previous year frequency of interaction scores. The mean of current year frequency interactions rating was 2.12, while the previous year mean frequency of interaction rating was 1.97. A two-tailed, paired sample *t*-test was run to test for significance in the mean scores. Results indicated $t(166) = 4.40$, $p < .01$, $N=167$.

Section 2: High Contact Yielded a Statistically Significant Degree of Instructional Change

Mean instructional change scores were derived from the responses to the seven instructional change items in Section 2 of the teacher survey (May & Supovitz, 2010). The instructional change items on the teacher survey were designed to measure the extent to which teachers changed aspects of their instruction, such as the types of formative assessments, student grouping, instructional strategies used, and the kinds of questions asked to students.

Teachers responded to the categories[2] using a 7-point scale from 1 (*not at all*) to 7 (*a great deal*). These mean scores were the basis for correlational analysis to determine if there was a positive relationship between teachers' perceptions of principals' support and teachers' change in instructional practices, as well as an analysis of mean variances (ANOVA) between frequency groups. The mean instructional change was 4.51, with a standard deviation of 1.34. An analysis of variance (ANOVA) resulted in $F(2,309) = 8.337$, $p< .05$, partial $\eta^2 = ?$. Post hoc comparisons using the least significant difference (LSD) test indicated a significantly higher level of instructional change in the *High Contact* frequency group as compared to the *No Contact* and *Some Contact* groups. There was no statistically significant difference in instructional change found between the *No Contact* and *Some Contact* groups.

Section 3: Teachers' Perception of Principals' Support of Instruction

Section 3 of the teacher survey was comprised of the four items from the Principal Support Scale (PSS) appraisal section (DiPaola, 2012). Appraisal items are designed to measure teachers' perceptions of principals' support that improves teacher performance. Appraisal support is demonstrated

by providing feedback that encourages teacher reflection and improved classroom practices—arguably a demonstration of instructional leadership (DiPaola, 2012). Teachers were asked to respond to the following items using a 6-point Likert scale from 1 (*strongly disagree*) to 6 (*strongly agree*):

1. My principal offers constructive feedback after observing my teaching.
2. My principal provides frequent feedback about my performance.
3. My principal helps me evaluate my needs.
4. My principal provides suggestions for me to improve instruction.

A mean score of the PSS appraisal items represented a teacher's perception of the principal's support of teaching performance. An ANOVA was utilized to determine if the mean differences in PSS scores between the frequency groups was significant. The ANOVA resulted in $F(2,309) = 59.388$, $p < .05$, partial $\eta^2 = ?$. Post hoc comparisons using the LSD test indicated that teachers in the *High Contact* group perceived a statistically significant higher level of principal support for instruction than teachers in the *Some Contact* and *No Contact* groups. Teachers in the *Some Contact* group also had statistically significantly higher perceptions of principal support than *No Contact* teachers.

Section 4: Principals' Behaviors That Impacted Teachers' Instruction

Section 4 of the survey, the ISUPICT, consisted of five open-ended items designed to study instructional leadership characteristics that impact the classroom practices of teachers from the perspective of teachers (Blasé & Blasé, 1999). Teacher responses to Section 4 provided a rich source of data to explore the impact of specific instructional leadership practices. Example items from the ISUPICT asked teachers to:

1. Describe and give a detailed example of a positive characteristic (overt or covert, formal or informal) that your instructional supervisor uses frequently to influence what you think or do that directly improves something about your classroom teaching.
2. Describe and give a real-life example of the effects (impacts) that the characteristic has on your thoughts (related to teaching) and behavior (related to teaching).

Teacher responses were analyzed using qualitative, inductive coding methods for emerging patterns and themes related to the evaluation

questions. Teacher responses to Section 4 provided a rich source of data to explore the impact of specific instructional leadership practices. To increase validity and reliability of the qualitative coding process, Dedoose was utilized for the coding and analysis of the teacher supply response items. In addition, an expert in the field of instructional leadership reviewed codes and any unclear teacher statements. Table 5.3 provides the frequencies of the most reported positive characteristics, as well as brief explanations of each code.

Table 5.3. Positive Characteristics That Teachers Report Influence Classroom Teaching

Frequency	*Code*	*Description*
83	Provides Feedback	The principal provided written or verbal feedback on the teacher's classroom instruction,student work, or behavior that clarified expectations and goals.
59	Supportive	The principal supported teachers' instruction, provided resources, and encouraged risk-taking while providing a safe, non-threatening environment for adult learning.
47	Modeling	The principal was knowledgeable and modeled instructional strategies, professional expectations, or other behaviors related to school goals, including, but not limited to, leading/facilitating professional learning.
27	Engaged	The principal was visible in classrooms and around the school, observing instruction, interacting with students, teachers and parents, actively engaged in meetings and workshops, and accessible.

Impactful Principal Behavior: Feedback

Providing feedback was the most frequently cited positive characteristic that teachers reported as impacting their instruction. Teachers described principal feedback in a variety of ways, but almost always related to classroom observations. *"Feedback on instruction focuses on making sure goals are aligned with strategies being used and student engagement."*Feedback was verbal or written, face-to-face or electronic, formal or informal, but described as timely, specific, constructive, and "nonthreatening."

According to the teacher survey, feedback had a mean effectiveness rating of 5.26, with a rating of six being the most effective. Moreover, even

though feedback was not always complimentary, it was perceived as "useful" and "motivating" if provided in a nonthreatening, constructive manner. Teachers explained that feedback is a means for "clarifying expectations" and important for their understanding to improve instruction and meet expectations. As a result of feedback, teachers described feeling "motivated" to make instructional changes and improve their practice because they were more "confident" in their ability to meet expectations. One teacher's comments summarized the importance of feedback: "Without feedback, one can go an entire year with little improvement because there's no clarity in the intended goal. With feedback, it makes it easy to adjust instruction accordingly."

Impactful Principal Behavior: Support

The second most reported positive characteristic that impacts classroom instruction was a supportive principal. Principals who were described as supportive often encouraged their teachers to try new strategies, were nonjudgmental, responsive, and "pitched in" wherever and whenever there was a need within the school community. Support was defined in a variety of forms: teachers explained specific examples of principals who were engaged in classroom projects, student activities, and new initiatives by providing tools, resources, and opportunities. One teacher described it as follows: "My principal provides opportunities for professional development and supports me when I want to try something new in my classroom." These principals also were described as offering reassurance and emotional support for teachers as professionals and encouraging teachers to take risks without fear of repercussions. Another teacher wrote: "The more supportive that she is, the more confident that I am knowing that she 'has my back.' This gives me the confidence to try new and different teaching techniques." Supportive principals were often portrayed as good listeners, receptive to others' ideas, and inclusive decision-makers: "Knowing that I have a principal who is willing to take risks and allow me to take risks in the classroom to benefit student achievement has made me adapt my teaching style to a wider audience. His support is encouraging."

Teachers who described their principals as supportive felt their principal genuinely wanted them to be successful "as a teacher and a person;" therefore, the teachers reported feeling positive, comfortable taking professional risks, and inspired, confident, and "better able to support students." One teacher summarized, "I don't feel like I will be completely penalized in some way if I fail when trying something new in the classroom."The mean effectiveness rating of supportive principal behaviors was 4.97 out of a possible 6.0.

Impactful Principal Behavior: Modeling

The third most frequent characteristic impacting classroom instruction was modeling. Modeling had a mean effectiveness rating of 5.10 out of 6. Principals modeled instructional strategies related to research or school goals during professional development, staff meetings, and teacher conferences. Multiple teachers cited specific examples of a "Hattie book study" which included the principal demonstrating instructional strategies. Principals who used modeling were described as "knowledgeable" and "experienced." Principals provided "concrete examples" based on their classroom experiences, which teachers termed "relevant" and "inspiring." As a result, teachers reported having a "clear understanding" how to implement strategies into their lessons, one teacher stated, "examples and modeling provide us with more clear-cut expectations as to how to meet and exceed expectations."Teachers felt "more comfortable" and "encouraged" to try new strategies and "motivated" to step out of their "comfort zone" when the principal "illustrate[d] what it is that he expects."

Teachers also described principals as consistently modeling "positive attitudes" and demonstrating "positive interactions" in variety of circumstances with students, parents, and staff members. These consistent positive interactions "set the tone" of the school and created a "positive climate" for students and staff members. The principal was often labeled as a "role model" who set the expectations in the building. Teachers described being "more patient" and "more positive" with their "challenging" students and forming "better relationships" because of the consistently positive interactions the principal modeled in complex situations. One teacher reported: "This has directly affected my relationship with my students, as well as with colleagues. My principal leads by example, she often models what she expects from us as teachers and sets the bar for expectations."

Teachers described engaged principals as "dedicated" and "involved" in all aspects of the school. Principals were portrayed as "active participants" in meetings, professional development, classrooms, "visible" throughout the school, and more accessible to both students and faculty. One teacher described the principal in the following way:

> My principal is very involved with every aspect of the school day. From walking to halls helping students open lockers/quickly get off the bus to their correct location, to observing classroom activities and giving input after doing so, to helping students to the bus. Everything that is done in the building, the principal has a part in it—no matter how small that thing may seem.

Engaged principals often "inspired" and "motivated" teachers to be more involved at school: "I think it makes me want to be more involved myself."

As a result of principals being visible, teachers described being motivated to "consistently provide "engaging powerful lessons" and feeling "in tune" with the principal's expectations. Being engaged had a mean effectiveness rating of 5.11.

IMPLICATIONS FOR PRACTICE

School district leaders, program developers, and school administrators must consider the elements of effective professional development when designing activities and experiences to engage principals and teachers in purposeful, high quality professional growth. To assist school principals and develop their capacity for instructional leadership, school district leaders should support and encourage professional learning experiences such as those provided by the SURN Principal Academy, whose participants deepened their understanding of Hattie's (2009) high-yield instructional strategies through observation protocols in schools, learned about high-quality instructional feedback to teachers based upon learning and engagement evidence, and joined learning communities with job-alike colleagues from other school divisions to discuss experiences and problems of practice (Peterson, 2002).

Building a community of practice easily accessible to principals is important; interview transcripts from this evaluation consistently revealed this practice was "highly beneficial" for Academy participants. Moreover, interviewees referred to the principalship as an"isolating" and "lonely place" and described the Academy's cross-district networking as "more comfortable and somewhat anonymous," and a means to eliminate "uncomfortable competition" that can occur when problem-solving with district colleagues. School organizations of all sizes should acknowledge that principals often work alone and therefore should encourage within- and cross-district collaboration to assist and support professional learning opportunities and, as one interviewee described, to "share struggles in a nonthreatening" environment.

Given the positive impact of principal feedback and modeling on teachers' instructional practices, district leaders can model similar impactful leadership behaviors when working with and supporting principals (Blasé & Blasé, 1999; Hattie, 2009; Hattie & Timperley, 2007). For example, district leaders should partner regularly with principals to jointly review, reflect, and critique specific observational data that principals provide to teachers in an effort to improve the instructional feedback process and foster teacher and principal self-reflection and professional growth. District leaders must be mindful of their own roles as instructional leaders and

model leadership practices and behaviors with the most potential to influence positive instructional changes in principals and teachers.

Principals should be aware that different contexts and conditions within schools require different instructional leadership behaviors. For example, whole-faculty interactions or discussions regarding instructional improvement are likely to have only incremental impact; however, targeted instructional leadership and supervisory behaviors with a smaller subset of teachers, such as those emphasized in the Principal Academy, have much greater potential to produce higher degrees of instructional changes (May & Supovitz, 2010). Teachers reported the frequency of instructional interactions with their principals significantly impacted not only the degree of instructional change, but also teachers' perceptions of a principal's instructional support. Such interactions were necessary to inspire greater instructional changes among teachers, especially when the teachers reported that these interactions occurred regularly or several times each month. Although the results of this evaluation are not generalizable, they are worthy of consideration for principals who wish to target their instructional leadership in order to change teachers' instructional practices.

Data from this evaluation clearly identified the impact of modeling on effective professional growth. During Academy sessions, Academy leaders articulated explicit learning expectations and modeled many of the elements of effective professional learning in the activities they facilitated. Principals should be mindful of these elements and model similar best practices in their schools to maximize application and transfer of new instructional strategies for teachers. Similar to the tuning process principals experienced in the Academy, a continuous focus on the refinement of high-yield instructional strategies (Hattie, 2009) is necessary for teachers. Supervision of instruction is not an event; rather it is an ongoing process of growth, reflection, and improvement facilitated by meaningful and ongoing interactions with instructional leaders.

During initial development of the SURN Principal Academy program, the leadership team identified several mentor principals to work alongside more novice participants to facilitate team-building, tabletop discussions, and to accompany teams on collaborative school visits. Even after the very first Academy experiences, the mentor principals indicated that they had as much to learn about instructional leadership and supervision as their more novice colleagues. In short, it became clear that neither longevity nor experience translated directly into the technical expertise necessary to bring about meaningful instructional change; rather, narrowly focused, ongoing, and job-embedded professional learning experiences for principals—like those in the SURN Principal Academy—are necessary to bring about measureable improvements in classroom practice.

NOTES

1. "Memoing" refers to a qualitative analysis process where the transcript segments are read and the researcher makes notes in the margins related to initial findings in order to gain perspective of the data as whole, prior to a more detailed analysis (Creswell, 2013).
2. In the May and Supovitz (2010) study, the reliabilities for English language arts and mathematics were .94 and .95, respectively.

REFERENCES

Alig-Mielcarek, J. M., & Hoy, W. K. (2005). Instructional leadership: Its nature, meaning, and influence. In W. K. Hoy & C. G. Miskel (Eds.), *Educational Leadership and Reform* (pp. 29–51). Greenwich, CT: Information Age Publishing.

Blase, J., & Blase, J. (1999). Principals' instructional leadership and teacher development: Teachers' perspectives. *Educational Administration Quarterly, 35*(3), 349–378.

Creswell, J. W. (2013). *Qualitative inquiry & research design: Choosing among five approaches* (3rd ed.). Thousand Oaks, CA: Sage.

Darling-Hammond, L., LaPointe, M., Meyerson, D., & Orr, M., (2010). *Preparing principals for a changing world: Lessons from effective school leadership programs*. San Francisco, CA: Jossey-Bass.

DiPaola, M. F. (2012). Conceptualizing and validating a measure of principal support. In M. F. DiPaola & P. B. Forsyth (Eds.), *Contemporary challenges confronting school leaders.* Charlotte, NC: Information Age Publishing.

DiPaola, M. F., & Hoy, W. K. (2008). *Principals improving instruction: Supervision, evaluation, and professional development*. Boston, MA: Pearson/Allyn and Bacon.

Gallucci, C., & Swanson, J. (2008). Aiming high: Leadership for district-wide instructional improvement: A partnership between the Center for Educational Leadership and Norwalk-La Mirada Unified School District. Interim research report and case summary. Seattle: Center for the Study of Teaching and Policy, University of Washington. Retrieved March 15, 2008, from http://depts.washington.edu/uwcel/resources/papers.html

Goldring, E., Huff, J., Spillane, J. P., & Barnes, C. (2009). Measuring the learning-centered leadership expertise of school principals. *Leadership & Policy in Schools, 8*(2), 197–228. doi:10.1080/15700760902737170

Goodwin, R. H., Cunningham, M. L., & Eagle, T. (2005). The changing role of the secondary principal in the United States: An historical perspective. *Journal of Educational Administration and History, 37*(1), 1–17. doi:10.1080/0022062042000336046

Hallinger, P. (2011). Leadership for learning: Lessons from 40 years of empirical research. *Journal of Educational Administration, 49*(2), 125–142. doi:10.1108/09578231111116699

Hallinger, P., & Heck, R. H. (1996). Reassessing the principal's role in school effectiveness: A review of empirical research. *Educational Administration Quarterly, 32*(1), 5.

Hallinger, P., & Murphy, J. (1985). Assessing the instructional management behavior of principals. *Elementary School Journal, 86*(2), 217–247.

Hattie, J. (2009). *Visible learning: A synthesis of over 800 meta-analyses relating to achievement*. New York, NY: Routledge.

Hattie, J., & Timperley, H. (2007). The power of feedback. *Review of Educational Research, 77*(1), 81–112. doi:10.2307/4624888

Honig, M. I. (2012). District central office Leadership as teaching: How central office administrators support principals' development as instructional leaders. *Educational Administration Quarterly, 48*(4), 733–774. doi:10.1177/0013161X12443258

Hord, S. M., & Hall, G. E. (1987). Three images: What principals do in curriculum implementation. *Curriculum Inquiry, 17*(1), 55–89. doi:10.2307/1179377

Hoy, W. K. (2012). School characteristics that make a difference for the achievement of all students: A 40-year academic odyssey. *Journal of Educational Administration, 50*, 76–97.

Hoy, W. K., & Miskel, C. G. (2013). *Educational administration: Theory, research, and Practice* (9th ed.). New York, NY: McGraw-Hill.

Kluger, A. N., & DeNisi, A. (1996). The effects of feedback interventions on performance: A historical review, a meta-analysis, and a preliminary feedback intervention theory. *Psychological Bulletin, 119*(2), 254–284. doi:10.1037/0033-2909.119.2.254

Leithwood, K., Louis, K. S., Anderson, S., & Wahlstrom, K. (2004). *Review of research: How leadership influences student learning*. Retrieved from www.wallacefoundation.org

Marzano, R. J., Waters, T., & McNulty, B. A. (2005). *School leadership that works: From research to results*. Retrieved from http://www.amazon.com/School-Leadership-ThatWorksebook/dp/B0042JTB1E/ref=tmm_kin_title_0?ie=UTF8&m=AG56TWVU5XWC2

May, H., & Supovitz, J. A. (2011). The scope of principal efforts to improve instruction. *Educational Administration Quarterly, 47*(2), 332–352. doi:10.1177/0013161X10383411

Murphy, J. (1990). Principal instructional leadership. *Advances in Educational Administration, 1*(B: Changing Perspectives on the School), 163–200.

No Child Left Behind (NCLB) Act of 2001, Pub. L. No. 107-110, § 115, Stat. 1425 (2002).

Peterson, K. (2002). The professional development of principals: Innovations and opportunities. *Educational Administration Quarterly, 38*(2), 213.

Robinson, V. M. J., Lloyd, C. A., & Rowe, K. J. (2008). The impact of leadership on student outcomes: An analysis of the differential effects of leadership types. *Educational Administration Quarterly, 44*(5), 635–674.

Sheppard, B. (1996). Exploring the transformational nature of instructional leadership. *Alberta Journal of Educational Research, 42*, 325–344.

Stein, M. K., & Nelson, B. S. (2003). Leadership content knowledge. *Educational Evaluation & Policy Analysis, 25*(4), 423–448.

Stein, M. K., & Spillane, J. P. (2005). What can researchers on educational leadership learn from research on teaching? Building a bridge. In W. A. Firestone & C. Riehl (Eds.), *A new agenda for research in educational leadership*. New York, NY: Teachers College Press.

Supovitz, J., & Buckley, P. (2008, March). *How principals enact instructional leadership*. Paper presented at the annual meeting of American Educational Research Association, New York, NY.

Supovitz, J., Sirinides, P., & May, H. (2009). How principals and peers influence teaching and learning. *Educational Administration Quarterly, 46*(1), 31–56.

Weber, J. R. (1996). Leading the instructional program. In S. P. Smith, (Ed.), *School Leadership* (pp. 253–278). Eugene, OR: Clearinghouse of Educational Management.

CHAPTER 6

HIGH PRIORITY SUPPORT FOR HIGH PRIORITY LEADERSHIP

Principals' Perceptions of a Support Network in an Urban School District

Thomas H. Beatty

ABSTRACT

The role of the school principal is highly complex and dynamic and therefore requires ongoing professional development and learning if the principal hopes to lead effectively and respond to the challenges inherent to school leadership. Networking among principals is frequently identified as a valuable source of professional learning for school leaders. In this qualitative study, the researcher investigated how networking promotes experienced principals' professional growth through an exploration of what principals reported about the nature, characteristics, and benefits of peer dialogue. Participants—identified through purposeful selection—were nine practicing middle school principals from an urban school division in Virginia. Their experience in the job ranged from 3 to 9 years. They indicated that dialogue with role-alike peers is useful to them in their practice. Data were collected through individual interviews.

Leadership and School Quality, pp. 115–134

PRINCIPALS' PERCEPTIONS OF A SUPPORT NETWORK IN AN URBAN SCHOOL DIVISION

My first year as the principal was miserable. There was a daily tsunami of administrative laundry lists—overbearing support staff, pouty teachers, and a school building that should have been condemned by the health department. I thought that my fellow principals would embrace me as a member of the club. What I learned was being principal was like being a baseball manager—it's all about competition. Except in my case, this meant competition for resources that each of us desperately needed. Basically, being a principal is lonely work. My first day as a middle school principal began with a 16-year-old eighth grader whose mother was angry because I wouldn't assign her son a parking space. By lunch, I'd been cursed at by a student and yelled at by a staff member. And by dinner, I'd saved the budget of the after-school program as well as the nest of robins in the cafeteria storeroom.

I later learned that discussing dilemmas and issues of practice with colleagues would help me analyze situations and problems, consider alternative solutions and responses, and make thoughtful leadership choices. This can be difficult when you consider that the colleagues one depends on and confides in may well turn out to be the same colleagues one competes with for district-allocated resources.

The purpose of this chapter is to examine the tricky dynamic of support networks for school leaders in terms of their impact as a source of ongoing professional learning and development. This chapter opens with a brief discussion of the literature relative to principals' networks. Next, a rationale for the study that grounds this chapter is given. The aforementioned study is then unpacked. Finally, this chapter concludes with research findings and recommendations for increasing dialogue structures for school leaders.

PRINCIPAL SUPPORT NETWORKS

Research and practitioner accounts in the field of educational leadership assert the positive benefits of networking as a resource for principals' professional development. While informal networking opportunities such as conversations between school leaders at lunch, receptions or conferences for peers may have benefits for principals, current research has focused on deeper, more deliberative networking processes and their impact on professional growth (Harris, 2008). Although education networks vary in composition, structure, and format, such arrangements are purposefully developed and cultivated as a resource for professional learning. Harris examined purposeful networking structures in education and offered

definitions and explanations of networks applicable and relevant to the work of school leaders.

A network of practice is distinguished from other types of networks in that "the primary reason for the emergence of relationships within a network of practice is that individuals interact through social discourse in order to perform their work, asking for and sharing knowledge with each other" (Harris, 2008, p. 220). According to Harris, however, additional information is needed about the nature, process, and impact of networks as a means of understanding their sustainability and utility within the educational system. Examples from the literature (Louis & Kruse, 1995; Martel, 1993), however, provide some insights into the ways in which principal peers collaborate to engage in professional learning and the benefits derived from this practice. Each case is an example of school leaders' purposeful engagement with each other to explore and improve their work together; therefore, they meet Harris's (2008) definition of networks of practice.

The Principal Professional Learning Communities are one example. Principals gathered monthly for structured meetings as a professional development offering facilitated through a principals' center. Modeled after teacher centers, the primary purpose of the principals' center would be to stimulate professional growth and effective administrative practices (Barth, 1981). Piggot-Irvine (2004) stated that the meetings were structured to follow a predictable format. At the beginning of each meeting, principals spent time reconnecting and sharing news, celebrations and ideas from their schools. Afterwards, principals engaged in guided reflection focused upon the discussion of pre-read articles and the application of the reading's ideas and information to their settings (Piggot-Irvine, 2004).

Smith (2007) discusses a peer support program in which principal peers gathered throughout the year to share ideas, discuss issues and develop tentative remedies, and set and monitor their own personal and professional goals. Smith served as the facilitator. In this case, the peer-mentoring program was developed through the initiation of principal members, who sought outside facilitation to organize and guide the group. Outside facilitation was desired to attend to meeting logistics as well as manage the process, assuring that all participants were able to contribute and that meetings stayed on topic. Smith further states that while group members indicated that they controlled the processes and content of their meetings, they relied upon an outside facilitator to organize and manage the peer mentoring experience (Smith, 2007).

There are many principal support groups that utilize external facilitators to guide and support their work. Moreover, there are groups that create and facilitate their own networks to further their learning. Within the context of their of bringing principals together to discuss challenges and share strategies and ideas, Sterrett and Hass (2009) established norms for

their meetings such as invoking a no venting rule and remaining focused on solutions so that their time together with their principal colleagues could be productive.

Reflective Practice and Professional Learning

Principal reflection is essential for professional growth as it provides a self-dialogue that prompts principals to examine their beliefs, challenge their assumptions, and consider new ideas (Brill, 2010; Donaldson, 2008; Drago-Severson, 2009; Robertson, 2009). Effective professional development for school principals provides opportunities for principals to be exposed to new ideas and ways of thinking and promotes self-reflection to transfer new learning into practice (Educational Research Service [ERS], 1999). The goal for reflective inquiry is for principals to "reflect on their values and beliefs about their roles as school leaders, take risks and explore new skills and concepts, and apply their knowledge and skills in real school contexts" (Fenwick & Pierce, 2002, p. 3).

The processes and value of reflective inquiry are noted in the work of Schön (1983), who discusses the importance of professionals' ability to think about their practice while they are engaged in it and maintains that such "reflection in action" (p. 280) is necessary to expand one's repertoire of skills and knowledge to respond to unique situations. The combination of both "reflection in action" (p. 280) coupled with "reflection on action" (p. 26) (reflection upon events and decisions after the fact) are an experimental process through which professionals essentially act as researchers of their own practice (Schön, 1983).

Rooney (2006) explains that principals' craft knowledge, or extraordinary insights about their practice, is built through opportunities for reflection sparked by questions such as "What do we hope for our kids?" or "How can we get parents involved without having them 'take over?'" (p. 90). Discussions and observations between principal peers have led them to each develop new practices, refine existing practices, and adapt approaches and ideas to best fit their school contexts (Sterrett & Haas, 2009).

Understanding how principal peer dialogue and reflection influences school leaders' practice and helps them grow professionally requires, at least in part, a deeper exploration of the focus and processes of these interactions. Given the complexity of the role, school principals must continuously develop their skills and capacity in a variety of different areas. Leading schools effectively requires principals to develop, manage, and oversee day-to-day operations and procedures. Additionally, principals must facilitate processes to build relationships among and between staff, students, families, and the greater community, establish vision, and guide the organization toward constant improvement. In the face of the myriad

and varied challenges of the principalship, school leaders must develop and continuously broaden their repertoire of skills and knowledge. They must be able to apply a variety of strategies and solutions and tailor processes and approaches to navigate both routine problems as well as more complex challenges of practice (Blase & Blase, 2000).

Supporting principals' ongoing professional development requires further investigation into the ways in which school leaders make contacts to build their capacity to lead effectively. Additional research exploring the nature, characteristics, and impact of peer dialogue can help us better understand how principals may be supported to develop new skills and knowledge throughout their careers.

RATIONALE

Researchers have investigated ways to support aspiring and fledging principals. However, there is a paucity of research on how experienced principals continue to develop their leadership skills and knowledge. The research that does exist suggests that networks that bring principals together are a valuable resource for principal learning (Bengtson, Airola, Peer, & Davis, 2012; Buck, Arterbury, & Crawford, 2007; Byrne-Jimenez & Orr, 2007; Swaffield, 2004). Although current literature presents a variety of principal interactions as examples of networking (Bengtson et al., 2012; Drago-Severson, 2012b), additional informational about the characteristics and influence of those networking relationships principals find most useful to them in practice is very much needed.

Arguably, leadership in high poverty schools with low academic performance is one of the most demanding challenges in the field of educational leadership. Disrupting hegemonic structures and protecting the civil rights of all in a community is the heart of day to day leadership in schools. In this chapter, the researcher focuses upon peer dialogue between school principals as a mechanism to strengthen efforts and opportunities for *all* children in school. Promoting high achievement for students requires that researchers critically examine patterns of interaction and communication among school leaders to determine the reasons why students in some schools are privileged and others are marginalized (Apple, 2001).

UNPACKING THE STUDY

Method

This study has been designed as a qualitative inquiry into the nature, characteristics, and benefits of peer dialogue for school principals. Specifically, this study will employ a phenomenological approach that informs

both the design of the study and data analysis procedures. In this case, the phenomenon of principal-peer dialogue will be investigated to develop a description that captures participants' shared experiences to help understand how these relationships develop and function to support principals' continued growth.

An interview protocol was utilized to guide the data collection process for the interview sessions and follow up sessions. Data analysis was conducted in stages consistent with phenomenological research methods. Participants were interviewed and audio tape recordings were made and transcribed. The transcripts of the tapes were first reviewed to identify and code statements that illustrated participants' experiences of dialogue with role-alike peers and the contexts and conditions that support such exchanges. These statements were grouped to identify themes in the data. This served as the basis from which textural and structural descriptions were composed to describe the commonalities of the principal-peer dialogue experience, as well as the conditions and factors that support these experiences. Descriptions were constructed with reference to concepts from the literature to enhance the researcher's understanding of the nature, characteristics, and effectiveness of principal peer dialogue.

Participants

Participants were nine middle school principals (pseudonyms were used) from an urban school division in Virginia who participated in leadership training, the Partnering for Excellence Program (PEP). This program has an emphasis on best practices for good leadership to produce high achieving results in schools. In this program, seminars were led by a consultant who works with businesses and educational institutions on aligning culture and leadership practices to create high performing organizations. These seminars addressed topics such as strategic leadership, operational excellence, talent management, leading change, and organizational renewal. Initially, the principals were administered the Leadership Competency Inventory (LCI), the Meyers Briggs and the Leadership 360 Assessment. A comprehensive profile was developed for each principal indicating their areas of strength and opportunities for growth. The leadership profiles provided a framework for goal setting and for discussing insights during the seven seminars that were held throughout the school year. The seminars were forums for principals to discuss their profiles, goals, successes and leadership challenges.

Participants were interviewed in an effort to collect their insights on their experiences in PEP and to determine if PEP led to further network support either formally or informally. Data were collected in nine interview

sessions. Artifacts such as e-mails and work products were sought from participants as yet another form of data and evidence of participants' interactions with role-alike peers.

The participants were interviewed in April 2014. The researcher collected and analyzed principals' accounts of their dialogue and consultation with role-alike peers to help examine how these relationships function to support their continued professional growth. The term *professional growth* is used to refer to those experiences reported by principals to promote the development of the skills, knowledge, and attitudes that strengthen their competence and confidence to lead effectively in their school settings. The phrase *principals' most valued, influential, or beneficial interactions with peers* refers to those experiences participants report as most helpful in fostering their ongoing learning.

FINDINGS

There were four major themes identified from participants' responses: The first two were *rewards of the principalship* and *challenges of the principalship*. The third theme, *trust*, was identified by participants as one of the major benefits of being part of a support network. The fourth theme was *support* itself. What follows is a discussion of the four themes.

Theme One: Rewards of the Principalship

In terms of rewards, the themes were relationships with students, families, and teachers; problem-solving and planning; and leading improvements that make a difference in leadership inventory.

All of the participants in this study articulated their commitment to and enjoyment of the role, and cited specific aspects of their work that particularly excited them. As Jean James commented, "We have fascinating jobs. The principalship, sometimes it's definitely hard … but it's exciting. We can really be change agents on a wide scale for a lot of kids" (personal communication, April 9, 2014). The majority of participants in this study reported that they find working and developing relationships with students, teachers, and families to be the most rewarding aspect of their work. Another common aspect of the job all of the participants reported as energizing and fulfilling was problem solving and planning. This includes the opportunity to lead changes and improvements that make a difference in their settings. Most participants also expressed an appreciation for the varied nature of their jobs, explaining that they enjoy the wide variety of tasks that require

their attention. All of the participants in this study maintained that their effectiveness depended on continual efforts to learn and develop their practice and expressed commitment to their ongoing professional growth. They described their desire to learn with and from others who are engaged in the same work and articulated the importance of the principal being a model of ongoing learning and growth. John Ralph's comments typify this sentiment: "I want to continue to learn and develop. I think the saying goes, 'The day you're done learning is the day you're done'" (personal communication, April 8, 2014).

Theme Two: Challenges of the Principalship

Under challenges, the themes were isolation, volume of work and competing priorities. Although they enjoy their role as principals, participants also described the demands and challenges of the job in ways consistent with existing accounts in the literature. The majority of participants said the job can be "isolating" and that school leaders often feel "alone" or like "an island." John Ralf's comment captured what was frequently expressed by participants in this study, "There are teachers in every building, but there's just one principal … so it's just inherently an isolating job" (personal communication, April 8, 2014). Earl Sumpter's comment echoes this sentiment:

> What we do can be very isolating. In a building, as an administrator, you don't have a cohort that you interact with every day on a regular basis. As a teacher, you can very easily go into the next room and maybe talk to somebody about something. As a principal, you don't have that…. You really are an island to some degree. (personal communication, April 8, 2014)

Participants conveyed the importance of maintaining professional boundaries with their staffs that limit them from openly talking about or sharing their questions, concerns, and frustrations. As Debbie Lawson noted, "Within your building it's very isolating because you could be very friendly with everybody, but you can't be friends with anybody" (personal communication, April 9, 2014).

> According to the participants interviewed for this study, the volume and pace of school principals' work is often daunting and presents challenges. They report constantly needing to constantly navigate multiple petitions for their time and attention and to be an available and accessible presence within their schools. Participants' accounts render a vivid sense of the principalship as a role characterized by numerous and frequent demands, a weighty workload, and competing priorities.

> We're always that go-to person in the building. You walk in and you have to be ready. You have to be ready for 400 kids. You have to be ready for 50 … staff members. Those parents that walk in--they expect you to just be there. Sometimes it's hard to just be there…. Everybody looks to you for an answer …"You got a minute?" "No, really I'm supposed to be [elsewhere], but okay, what do you need?" You learn to say, "I don't have a minute, but I have thirty seconds. What can I do for you?" When I get home, I ask myself, "What happened today?" because it's pretty intense at times. (J. Lang, personal communication, April 9, 2014)

> The greatest challenge I have is time. You could work 24 hours a day, seven days a week and still feel like you are behind. As it is right now, I think there are so many demands that require the principal to be responsive to the needs of families, responsive to the needs of the kids, responsive to the needs of the adults, the teachers in the building, and then also responding to what the school system needs relative to central office…. It's a really hard, time-consuming job (Earl Sumpter, personal communication, April 8, 2014).

The challenges of the job can exacerbate principals' feelings of isolation as their time and attention are consumed managing and responding to the constant appeals. Under such conditions, reaching out to and connecting with other principals is often difficult. In this study participants report that these conditions reduce their interactions with peers and, therefore, restrict their access to what can be a valuable resource for their own continued growth and development as leaders. Isolation from other school leaders impedes opportunities for principals to become better equipped to respond to the many challenges of their school settings, challenges that underlie and intensify their isolation in the first place.

Theme Three: Trust

When participants in this study were asked to describe their most valuable and influential experiences having dialogue with role-alike peers, participants consistently shared relationships characterized by high levels of trust and respect. All nine participants interviewed emphasized the importance of trust as a foundational condition that enabled them to feel comfortable communicating honestly with principal peers. Participants indicated that their most beneficial relationships with other principals were those in which they were able to talk openly about their practice with the knowledge that their confidences would be kept by others with similar experiences and needs for discretion. Judy Jamison explained that the high degree of trust between principals creates an environment in which peers felt "comfortable to share" (personal communications, April 8, 2014). She

stated that the environment made it possible to both easily ask for and solicit ideas and assistance from one another. The importance of trust is further illustrated in the following comments from Jean James:

> I think there's also the trust factor, because we all know each other. If you're behind closed doors and you say, "Oh my God, I have to tell you something that's been driving me crazy," you know it's not going to go any further than that.… In my previous district, I think that might have been a drawback, because I think I wouldn't have said things quite so openly as I do with my current group. I think it's in knowing, in year seven here, anything that I've said in confidence has remained in confidence. In my previous district, sometimes things that were said in confidence would come back through a different avenue and that trust is broken and you're not going to say what you want, need to say, any more. (personal communications, April 9, 2014)

Judy's and Jean's statements articulate what was emphasized through the accounts of all participants in this study. Trust between principals creates the conditions under which they feel comfortable to speak openly, disagree, and give and receive constructive feedback. Further, participants report feeling more comfortable taking risks that expose their vulnerabilities and weaknesses in the context of trusting relationships. As leaders of their schools, several participants in this study reported that they were often called upon to address questions and problems, and sometimes feel that they were expected to have all the answers.

The importance of trust to principal peer relationships was articulated both by principals' accounts that demonstrated the ways in which high trust enhanced their interactions and by those stories that detailed the detrimental effects of lack of trust. As Tim Little remarked, "Someone's not going to ask a question and show their inexperience or that they're vulnerable with a group that they don't trust" (personal communication, April 9, 2014). The effects are illustrated by the account of John Lange, who reported that lack of trust among administrative colleagues caused him to limit his interactions with them. "I didn't feel like we trusted each other a lot. [I feel like] 'Ugh. Gosh, just keep your distance because they are not going to be helpful" (personal communications, April 9, 2014). Jean James' example further interrupts the critical importance of trust.

> It was competitive, and you would say things thinking that you were sharing with people who were sharing honestly with you, and then suddenly it would come back up in front of the superintendent in a way that you could tell was meant to kind of undercut you.… That wasn't a good situation at all, which was why I left after four years. Because it was … it didn't help … there was nothing about that experience that made me feel like anybody cared about my own professional growth. (personal communications, April 9, 2014)

While trust emerges as the most frequently cited factor common to all participants in this study, it is important to note that relationships that support the participants' professional growth are born of interactive processes that allow school leaders to develop meaningful bonds. Examples from this study highlight additional key conditions that help to support the development of trust and heighten the benefit principals experience within their exchanges with peers. First, participants reported that reciprocal exchanges of support helped to develop and sustain trust within their relationships with other school leaders. Second, participants indicated that relationships of trust were developed and reinforced with role-alike peers who demonstrated leadership practice and skills they respected. Finally, participants reported that they more readily cultivated enduring relationships with others who shared similar philosophies, backgrounds, and experiences. Participants' accounts help us to understand the ways in which these factors contribute to the development of trust necessary to support their professional learning. Exchanges between school leader peers support the development of trust, reciprocity, respect, and a sense of commonality in mutually reinforcing ways. Principals' ongoing interactions create a cycle in which their dialogue strengthens and reinforces the conditions conducive to supporting their growth within their peer networks.

According to the participants in this study, they most value those interactions with peers that are characterized by a mutual desire to improve one's practice and "give and take" wherein they are both receivers and providers of support to others. "I believe I do best in any relationship where both people are benefiting from it.… [I want to] feel like I am actually helping them, too" (personal communications, April 8, 2014) explained Paul Whayman. The absence of reciprocity increases principals' discomfort and impedes trust development within their interactions with other school leaders. Tim Little attributed the high level of trust and safety he experienced within a principal support group to the reciprocal exchanges that characterized their interactions. According to Paul,

> All members of the group were willing to disclose that we were struggling with something. That everything wasn't going great, because I think any principal who tells you, "Everything is going great," is lying. It's too complicated a job and so someone like that that would say everything is going great probably wouldn't be a great [support group] contributor or member because they would not make it as safe a space. They would potentially be intimidating to the rest of the group who are putting ourselves out there and saying, "I really don't know how to move forward with this or that," and that's not an easy thing to be able to … we are all leaders and leaders are supposed to be competent, and know our stuff, and the reality is we don't know everything, and it was important that we are willing to identify some area of our work that we needed some help with. (personal communications, April 8, 2014)

Paul's example articulates a common theme found in participants' accounts. Participants find it highly rewarding and helpful to engage in open, honest dialogue and reveal their questions, problems, and mistakes with other principals. Doing so requires a high degree of trust, however, which is enhanced through reciprocal sharing between school leaders. Participants' positive assessments of school leader peers' competence and skill was another important condition noted by participants in their accounts of helpful peer dialogue. Debbie Lawson described watching how other principals in PEP handled situations and the ways in which her assessment of their judgment in those circumstances impacted the likelihood that she would reach out to them for support. Similarly, Judy Jamison commented,

> I think there has to be some respect and value [that] this person is competent at what they're doing, so that if I seek advice or talk with them, I'm going to go back having learned something new that I could potentially use. (personal communication, April 8, 2014)

That principals learn more from and with school leaders whose practice they admire and respect is not surprising. Eight participants in this study indicated that their most valuable interactions occurred with "like-minded" principals or individuals who shared similar philosophies or "mindsets." An explanation from Debbie Lawson helps illustrate this point:

> If you're getting information about something from someone who doesn't share the same sort of philosophical base well then, you're not going to value that information as much. I think with those two categories, that level of feeling like you're both on the same page and you're coming from the same place and you can trust that person, that's critical. If you're going to get someone's advice, if you're going to troubleshoot, you have to have a similar ethical and moral core that you're working from, or a set of values and principles. Then you feel very confident with that other person, because you feel like we both are coming from the same place, we want the same things. (personal communication, April 9, 2014)

Theme Four: Support

Participants expressed a desire to learn with and from others similar to them. Participants found it useful to connect with school leaders who espouse similar philosophies and share a common appreciation for collaboration and joint learning. In addition to professional commonalities, personal similarities between peers may also enhance trust and relationship building between principals. For example, one participant explained that her relationship and sense of understanding with a principal peer was enhanced by the fact that in addition to both being principals in the

same district, they were the same age and have children approximately the same age.

> It's nice to be able to talk with someone else who is experiencing the same issues at work that you are. What's even nicer is when you find that they experience many of the same personal situations you do, such as dealing with children and home and other family issues. You feel better because the person is able to listen to you and empathize, even if the person can't give you an immediate solution to a problem. (personal communications, Jean James, April 8, 2014)

Participants in this study indicated that they appreciated the ease of communication with other school leaders. Jean James explained that a benefit of her dialogue with peers is that "Mainly we get to speak in shorthand … I don't have to spend a lot of time explaining myself" (personal communications, April 9, 2014). Shared values, beliefs, and/or backgrounds between network members may strengthen principals' bonds with role-alike peers. However, according to some participants, this similarity may also limit principals' exposure to different perspectives and opportunities for school leaders to challenge each other's thinking. Debbie Lawson explained this perspective when she commented,

> Because so many things are similar from school to school, it helps a lot because we're all on the same page around many different initiatives. The unfortunate part, perhaps, is that there's no diversity among us, and so there isn't a dissenting voice. Overall, we're on the same page a lot. (personal communications, April 9, 2014)

Debbie explained that she felt that group members had developed relationships that would allow them to challenge one another or to disagree comfortably, but that because of their similarities, the group had not ever experienced that. She said,

> It's not that we wouldn't challenge each other. What I meant to say was that it doesn't seem to happen very often because we seem so aligned in our work. I believe that if we brought up an idea, I believe we would challenge each other in a minute. I don't think anybody … we have a good, solid relationship, so I think that we would all feel very comfortable challenging [each other] …However, I can't think of a time that it has happened. (personal communications, April 9, 2014)

Putting it All Together: Principals' Interactions With Other Principals

Participants were asked to share the ways in which they interacted with other school leaders. The researcher wanted to gain an understanding

of the opportunities available to principals and to further investigate the characteristics of those exchanges participants reported were most useful to them in their practice. Data from this study suggested that principals exercised differing degrees of control over the focus, content, and processes of their dialogue with role-alike peers. In some cases, the content and processes were determined by entities or organizations other than the principal participants themselves. Here, these circumstances are referred to as being externally controlled. By contrast, other arrangements rely upon principals themselves to control the content and processes. These circumstances are referred to here as internally controlled. Additionally, principals' opportunities to interact with other school leaders vary in the extent to which their participation is voluntary or expected.

Despite the isolating nature of their work, school leaders in this study all reported that there were occasions during which they interact with other principals. While participants' opportunities for interaction with role-alike peers differed, they all reported having contact with principals within their district through regular principals' meetings and district-organized initiatives that brought administrators together for common tasks and purposes. According to the participants, the superintendent held regular meetings with district principals and in some cases, other central office administrators, to discuss and conduct the ongoing work of the district. In addition, some participants indicated that they regularly meet with district peers to focus on a specific area of practice. Participation in such interactions was expected and required. Participants reported having little input into the agendas around which such interactions were structured, but the processes were largely steered by the superintendent.

In addition to required principals' meetings, participants described regular meetings called by principals themselves. These meetings were described as opportunities for principals to communicate with and support one another around matters of practice. In these instances, principals organized and managed the content and processes of their dialogue and their interactions varied with respect to frequency, formality, and structure.

Four of the nine participants interviewed for this study reported participating in organized, ongoing principals' meetings with school leaders outside their district. Such groups, while varied in format and structure, were described as places where principals gathered to discuss issues of leadership, assisted one another to think about dilemmas and problems of practice, and to provide social support and professional community for group members.

Participants also report interacting with other school leaders through various committees and professional learning contexts. Several participants reported serving on professional organization committees with other school principals. Others reported attending conferences that provided

opportunities for exchanges with other school leaders. Participation in professional committees and conferences was described as a voluntary activity chosen by principals themselves, but the sponsoring agency or school provided the agenda and focus of such interactions. Finally, participants in this study reported having dialogue with other principals in a host of informal ways. As a result of having formed relationships with principals through district work, group membership, and conferences, school leaders reach out to role-alike peers in less formal ways to seek advice and feedback, share concerns, ask questions, vent frustrations, and discuss matters of practice. Participants shared examples that illustrated a range of less formal interactions between principal peers. One example included principal colleagues calling one another to debrief about their day. Getting together on a Friday afternoon to vent about a frustrating situation or difficult week was an example shared by another participant in this study and in all cases, these interactions are completely initiated by the principals themselves.

Existing research categorizes a broad range of principal interactions as forms of networking and maintains that such relationships are valuable sources of support that help principals to build their craft knowledge and reduce isolation (Chapman, 2006; Fenwick & Pierce, 2002; Sterrett & Haas, 2009). Yet participants in this study were clear that despite having opportunities to interact with other school leaders in a variety of different ways, they valued and appreciated those exchanges that contribute to their ongoing professional growth most. Participants' most influential and beneficial interactions were described as those in which they experienced increases or improvements in their capacity to lead effectively and cope with the challenges of their roles.

Further inquiry into participants' experiences suggests that the type of interaction and the degree of control they have over the content and processes (e.g., principals' meeting, principals' group) is not predictive of the value and benefit principals derive from the exchanges within those forums. Consider these examples of planned interactions controlled by district or professional development leaders. Although all participants in this study reported interacting with other principals in district-based administrator meetings, some found them immensely rewarding and fruitful experiences while others lamented them as ineffective and non-productive means of furthering their continued development as school leaders. In another instance, one participant referred to her interactions with principals at the annual state principals' association conference as a "rejuvenating and refreshing" learning opportunity while Judy Jamison described them as "sort of an 'old boys' network' type of experience and not a professionally enriching, growing, learning experience" (personal communication, April 8, 2014). The accounts of participants in this study help us to understand

that although they have the opportunity to network with role-alike peers in a variety of different ways, they regard some experiences as far more helpful in promoting their learning than others. Their accounts demonstrate that relational characteristics and professional regard are the critical factors that distinguish and elevate the value and benefit of some interactions between principals above others. These factors are discussed here below.

Principal Networks and Professional Learning

School leaders in this study were asked to share what they believe to be instances when their dialogue with role-alike peers was helpful to them in their practice. Their examples provide insights into the ways in which principals perceive they benefit through these interactions. Based on the findings it is possible to identify three domains under which participants reported changes in knowledge, skills, attitudes, or capacity as a result of their dialogue with peers.

Leadership skill development. In some cases, principals' interactions with peers help them to expand their repertoire of ideas, strategies, information, and resources to do their jobs. Such interactions help facilitate what principals know and provide them with an increased selection of resources to apply within their school settings. Following is an example that helps illustrate interactions that facilitate leadership development.

As principal of a middle school, Jean James was frustrated by students' repeated violations of the school's technology acceptable use policy and the time and effort she and her assistant principal were putting in to responding to such issues. She asked a trusted middle school principal colleague how he was managing student technology infractions. His answer provided her with a different model that she had not thought to try, and implementing similar procedures in her school had a very positive impact. The largest infraction was student cell phone use during class. The colleague explained that he had teachers collect cell phones at the beginning of class and they were returned to students at the end of class. If a student did not turn in a cell phone but was caught using it, the phone was confiscated by the teacher and would only be returned to the parent. In this case, a strategy from a colleague expanded Jean's view of the options she had available to her to address a situation in her school (personal communications, April 9, 2014).

Leadership judgment. Though principals in this study indicated that they routinely engage in information and advice seeking with colleagues, they were clear that they were not simply looking for people to tell them what to do or how to do their jobs. Rather, as principals seek to expand what they know about leadership, they also indicated the ways

in which their roles required that they carefully consider their contexts, review options, and make judgments about how best to lead. In addition to helping principals expand their leadership inventory, interactions with peers help principals to develop and hone their leadership judgment. Participants' accounts help us to understand that some interactions help principals to develop their ability to analyze and interpret situations and respond flexibly to specific contexts and circumstances.

As discussed earlier, participants spoke frequently of turning to peers to "bounce ideas," and "test my thinking." They reported asking peers to "push my thinking," "give me feedback," or to be "the devil's advocate." This helped them to consider issues and dilemmas of practice from multiple perspectives and that experience helped them develop their leadership acumen. According to participants in this study, their interactions with peers were worthwhile in part because they helped them to build their capacity to make effective leadership decisions within their school contexts.

Leadership integrity. "Educators have, at their core, a set of values and beliefs that guide their practice and leadership" (Drago-Severson, 2012a, p. 6). This idea is supported by principals when they stated that talking with their colleagues helped them understand, question, and sometimes examine their own beliefs and their perspectives about leadership. Further, their interactions with colleagues can often challenge principals to examine the alignment of their beliefs and their practice. Their accounts help us to understand that principal peer dialogue is helpful to school leaders in part because it helps them to learn more about their identities as leaders and strengthen their leadership integrity.

Principals' values and beliefs are inextricably linked to their ability to make leadership judgments and apply tools from their leadership inventory to address role- and context-based issues and problems. Principals were aware of and attentive to the ways in which their core values influenced their ways of viewing and responding to matters of practice. This impacted directly the extent to which they were able to lead in a conscious and purposeful manner. Dale Lander described this: when a staff member made a hostile and rude remark loudly and publicly in a staff meeting, Dale said she was initially so shocked she did not know how to respond. Later, she considered past conversations with a colleague about the direct ways in which he confronted issues of adults' unprofessional behavior in his school. Despite her discomfort, Dale approached the teacher immediately after the meeting to address the issue with her, acknowledging that in the past, she was far less likely to address issues of an adult's behavior or when she addressed it, she did so in an indirect way such as sending an e-mail to the employee. This is a clear illustration of how dialoguing with a peer helped Dale close the divide between her beliefs and her actions. She credited dialogue with her colleague and his example with helping her to address

issues concerning adults' inappropriate behavior in a more immediate and forthright manner. Dale commented,

> I knew I should be doing this anyway. I know we address children's behaviors all the time, but … it's difficult for staff to address other adults. But if I expect my staff to do it, then I have to model that for them … the number of conversations that I've had with [my colleague] about staff have really changed my practice, but it's not anything I didn't know. It just really has pushed me to say, "This is the right thing to do. This is what I need to be doing if I am going to be in this role. I have to address adults, even though it may be uncomfortable." (personal communication, April 8, 2014)

In Dale's case, dialogue with a peer prompted her to acknowledge the ways in which her own discomfort prevented her from acting in congruence with her beliefs about the right thing to do. Her colleague's example, coupled with her new insights into her own behavior, prompted her to make changes in her leadership practice to align her beliefs and behavior. Similarly, Debbie Lawson (personal communication, April 9, 2014) described the ways in which her interactions with role-alike peers have helped her to define, clarify, and articulate her values and beliefs about education and school leadership and align her leadership accordingly.

Dale and Debbie expressed what many principals in this study reported: interacting with principals helped them to analyze their practice and learn more about themselves as leaders. Their dialogue with peers helped school leaders connect with and learn from each other. Not only around their shared experiences as leaders, but they helped revisit, strengthen, and revise the values, beliefs, and motivations that drive their continued investment in a difficult and challenging role.

What follows next are recommendations as they relate to the relevancy or practicality of such programs.

Recommendations

Serving schools in the role of principal is indeed a glorious tumble in a tsunami. But inside all the chaos is a myriad of opportunities as demonstrated by those who shared their perspectives on collegial networks and reflective thinking. Principals' accounts in this study reinforce findings of other research that indicates principals often find the principalship to be an isolating and lonely role (Chapman, 2006; Nicholson, Harris-John, & Schimmel, 2005). Further, principals in this study report that the volume and pace of principals' work within their schools consume their time and limit their opportunities to connect with other administrators. In this chapter, the researcher points out that principals derive a variety

of benefits from their participation in peer support networks. Participant accounts suggest that although networks are an important source of support that helps them in their practice, networks do not necessarily spark deep, transformative learning nor operate necessarily as mechanisms for improving their capacity to respond to adaptive challenges in their schools. Additional research is recommended to further explore peer dialogue processes, principals' learning, and the factors that enhance or impede the development of school leaders' adaptive capacity through participation in peer learning networks. Additionally, exploration of principals' learning through dialogue with nonpeer educators such as superintendents, curriculum directors, teachers, and professors is also recommended. In the meantime, this study and existing literature suggest that providing principals with time and space to practice reflection with others explicitly and engage with alternative views and perspectives may help them to deepen their learning. Superintendents are well situated to provide the kind of guidance and support principals need to continuously develop their skills, knowledge, and attitudes to effectively lead.

Examining principals' dialogue and interaction with peers may yield important insights into how school leaders develop their awareness of and responsiveness to difficult issues. Ensuring all schools have strong principals equipped to capably lead and respond to the myriad challenges of the role necessitates a continuing focus for school leaders' ongoing needs for support throughout their careers.

REFERENCES

Apple, M. W. (2001). *Educating the "Right" way: markets, standards, God, and inequality.* New York, NY: Routledge Falmer.

Barth, R. S. (1981). *Journal of Staff Development*, *2*(1). 53–69.

Bengtson, E., Airola, D., Peer, D., & Davis, D. (2012). Using reflective practice and peer learning support networks: The Arkansas Leadership Academy Master Principal Program. *International Journal of Educational Leadership Preparation*, *7*(3).

Blase, J. & Blase, J. (2000). Effective instructional leadership: Teachers' perspectives on how principals promote teaching and learning in schools. *Journal of Educational Administration*, *38*(2). 130–141.

Brill, F. (2010). Reflective storytelling as professional development. *Educational Leadership,* 40(2). 18-21.

Buck, J., Arterbury, E., & Crawford, C. (2007). Professional growth: Elements and characteristics valued by experienced principals. *National Forum of Educational Administration and Supervision Journal, 25*(4), 1–10.

Byrne-Jimenez, M., & Orr, M. T. (2007). *Developing effective principals through collaborative inquiry*. New York, NY: Teachers College Press.

Chapman, J. (2006). *Recruitment, retention, and development of school principals.* Paris, France and Brussels, Belgium: The International Institute for Educational Planning and the International Academy of Education.

Donaldson, G. A. (2008). *How leaders learn: Cultivating capacities for school improvement*. New York, NY: Teachers College Press.

Drago-Severson, E. (2009). *Leading adult learning: Supporting adult development in our schools*. Thousand Oaks, CA: Corwin Press.

Drago-Severson, E. (2012a). *Helping educators grow: Practices and strategies for leadership development*. Cambridge, MA: Harvard Education Press.

Drago-Severson, E. (2012b). The need for principal renewal: The promise of sustaining principals through principal-to-principal reflective practice. *Teachers College Record, 114*(12), 1–56.

Educational Research Service. (1999). *Professional development for principals. Informed Educator Series*. Arlington, VA.

Fenwick, L. T., & Pierce, M. C. (2002). *Professional development of principals*. Washington, DC: ERIC Clearinghouse on Teaching and Teacher Education. Retrieved from http://www.ericdigests.org/2004-1/principals.htm

Harris, A. (2008). Leading innovation and change: Knowledge creation by schools for schools. *European Journal of Education, 43*(2), 219–228.

Louis, K. S., & Kruse, S. D. (1995). *Professionalism and community: Perspectives on reforming urban schools*. Thousand Oaks, CA: Corwin Press.

Martel, L. D. (1993). Building a learning community: School leaders and their organizations need to share a vision to challenge all young minds. *School Administrator*, 50(6), 22–27.

Nicholson, B., Harris-John, M., & Schimmel, C. J. (2005). *Professional development for principals in the accountability era.* Charleston, WV: Appalachia Educational Laboratory at Edvantia.

Piggott-Irvine, E. (2004). Growth, development and a way out of principalship's isolation. *Management in Education, 18*(1). 24–29.

Robertson, J. (2009). Coaching leadership through partnership. *School Leadership and Management, 29*(1), 39–49.

Rooney, J. (2006). Finding time to talk. *Educational Leadership, 64*(3), 90–91.

Schön, D. (1983). *The reflective practitioner: How professionals think in action.* New York, NY: Basic Books.

Smith, A.A. (2007). Mentoring for experienced school principals: Professional learning in a safe place. *Mentoring and Tutoring: Partnership in Learning, 15*(3), 277–291.

Sterrett, W. L., & Haas, M. (2009). The power of two: Two principals find their best ideas for improving instruction come from committing to talk together once a month. *Educational Leadership, 67*(2), 78–80.

Swaffield, S. (2004). Critical friends: Supporting leadership, improving learning. *Improving Schools, 7*(3), 267–278.

CHAPTER 7

PRINCIPAL SUPPORT OF TEACHERS AND ITS IMPACT ON STUDENT ACHIEVEMENT

Mary Lynne Derrington and David J. Lomascolo

ABSTRACT

This study contributes to the literature on principal support as measured by the Principal Support Scale. It explored the relationship between teachers' perceptions of principal support—as measured by the Principal Support Scale (PSS)—and student achievement in reading and math—as indicated by the Adjusted Growth Index (AGI)—in a sample of elementary, middle, and high schools. This study assessed teacher perception of principal support in fourteen K–12 schools as part of a larger study. The PSS was administered in faculty meetings, and participation was voluntary. The PSS is a sixteen-item survey that provides a valid and reliable measure of perceived principal support for teachers (DiPaola, 2012). Data analyses revealed two strong factors of support, *instrumental* and *expressive*, which are consistent with the previous study (DiPaola, 2012). However, analyses failed to reveal the two distinct dimensions of the instrumental and expressive factors found in previous studies. Data showed a significant positive relationship between principal support and mathematics achievement in this sample. Previous

Leadership and School Quality, pp. 135–145

research on the positive relationship between principal support of teachers and student achievement (Andrews & Soder, 1987; DiPaola, 2012; O'Donnell & Whyte, 2005) was conducted only at high schools. This study extends the previous research into K–8 schools and examines the relationship between the support principals provide to teachers and achievement of students in reading and math.

A STUDY OF PRINCIPAL SUPPORT AND STUDENT ACHIEVEMENT

Effective school leaders support actions that improve instruction and result in increased student achievement (Akert & Martin, 2012; Dinham, 2007; Leithwood, Seashore Louis, Anderson, & Wahlstrom, 2004). A review of research on principal leadership and student achievement revealed that leadership is second only to classroom instruction in its contribution to student learning (Leithwood et al., 2004). Although numerous principal leadership actions might be connected to instructional improvement, chief among them is support of teachers, which has been shown to have a significant influence on teachers' instruction in the classroom (Lunenburg, 2013; Lynch, 2012; Nidus & Sadder, 2011; Protheroe, 2011). Principals influence the work and learning environment of teachers through support for instruction, making that support one of the most important elements of instructional leadership (DiPaola, 2012; Harris, 2005).

Principal Support and Teacher Performance

Researchers have correlated principal support with such variables as teacher commitment and burnout, school culture and climate, and student achievement (Littrell, Billingsley, & Cross, 1994). Teachers identify principal support as critical to their success (Andrews & Soder, 1987; Leithwood et al., 2004; O'Donnell & White, 2005). Principal support also contributes to the retention of talented teachers, since teachers report leaving the profession due to a *lack* of principal support (Ingersoll & Smith, 2004). Even in a demanding subject such as mathematics, teachers are more likely to persist through difficulty and remain in their positions when they feel supported in their work (von Frank, 2008). They are also more likely to work beyond their explicit contractual duties to help improve the school and help students be successful (Akert & Martin, 2012). Conversely, when principal support is not perceived, teachers exhibit more stress, more absenteeism, and less motivation (Singh & Billingsley, 2001).

Previous researchers have focused on the type of leadership style or skills that indicate principal support. For instance, Andrews and Soder (1987)

examined principal support and its correlation with student achievement, identifying four areas of principal support: resource provision, instructional support, communication, and visible presence in the schools. O'Donnell and White (2005) examined principal behaviors and their effect on teacher performance and student achievement. Their study of state assessment data demonstrated that student achievement in eighth grade mathematics and reading correlated positively with teacher perceptions of principal instructional leadership (O'Donnell & White, 2005).

Principal support for teachers is an important school dimension, and additional research is needed to examine the exact nature of supportive behaviors. The present study, built on House's (1981b) four-dimensional framework, Littrell's (1992) study, and DiPaola's (2012) work, creates a foundation for additional investigation of the dimensions of principal support perceived by teachers. Moreover, this study specifically connects principal support of teachers to math achievement in K–12 schools.

Dimensions of Principal Support

Principal support of teachers has many characteristics and interpretations. In order to further study principal support of teachers as it relates to specific variables, such as student achievement, a valid, reliable, and operational measure was needed. Social support is a difficult concept to define, although it is generally perceived. Through the framework first established by House (1981b), and later developed and applied to special education through Littrell's (1992) work, DiPaola (2012) has articulated the dimensions of principal support for teachers in the Principal Support Scale.

House's (1981b) theory of social support is a relevant framework to apply to the nature of teacher perceptions of principal support. He theorized that support has two dimensions: *expressive support*, which he defined as the degree of emotional and professional support teachers perceive; and *instrumental support*, the extent to which teachers perceive that time, resources, and constructive feedback provide support. House described social support as "an interpersonal transaction involving one or more of the following:

1. emotional concern (liking, love, empathy),
2. instrumental aid (goods or services),
3. information (about the environment), or
4. appraisal (information relevant to self-evaluation)" (p. 39).

Beginning with a conceptualization of social support, DiPaola (2012) examined House's (1981b) four dimensions of social support: emotional,

instrumental, informational, and appraisal. Next, DiPaola reviewed a study of support perceived by special education teachers (Littrell et al., 1994) which, in applying and confirming House's (1981) conceptual framework, created a link to using House's study in educational settings. Building on Littrell and colleagues' (1994) previous work, DiPaola (2012) developed, field-tested, refined, and applied an operational measure to assess teachers' perceptions of the support they receive from their principals. His Principal Support Scale (PSS) is a reliable ($\alpha = .95$) and valid measure of principals' social support (see Appendix A). The goals of the present study included confirming the factor structure and reliability of the PSS and adding to the existing body of literature on principal support. The study explored the relationship between teacher perceptions of principal support and student reading and math achievement in a sample of elementary, middle, and high schools.

METHOD

Sample

The fourteen K–12 schools in this study are part of a larger longitudinal study of principal leadership. The schools are located in rural or small city areas within 40 miles of a major university. Free and reduced-price lunch percentages range from 31% to 85% among the schools. Student populations varied; the smallest school had 295 students enrolled, and the largest had 1486 students.

Eight male and six female principals were involved in the study. Principals' administrative experience ranged from 4 to 25 years. The survey was administered to 790 teachers following a faculty meeting at each school. The number of teachers completing the survey at each level was approximately the same: 139 at elementary, 141 at middle, and 199 at high school. A total of 477 teachers participated in the survey, for a response rate of 60%.

Instruments

The Southeastern state in this study measures and reports student outcomes in a number of areas, including graduation rate, college readiness, and proficiency as determined by cut scores in reading by subject. The achievement measure used in this study, the Average Growth Index (AGI), is the only indicator used continually for all students through grade 12. The AGI is students' average progress as defined by the state's Value Added Assessment Scale (VAAS), measuring growth across grades, within a subject,

divided by the standard error of the average. This index is the mean difference between the predicted and actual scores. In other words, the AGI is the average difference for a school, divided by the standard error.

The PSS provided the operational measure of principal support. Researchers collected, recorded, and entered survey responses from each school into the Statistical Package for Social Sciences (SPSS) for data analysis. Descriptive statistics, presented in Table 7.1, were computed for the two factors and four dimensions of principal support identified by DiPaola (2012), as well as student achievement in math and reading according to the AGI.

Table 7.1. Descriptive Data for Dimensions of Principal Support, and Student Achievement

Variables	*M*	*SD*	*Min*	*Max*
Total PSS	4.79	1.09	1.0	6.0
Expressive Support	**7.52**	**1.67**	**1.5**	**9.0**
Professional Support	5.06	1.05	1.0	6.0
Emotional Support	4.99	1.19	1.0	6.0
Instrumental Support	**6.83**	**1.78**	**1.5**	**9.0**
Instrumental Support	4.52	1.26	1.0	6.0
Appraisal Support	4.62	1.21	1.0	6.0
AGI Math	4.93	8.80	–9.0	18.0
AGI Reading	2.79	5.35	–9.2	10.4

RESULTS

Mean scores were calculated for each of the 16 items of the PSS. In a factor analysis, two factors emerged with eigenvalues greater than 1, confirming House's (1981) two general factors of support: *expressive* and *instrumental*. In his study of principal support in high schools, DiPaola (2012) also identified two dimensions of the *expressive support* factor, which he labeled professional support and emotional support, and two dimensions of the *instrumental support* factor, which he labeled instrumental support and appraisal support. Cronbach's alpha coefficients of reliability were calculated for the two factors. Table 7.2 represents the results of the factor analysis of the principal support items.

Table 7.2. Factor Analysis of the Principal Support Scale

Item	*Factor I*	*Factor II*
Expressive Support		
Emotional Support Items		
Gives me a sense of importance—that I make a difference	.824	
Supports my decisions	.837	
Trusts my judgment in making classroom decisions	.815	
Shows confidence in my actions	.882	
Professional Support Items		
Gives me undivided attention when I am talking	.742	
Is honest and straightforward with the staff	.743	
Provides opportunities for me to grow professionally	.554	
Encourages professional growth	.599	
Instrumental Support		
Instrumental Support Items		
Provides time for various non-teaching responsibilities (e.g. IEPs, conferences, test students)		.845
Provides adequate planning time		.798
Provides extra assistance when I become overloaded		.806
Equally distributes resources and unpopular chores		.747
Appraisal Support Items		
Provides data for me to reflect on following classroom observations of my teaching		.542

(Table continues on next page)

Table 7.2. (Continued)

Item	*Factor I*	*Factor II*
Appraisal Support Items		
Provides frequent feedback about my performance		.592
Helps me evaluate my needs		.617
Provides suggestions for me to improve my instruction		.650
Eigenvalue	10.875	1.106
Cumulative Variance	67.97	74.89
Alpha Coefficient of Reliability	.941	.952

To examine the relationship between the dimensions of principal support and student achievement in math and reading, as measured by the AGI, a bivariate correlation was conducted. A Pearson correlation coefficient was computed to assess the relationship between the factored dimensions of principal support (*instrumental* and *expressive*) and AGI for math and reading among elementary, middle, and high school students. Student achievement in math was significantly correlated at the elementary school, $r(450) = .474$, $p < .05$, middle school, $r(450) = .384$, $p < .05$, and high school, $r(450) = -.770$, $p < .01$, levels. Similarly, results showed significant correlation for reading at the elementary school, $r(450) = .543$, $p < .01$, and middle school, $r(450) = -.505$, $p < .01$, levels, but not at the high school level. Moreover, while *instrumental* support was significant at all levels for math, a significant correlation did not exist for reading, and *expressive* support was only significant at the high school, $r(457) = -.106$, $p < .05$ level and for math, $r(431) = .121$, $p < .05$. Results of the bivariate correlational matrix are displayed in Table 7.3.

DISCUSSION

The data from this study confirmed the two dimensions of each of the *expressive* and *instrumental* factors identified in the prior high school study (DiPaola, 2012), as well as DiPaola's (2012) factor structure of the PSS—the dimensions of emotional and professional support for the *expressive factor* and the dimensions of instrumental and appraisal support for the *instrumental factor*. This sample differed in two ways from DiPaola's study, one of

Table 7.3. Bivariate Correlation Among Elementary, Middle, and High School for AGI Math and Reading Across Two Factors of Principal Support

	Level			*AGI*		*PSS Factors*	
	Elementary	*Middle*	*High*	*Math*	*Reading*	*Instrumental*	*Expressive*
Elementary	1	–.411**	–.543**	.474**	.543**	.138**	.066
Middle		1	–.543**	.384**	–.505**	.120*	.051
High			1	–.770**	–.003	–.236**	–.106*
Math				1	.302**	.215**	.121*
Reading					1	–.053	.009
Instrumental						1	.813**
Expressive							1

**Correlation is significant at the .01 level (2-tailed)

which increases the generalizability of DiPaola's findings across the K–12 spectrum. The sample size of 14 schools in this study was smaller than the 34 in the prior study, but the prior study's sample was comprised entirely of high schools. In the present study, the sample consisted of elementary, middle, and high schools, expanding the applicability of DiPaola's initial conclusions beyond just high schools.

Significant relationships were found between teachers' perceptions of principal support and student performance at all levels in math, but not at all levels in reading. According to the VAAS data analysts, it is not uncommon to see more variation in schools' effectiveness in math and other content-specific courses than in reading (National Center for Educational Statistics, 2013 [NCES], 2013). Consequently, students' reading scores may be more indicative of their cumulative learning throughout their years in school, rather than merely an indicator of one year's progress. Therefore, reading test scores are likely more stable, and reading growth more incremental, than math test scores and math growth. The more pronounced growth in math could also have been a result of increased instructional focus on math, which has resulted from state reorganization of math standards and adoption of new math assessments (NCES, 2013).

Significance

In the current climate of principal accountability and publicly reported results of student achievement, as measured by a metric at the state level, it is critical for school leaders to know how they can contribute to increasing

student achievement. Clearly, one way is by providing support to teachers. This study contributes to that knowledge by analyzing the relationship of the PSS's two factors and student performance, as measured by the AGI, and reported in a southeastern state.

This study confirmed the PSS as a reliable and valid measure of principals' social and emotional support of teachers. Previous studies of the PSS indicated that principal influence on teacher openness to change was significantly related to the instrumental dimension of principal support (Cagle, 2012; DiPaola, 2012). Additionally, in Tindle's (2012) study, the PSS showed a positive relationship between organizational citizenship and the *expressive* dimension of principal support. Therefore, by further validating an operational measure of an important construct related to principal support of teachers, the implications of the current study extend beyond student achievement, to teacher openness to change and organizational citizenship.

Student achievement on standardized assessments has become increasingly important under the policy mandates of the accountability movement. The southeastern state in this study, one of the first two Race to the Top states, was required to implement a rigorous teacher evaluation system incorporating student achievement as one of the indicators of teacher quality. Many easily identifiable factors that are frequently connected to student achievement, such as socioeconomic status, are outside the purview of teachers and school leaders to affect. However, with more highly refined tools, other influencers on student achievement can be identified that are possible for teachers and principals to change (McGuigan & Hoy, 2006). One of those tools, the PSS, reveals the potential for principals to improve student achievement by supporting their teachers.

REFERENCES

Akert, N., & Martin, B. N. (2012). The role of teacher leaders in school improvement through the perceptions of principals and teachers. *International Journal of Education, 4*(4), 284–299.

Andrews, R., & Soder, R. (1987). Principal leadership and student achievement. *Educational Leadership, 44*(6), 9–11.

Cagle, K. E. (2012). *Faculty perceptions of principal support and change: Orientation in Virginia Beach high schools* (Unpublished doctoral dissertation). The College of William and Mary, Williamsburg, VA.

DiPaola, M. F. (2012). Conceptualizing and validating a measure of principal support. In M. F. DiPaola & P. B. Forsyth (Eds.), *Contemporary challenges confronting school leaders* (pp. 111–120). Charlotte, NC: Information Age.

Harris, A. (2005). Teacher leadership: More than just a feel-good factor? *Leadership and Policy in Schools, 4*(3), 201–219.

House, R. J. (1981a). A path-goal theory of leader effectiveness. *Administrative Science Quarterly, 16*, 321–338.

House, R. J. (1981b). *Work stress and social support.* Reading, MA: Addison-Wesley.

Ingersoll, R. M., & Smith, T. M. (2004). Do teacher induction and mentoring matter? *NASSP Bulletin*, *88*(638), 28–40.

Leithwood, K., Seashore Louis, K., Anderson, S., & Wahlstrom, K. (2004). *How leadership influences student learning.* New York, NY: The Wallace Foundation. Retrieved from http://www.wallacefoundation.org/SiteCollectionDocuments/WF/Knowledge%20Center/Attachments/PDF/ReviewofResearch-LearningFromLeadership.pdf

Littrell, P. (1992). *The effects of principal support on general and special educators' stress, job satisfaction, health, school commitment, and intent on staying in teaching* (Unpublished doctoral dissertation). Virginia Polytechnic Institute and State University, Blacksburg, VA.

Littrell, P., Billingsley, B., & Cross, L. (1994). The effects of support on general and special educators' stress, job satisfaction, health, commitment, and intent to stay in teaching. *Remedial and Special Education*, *15*, 297–310.

Lunenburg, F. C. (2013) The principal as an instructional leader. *National Forum of Educational Administration & Supervision Journal*, *30*(2), 30–41.

Lynch, J. M. (2012). Responsibilities of today's principal: Implications for principal preparation programs and principal certification policies. *Rural Special Education Quarterly, 31*(2), 40–47.

McGuigan, L., & Hoy, W. K. (2006). Principal leadership: Creating a culture of academic optimism to improve achievement for all students. *Leadership and Policy in Schools*, *5*, 203–229.

National Center for Education Statistics (2013). The nation's report card: A first look: 2013 mathematics and reading (NCES 2014-451). Washington, DC: Institute of Education Sciences, U.S. Department of Education.

Nidus, G., & Sadder, M. (2011). The principal as a formative coach. *Educational Leadership, 69*(2), 30–35.

O'Donnell, R., & White, G. (2005). Within the accountability era: Principals' instructional leadership behaviors and student achievement. *NASSP Bulletin*, *89*(645), 56–71.

Protheroe, N. (2011). What do effective principals do? *Principal, 90*(5), 26–30.

Singh, K., & Billingsley., B. S. (2001). Professional support and its effects on teachers' commitment. *Journal of Educational Research, 91*, 229–239.

Tindle, J. A. (2012). *Dimensions of principal support behaviors and their relationship to organizational citizenship behaviors and student achievement in high schools* (Unpublished doctoral dissertation). The College of William and Mary, Williamsburg, VA.

von Frank, V. (Ed.). (2008). *Finding time for professional learning*. Oxford, OH: National Staff Development Council.

Appendix A: A Two-Factor Varimax Solution for the 16-item PSS

	Factor I	*Factor II*
EXPRESSIVE SUPPORT		
Emotional Items		
Gives me a sense of importance that I make a difference.	.822	
Supports my decisions.	.825	
Trusts my judgment in making classroom decisions.	.694	
Shows confidence in my actions.	.735	
Professional Items		
Gives me undivided attention when I am talking.	.774	
Is honest and straightforward with the staff.	.848	
Provides opportunities for me to grow professionally.	.700	
Encourages professional growth.	.893	
INSTRUMENTAL SUPPORT		
Instrumental Items		
Provides adequate planning time.		.811
Provides time for various nonteaching responsibilities.		.809
Provides extra assistance with I become overloaded.		.720
Equally distributes resources and unpopular chores.		.683
Appraisal Items		
Provides data for me to reflect on following classroom observations.		.652
Provides frequent feedback about my performance.		.735
Helps me evaluate my needs.		.755
Provides suggestions for me to improve instruction.		.574
Eigenvalue	11.312	1.478
Cumulative Variance	70.701	79.937
Alpha Coefficient of Reliability	.954	.955

Source: DiPaola (2012)

CHAPTER 8

PREDICTORS OF SCHOOL EFFECTIVENESS

Lauren Bailes

ABSTRACT

This inquiry will test the usefulness of organizational characteristics in predicting organizational effectiveness. Since organizational effectiveness measures quality and quantity of outputs, efficiency, adaptability, and flexibility of organizations, it stands to reason that when organizational traits support those outcomes, organizational traits also support overall effectiveness. Regression and correlation analyses reveal that, while these variables have a positive and significant relationship to overall effectiveness, the intervening relationships among the independent variables are complex but useful in furthering understanding of organizational studies.

Effectiveness is a vexatious term. Effectiveness should be a way to judge the health of organizations, but too often the application of the term results in more confusion than clarity. Assessments of effectiveness vary depending upon the organization, the context, and the era. Miskel, McDonald, and Bloom (1983) captured this problem in their observation, "Virtually every phase, process, and outcome variable can be and has been used as an

Leadership and School Quality, pp. 147–160

indicator of effectiveness" (p. 55). This is particularly true in school contexts. Such varied assessments as graduation rates, academic persistence, achievement, content mastery, and many others have been used to judge schools' effectiveness. Moreover, outcome measures can confound school achievement on standardized tests with variables arising from social influences, test alignment, and individual idiosyncrasy (Koretz, 2008; Nichols & Berliner, 2007).

Schools are not the only human-service institutions troubled by performance measures. The performance of other organizations, such as the Veterans Administration and National Aeronautics and Space Administration, has been recently challenged. Paul Mott (1972) addressed this problem conceptually and operationally by proposing that effectiveness be judged by those closest to the organization—its own members. To that end he devised an 8-item measure that has found substantial application in schools (Hoy & Miskel, 2013).

This inquiry will test the usefulness of organizational characteristics in predicting effectiveness when effectiveness is conceptualized as the judgments made by members of the quality and quantity of outputs, efficiency, adaptability, and flexibility of their own organizations. Specifically, this study examines the effects and interactions of four organizational characteristics on organizational effectiveness: mindfulness, teacher professionalism, organizational citizenship, and organizational justice. The rationale of this study is to investigate the idea that, given an increasing presence of variables so important to the operation of the school as mindfulness, teacher professionalism, organizational citizenship, and organizational justice, the organization will be seen to be effective.

THEORETICAL FRAMEWORK

This conceptual framework comprises five organizational constructs, the first of which assesses the overall success of an organization in meeting specific outcomes. The following four constructs measure the activities that subsequently influence an organization's mission. Those four organizational trait measures are: mindfulness, teacher professionalism, organizational citizenship, and organizational justice.

Organizational Effectiveness

For nearly 40 years, organizational effectiveness has been a valid and reliable measure of the internal success of organizations. Mott (1972) defined organizational effectiveness "as the ability of an organization to

mobilize its centers of power for action—production and adaptation" (p. 17). "Centers of power" comprise four aspects in any organization: quantity and quality of the product, efficiency (maximum output for minimum input), and the adaptability and flexibility of the organization. Miskel, Fevurly, and Stewart (1979) adapted Mott's (1972) work for application to schools as organizations. Prior to that adaptation, the literature indicated that outcomes of organizational effectiveness were multidimensional and might include other concepts like flexibility, productivity, and satisfaction. Miskel et al. (1979) applied this assumption of multidimensionality in their application to schools as organizations.

Despite its continued reliability, the definition of organizational effectiveness remained controversial, especially when researchers used the measure to examine schools. Hoy and Ferguson (1985) further refined the model by suggesting criteria for effectiveness at the school level: adaptation, goal attainment, integration, and latency. Hoy and Ferguson's model and the operationalization thereof relates strongly to Mott's (1972) index ($r = .75$) and shares some of its dimensions with components of the Mott index.

While student achievement may be considered as a measure of school effectiveness, it is not as useful a criterion for evaluating organizational effectiveness. Nichols and Berliner (2007), for example, suggest that student achievement measures, such as standardized tests, are far more representative of a student's socioeconomic status (SES) and other environmental factors than of the task of carrying out a school's mission. The use of a process measure of organizational effectiveness seeks to work around the validity problems identified by Nichols and Berliner.

Organizational Characteristics

Mindfulness. Mindfulness is operationalized at individual and organizational levels. Langer (1989) suggests that mindfulness is a way of decision-making that comprises the creation of new categories, openness to new information, and awareness of multiple perspectives. Weick and Sutcliffe (2007) extend Langer's work and apply it to organizations in their examination of high reliability organizations (HROs). Weick and Sutcliffe were most concerned about unexpected events that potentially develop into crises. Weick and Sutcliffe describe mindfulness as a continuing scrutiny of an organization's operations in which members search for failures, avoid generalizations, and are sensitive to nuances in the organizational environment. When problems arise, as they most assuredly will, mindful organizations meet problems with resilience and expertise (Hoy, Gage, & Tarter, 2006).

Teacher professionalism. Teacher professionalism describes the teacher-to-teacher interactions within a school. As professional teacher behavior increases, one would expect to see greater professional respect and collegiality within the teacher cadre as well as teachers who work with enthusiasm and commitment to the students. This concept and its measure come from two themes of the climate literature—openness and health—whose measures were subjected to a second-order factor analysis to clarify some theoretical overlap between the Organizational Climate Descriptive Questionnaire and the Organizational Health Index instruments (Hoy & Sabo, 1998; Hoy, Smith, & Sweetland, 2002). The focus of teacher professional behavior is on intrafaculty relationships, rather than on faculty members' relationships with administrators or students, though there is some slight overlap.

Organizational citizenship. Organizational citizenship, a term first coined by Bateman and Organ (1983), quickly entered research about organizational behavior (Organ & Ryan, 1995). It describes the category of employee behaviors that is neither prescribed nor mandated but nevertheless occurs and betters the organization and other individuals. A measure of organizational citizenship behavior was developed that reflected a dual-concept model. One dimension of the model reflected benefits to the individual and the other dimension reflected benefits to the organization. However, DiPaola and Tschannen-Moran (2001) found that there is really only one dimension—a single, bipolar construct—in organizational citizenship that reflects the benefits to both individual and organization. Organizational citizenship is positively related to student achievement (DiPaola & Hoy, 2005a), collegial leadership, achievement press (DiPaola & Hoy, 2005b), and teacher trust in colleagues and organizations (Tschannen-Moran & Hoy, 2000).

Organizational justice. Organizational justice measures how individuals perceive fairness within an organization. Justice is subdivided into two categories: distributive justice (fairness in distribution of goods) and procedural justice (fairness in the process of distributing goods) (Greenberg, 1996). Organizational justice is impossible without teacher trust in colleagues (Hoy & Tarter, 2004).

HYPOTHESES

Hypothesis 1: Mindfulness is positively and significantly related to overall effectiveness.

Mindful organizations have been empirically associated with trust in schools (Hoy, Hannum, & Tschannen-Moran, 1998) and mindful leadership (Hoy, 2003). Because both trust and leadership are organizational factors related to student achievement and other school performance outcomes (Hoy, Gage, & Tarter, 2006), it stands to reason that mindfulness or enabling qualities in organizations also contribute to higher levels of student achievement.

Hypothesis 2: Organizational citizenship behavior is positively and significantly related to overall effectiveness.

One dimension of organizational effectiveness is its simultaneous interest in both quality and quantity of output. As service organizations, schools cannot be solely focused on quantity of outputs at the expense of quality, because output quality assumes different forms in a school. This speaks to the unofficial and yet freely enacted attitudes of "all for one and one for all" present in organizations where citizenship behavior is a regular occurrence. As a result, the organization is also more effective than organizations where this additional activity may not take place.

Hypothesis 3: Organizational justice is positively and significantly related to overall effectiveness.

Again, this organizational variable echoes aspects of organizational effectiveness. Because schools, as organizations, produce such a variety of goods and services, it is a mark of efficiency (and thus, of organizational effectiveness) that the mission of the school stays central to the decision-making process. This decision-making process is part of organizational justice: faculty members expect that individual expectations are subordinated to the objective of the organization and that decisions are made to that end.

Hypothesis 4: Teacher professionalism is positively and significantly related to overall effectiveness.

Autonomy and self-governance are valued in professional organizations; when teachers are unencumbered by regulation, they are free to innovate and hone their expertise, thereby maximizing their own output and growing more efficient. In so doing, they make the organization better and more effective.

Hypothesis 5: Jointly, all four organizational variables contribute to and are positively related to overall effectiveness.

After the descriptions of the variables above and the rationale for linking them in the aforementioned hypotheses, it should not be surprising that all of these organizational variables share features and underlying qualities. Therefore, presence/strength of the four variables should correlate with organizational effectiveness?

METHODS

This section details the sample, measures, and analytics methods used to test the hypotheses.

Sample

Data were collected from a sample of 86 public elementary schools in a southeastern state. Although data were collected at the individual level, they have been aggregated to the organizational level. There are 128 county and city school systems in this state. Of the total number of school systems, 23 elected to participate, comprising 18% of the total school systems in the state. The sample is not random, but it is representative of state average data with regard to size, SES, urbanity, location, number of teachers, and teacher experience. Out of a total state enrollment of 741,000, 56% of students are eligible for free and reduced lunch (the measure of SES used for this study); our sample was nearly equal to this percentage.

Data Collection

Teachers were informed that responses were anonymous, confidential, and that their answers could not be traced to them. Survey responses were collected during regularly scheduled faculty meetings and nearly all teachers agreed to participate (greater than 90% response rate). Data were collected on two forms versions of the same form so that adjacent teachers did not complete the same form.

Measures

Organizational effectiveness. The School Effectiveness Index (or SE-Index) refines Mott's (1972) dimensions of organizational effectiveness, which were first found to be reliable in his hospital studies. Miskel et al. (1979) used this scale for schools until it was further refined by Hoy and

Ferguson (1985). The current iteration is an 8-item Likert scale on which teachers rank their assessment of various aspects of the school from strongly disagree to strongly agree. The SE-Index measures the extent to which faculty members perceive the school to be effective in terms of processes and outcomes. Sample items include, "The *quality* of products and services produced in this school is outstanding," "Most everyone in the school *accepts* and *adjusts* to changes," and "Teachers in this school use available resources *efficiently*." This scale has consistently high reliability in the range of .87 to .89 and the scale's validity has been further supported in studies assessing multiple effectiveness criteria (Hoy & Ferguson, 1985).

Mindfulness. This organizational variable is measured by a 14-item Likert scale (the M-scale), which assesses the degree to which the organization (school) carries out its mission mindfully. That is, to what degree individuals within the organization anticipate error, prevent errors from escalating into crises, resist oversimplification, and remain open to diverse perspectives. Teachers select one of six answers ranging from strongly disagree to strongly agree. M-scale items include, "When a crisis occurs the principal deals with it so we can get back to teaching." This item, which is reverse scored, measures the way that school leaders protect the central work of the school (teaching and learning) from crises. Another sample item is, "Teachers in my building learn from their mistakes and change so they do not happen again," which gauges the degree to which the school anticipates error and changes its practices once an error has occurred. If scores on the M-scale are high, mindfulness is high. Hoy, Gage, and Tarter (2004) show this scale to have high reliability (.90 or greater) and three factors analyses further support the construct validity of this measure.

Organizational justice. This organizational variable is measured by a 10-item Likert scale, which is called the Organizational Justice Scale (OJS). The OJS captures how teachers perceive the fairness of the school. Fairness is defined as the degree to which goods are perceived fairly distributed (distributive justice) and the perceived fairness of the distribution processes in the organization (procedural fairness). Teachers select one of six answers, ranging from strongly disagree to strongly agree. Examples of OJS items include, "The principal treats everyone with respect and dignity," which measures distributive justice and, "Teachers are involved in decisions that affect them," which measures procedural justice. Hoy and Tarter (2004) found this scale to be highly reliable (.90 or greater) and further factor analysis has supported construct validity.

Organizational citizenship. This organizational variable is measured by a 12-item Likert scale (the Organizational Citizenship Behavior [OCB] scale) which measures the extent to which teachers and faculty at the school participate in organizational citizenship behavior, such as helping colleagues, spending time with students outside of class, and other

nonmandated but beneficial behaviors. Teachers select one of six answers ranging from strongly disagree to strongly agree. Sample items include, "Teachers help students on their own time" and "Teachers make innovative suggestions to improve the overall quality of our school"—these items tap into both poles of the organizational citizenship behavior construct, which includes benefits to both individuals (students, in this case) and the organization as a whole. DiPaola, Tarter, and Hoy (2005) found this scale to be highly reliable (consistently between .86 and .93); additionally, three factor analyses have supported this measure's construct validity.

Teacher professionalism. This organizational variable is measured by an 8-item Likert scale (the P-Index), which evaluates professional behavior of teachers. Professionalism is described as the degree to which teachers act according to the norms, expectations, and ethics that govern the field. Teachers select one of six answers ranging from strongly disagree to strongly agree. Sample items include, "Teachers have a responsibility to participate in curriculum decisions in the district" and "My colleagues do not give me a lot of credit for being an effective teacher (reverse scored)." McMahon and Hoy (2009) established a very strong reliability coefficient of .81 for this measure and its construct validity has been supported by further factor analysis.

Data Analysis

This quantitative study examines the relationships among organizational effectiveness, mindfulness, teacher professionalism, organizational citizenship, and organizational justice. Individual responses have been aggregated into school-level means. Factor analysis was used to identify the number of factors and the items with the highest loadings for each variable tested, and then a series of regression analyses was used to test the hypotheses.

Model Development

In order to develop a predictive model, this study employs a series of regression analyses. Regression analyses, unlike structural equation modeling (SEM), do not have the benefit of testing multiple relationships simultaneously or assessing the fit of relationships with fit indices. Nevertheless, an experimental path developed through a series of regression analyses still provides the opportunity to advance a theory of how organizations facilitate the development of overall effectiveness. There is a strong theoretical argument to be made for the inclusion of mindfulness

as a predictor of overall effectiveness. While one aspect of mindfulness includes anticipation of unexpected events, this construct also involves openness to change, resistance of oversimplification, and awareness of multiple perspectives.

It could be argued that mindfulness does not fit with the other predictors because it includes a fixation on the negative—what has gone wrong and what could go wrong. It still stands to reason that there could be a mediated relationship among some of the other variables as they predict overall effectiveness. Organizational justice involves teachers' perceptions about the fair distribution of goods and the fairness of the distribution mechanism. If teachers believe the principal treats all fairly and that there is no favoritism, it seems likely that they would also be vigilant in their protection of the organization. Similarly, if teachers believe that the distribution of goods is largely ethical (organizational justice), they may also be likely to demonstrate more openness to feedback, value professional development, and offer their colleagues credit for jobs well done (teacher professionalism).

Both teacher professionalism and mindfulness share theoretical underpinnings with organizational citizenship. Teachers who value collegiality and engage with professional development (teacher professionalism) are likely to offer unpaid expert services to benefit the organization, a mark of organizational citizenship. Similarly, teachers who believe people in the school value knowledge and diversity of opinion over power (mindfulness) could be the same individuals who voluntarily mentor new teachers or make innovative suggestions to improve the quality of a school. Both teacher professionalism and mindfulness, then, mediate the association between organizational justice and overall effectiveness.

Finally, there is a clear path from organizational citizenship to the outcome variable, overall effectiveness. If an organization is made of people who carry out non-required behaviors to benefit both an organization and its clients (the school and its students), that organization is also likely to be judged as efficient and effective by its key stakeholders (teachers).

This quantitative study examines the relationships among organizational effectiveness, mindfulness, teacher professionalism, organizational citizenship, and organizational justice. Factor analysis was used to identify the number of factors and the items with the highest loadings for each variable tested and then zero order correlations and regression analyses were used to test the hypotheses and the fitness of the theoretical model.

This study tested a theoretically coherent group of predictor variables and their individual and collective effect on a complex independent variable. It is important to note that, in this data set, SES has no relationship to overall effectiveness. This was evident in the regression analysis: when regressed with the other predictor variables, SES, as measured by students'

qualification for free and reduced lunch, did not predict effectiveness (β = –.079, *ns*) (see Table 8.2), although there was a significant bivariate relationship (r = -.34, p < .01) between free/reduced lunch and effectiveness (see Table 8.1).

Table 8.1. Correlations of all Variables in Study (*n* = 84)

Variable	*TProf*	*OrgJust*	*OrgCit*	*Mind*	*Effective*
F/RL	–.118	–.296**	–.310**	–.330**	–.344**
TProf	–	.387**	.510**	.446**	.449**
OrgJust		–	.688**	.889**	.659**
OrgCit			–	.777**	.836**
Mind				–	.730**

* = p <.05; ** = p <.01

RESULTS

Each of the five hypotheses was substantiated by the analyses: individually and collectively, the four predictor variables had a positive and significant relationship to overall effectiveness (adjusted R^2 = .694). However, only organizational citizenship made a positive, significant, and unique contribution to effectiveness (β = .667). When organizational citizenship was regressed on the remaining variables (adjusted R^2 = .607) only teacher professionalism (β = .210) and mindfulness (β = .666) made unique and significant contributions to organizational citizenship. In a further zero order correlation testing of the predictor variables and overall effectiveness, there is a significant relationship between overall effectiveness and organizational justice (β = .659, p = .01) (see Figure 8.1).

DISCUSSION

Organizational effectiveness comprises several dimensions, including quality and quantity of outputs, efficiency (defined as the most output for the least input), adaptability, and flexibility. Teacher professionalism and organizational citizenship share some of those same dimensions. It is reasonable, then, for school leaders and teachers to shape practice and professional development along those shared dimensions so that as schools grow in professionalism and citizenship, they are also progressing toward broader goals of organizational effectiveness.

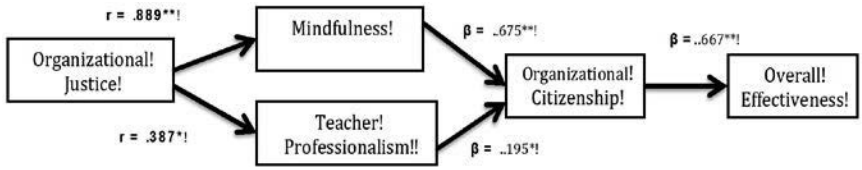
Table 8.2. All Independent Variables Regressed on Overall Effectiveness

Variable Name	*Teacher Professionalism (Tprof)*	*Organizational Justice (Orgjust)*	*Organizational Citizenship (Orgcitz)*	*Mindfulness (Mind)*
β	.019	.058	.667**	.150

Mindfulness, Organizational Justice, and Teacher Professionalism Regressed on Organizational Citizenship

Variable Name	*Teacher Professionalism (Tprof)*	*Organizational Justice (Orgjust)*	*Mindfulness (Mind)*
β	.210**	.007	.666**

* = $p < .05$; ** = $p < .01$



* = $p < .05$; ** = $p < .01$

Figure 8.1. Exploratory path.

The five hypotheses were tested using a series of regression analyses. Those analyses revealed that each of the four predictor variables form a complex path in the explanation of effectiveness. When effectiveness was regressed on the predictor variables, only organizational citizenship had a unique influence on the perception of effectiveness. The more effort that teachers put into their work, beyond that which is contractually required or for which they are paid, the more effective the organization is. With only these two variables, causation is ambiguous, but it appears that teachers commit more to organizations that they see as effective. Clearly, from the regressions, teacher professionalism and mindfulness contribute to effectiveness, but in a way that is mediated by citizenship. The path begins with organizational justice, which suggests that neither mindfulness nor teacher professionalism are likely to emerge in a school where the faculty feel they are treated unfairly.

This study's generalizability is limited because SES was not included in the exploratory path model. The correlations reveal that SES is related

to effectiveness, as well as to each of the predictor variables, save for teacher professionalism. In order to make claims about the causal nature or arrangement of these organizational characteristics, a follow-up study would have to include SES as a predictor of organizational effectiveness. Additionally, regression analyses do not allow the assessment of model fit with various fit indices. While the results of this study are promising for the development of future theory, subsequent studies must take up the question of model fit, which would best be assessed with structural equation modeling.

Organizational effectiveness shares features of each independent variable and these shared qualities were the impetus for the above hypotheses. Turning again to the literature, there may be explanations for why the variables seem to be related in such a particular path (see Figure 8.1). A key feature of mindfulness is a driving and pervasive sensitivity to failure, a benefit to organizations when it results in conscientiousness and resilience, both of which manifest themselves in greater degrees of enabling school structure and trust. Behaviors that demonstrate organizational citizenship may be what Weick and Sutcliffe (2007) define as "strong responses to weak signals in the interest of reliable functioning" (p. 47). This may explain some of the relationship between mindfulness and organizational citizenship.

Likewise, it is a mark of professionalism that teachers have the "autonomy to make decisions based on expertise and client interest" (Geist & Hoy, 2004, p. 6). It stands to reason that some of those decisions may overlap with unprompted but widely beneficial individual choices that signify organizational citizenship. This may explain the relationship between teacher professionalism and organizational citizenship, but further study of each variable's factor structure would increase clarity on this issue.

Organizational justice, although its effect on overall effectiveness is most diffuse, was still found to be a predictor. The literature and survey items on the OJS seem to reflect teacher perceptions of leader behaviors. These items tend to be different than the items for either organizational citizenship (all 12 items refer to teacher behaviors) or teacher professionalism (all eight items refer to "colleagues" or "I"), as those items refer to collective peer behaviors and not to perceptions of leadership behavior in the organization. This may explain why organizational justice is least significant with regard to predicting organizational effectiveness.

This chapter shows an empirical relationship among four important concepts. Organizational effectiveness comprises several dimensions, including quality and quantity of outputs, efficiency, adaptability, and flexibility. Teacher professionalism and organizational citizenship share some of those dimensions. It is reasonable, then, for school leaders and teachers to shape practice and professional development along those shared

dimensions so that as schools grow in professionalism and citizenship, they are also progressing toward broader goals of organizational effectiveness.

REFERENCES

Bateman, T. S., & Organ, D. W. (1983). Job Satisfaction and the good soldier: The relationship between affect and employee "citizenship". *Academy of Management Journal*, *26*(4), 587–595.

DiPaola, M. F., & Hoy, W. K. (2005a). School characteristics that foster organizational citizenship behavior. *Journal of School Leadership*, *15*(4), 387–406.

DiPaola, M. F., & Hoy, W. K. (2005b). Organizational citizenship of faculty and achievement of high school students. *High School Journal*, *88*(3), 35–44.

DiPaola, M. F., Tarter, C. J., & Hoy, W. K. (2005). Measuring organizational citizenship of schools: The OCB scale. In W. Hoy & C. Miskel (Eds.), *Educational Leadership and Reform, 4* (pp. 319–341). Greenwich, CN: Information Age Publishing.

DiPaola, M. F., & Tschannen-Moran, M. (2001). Organizational citizenship behavior in schools and its relationship to school climate. *Journal of School Leadership*, *11*, 424–447.

Geist, J. R. H., & Wayne K. (2004). Cultivating a culture of trust: enabling school structure, teacher professionalism, and academic press. *Leading & Managing*, *10*(1), 1–17.

Greenberg, J. (1996). *The quest for justice on the job: Essays and experiments*. Thousand Oaks, CA: Sage.

Hoy, W. K., & Tarter, C. J. (2004). Organizational justice in schools: No justice without trust. *International Journal of Educational Management*, *18*, 250–259.

Hoy, W. K. (2003). An analysis of enabling and mindful school structures: Some theoretical, research and practical considerations. *Journal of Educational Administration*, *41*(1), 87–109.

Hoy, W. K., & Ferguson, J. (1985). A theoretical framework and exploration of organizational effectiveness of schools. *Educational Administration Quarterly*, *21*(2), 117–134.

Hoy, W. K., Gage, C. Q., III, & Tarter, C. J. (2006). School mindfulness and faculty trust: Necessary conditions for each other? *Educational Administration Quarterly*, *42*(2), 236–255.

Hoy, W. K., Hannum, J., & Tschannen-Moran, M. (1998). Organizational climate and student achievement: A parsimonious and longitudinal view. *Journal of School Leadership*, *8*(4), 336–359.

Hoy, W. K., & Miskel, C. G. (2013). *Educational administration: Theory, research, and practice* (9th ed.). New York, NY: McGraw-Hill.

Hoy, W. K., & Sabo, D. J. (1998). *Quality middle schools: Open and healthy*. Thousand Oaks, CA: Corwin Press.

Hoy, W., K., Smith, P. A., & Sweetland, S. A. (2002). The development of the organizational climate index for high schools: its measure and reliability to faculty trust. *High School Journal*, *86*, 38–49.

Koretz, D. (2008). *Measuring up: What educational testing really tells us.* Cambridge, MA: Harvard University Press.

Langer, E. J. (1989). *Mindfulness*. Reading, MA: Addison-Wesley.

Miskel, C., McDonald, D., & Bloom, S. (1983). Structural and expectancy linkages within schools and organizational effectiveness. *Educational Administration Quarterly*, *19*(1), 49–82.

Miskel, C. G., Fevurly, R., & Stewart, J. (1979). Organizational structures and processes, perceived school effectiveness, loyalty, and job Satisfaction. *Educational Administration Quarterly, 15*(3), 97–118.

Mott, P. E. (1972). *The characteristics of effective organizations.* New York, NY: Harper & Row.

Nichols, S. L., & Berliner, D. C. (2007). *Collateral damage: How high-stakes testing corrupts America's schools*. Cambridge, MA: Harvard Education Press.

Organ, D. W., & Ryan, K. (1995). A meta-analytic review of attitudinal and dispositional predictors of organizational citizenship behavior. *Personnel Psychology*, *48*(4), 775–802.

Tschannen-Moran, M. (2009). Fostering teacher professionalism in schools: The role of leadership orientation and trust. *Educational Administration. Quarterly*, *45*(2), 217–247.

Tschannen-Moran, M., & Hoy, W. K. (2000). A Multidisciplinary Analysis of the nature, meaning, and measurement of trust. *Review of Educational Research*, *70*(4), 547–593.

Weick, K. E., & Sutcliffe, K. M. (2007). *Managing the unexpected: resilient performance in an age of uncertainty.* San Francisco, CA: Jossey-Bass.

CHAPTER 9

SCHOOL EFFECTIVENESS

A Meta-Analytic Review of Published Research

Roxanne M. Mitchell, Jingping Sun, Sijia Zhang, Brenda Mendiola, and C. John Tarter

ABSTRACT

A meta-analysis was conducted of published studies over the past 30 years, related to school effectiveness, that have used the Index of Perceived Organizational Effectiveness (IPOE). Five categories of factors related to school effectiveness were identified: leadership, teacher characteristics, organizational features, community influence, and contextual variables. Teacher characteristics such as trust, efficacy, and collegiality had the strongest relationship with effectiveness. Additionally, there was a significant relationship between perceptions of effectiveness and student achievement.

Never has the study of effective schools been more pressing. The recent emphasis on accountability, No Child Left Behind legislation, and increased interest in alternatives such as private schools, charter schools, home

Leadership and School Quality, pp. 161–169

schooling, and parent choice initiatives are evidence of the widespread concern over the failure of schools to successfully educate an increasingly diverse population of students. Even though a great deal of attention being placed on student achievement as an indicator of school effectiveness, there is no consistent definition about what constitutes an effective school (Uline, Miller, & Tschannen-Moran, 1998). Nichols and Berliner (2007) and Glass (2008) have both documented the insidious consequences of overly narrow and politically-driven definitions of effectiveness.

Most of the research on school effectiveness over the past four decades has been conducted by researchers who set out to challenge the assumptions of the Coleman Report (Coleman et al., 1966), which blamed differences in academic performance on student demographics, student socioeconomic status (SES), and factors outside of the school's control. Researchers such as Brookover and Lezotte (1979) and Edmonds (1979) launched the Effective Schools Movement, which pointed to conditions that were common among successful schools situated in high poverty neighborhoods. Researchers identified strong principal leadership, high academic expectations, a common emphasis on instruction, a safe and orderly environment, frequent assessment, a clear and focused mission, positive school and home relations, and an emphasis on protecting student time on task as indicators of effective schools (Edmonds, 1979; Lezotte, 2001). This line of research, although it contributed to the research on effective schools, was criticized for its lack of a strong empirical base. Other researchers attempted to strengthen the empirical study of school effectiveness by broadening the study of school effectiveness to include the perceptions of teachers within schools. Miskel, Fevurly, and Stewart (1979) applied Mott's (1972) perceived organizational effectiveness framework to schools. They defined school effectiveness as "the subjective evaluation of a school's productivity, adaptability, and flexibility" (p. 98), and they adapted Mott's *Index of Effectiveness* (IOE) (1972) and applied it to schools calling it the *Index of Perceived Organizational Effectiveness* (IPOE) (1979). This work spawned several published and unpublished studies that have explored school effectiveness using this framework.

STATEMENT OF PURPOSE

The purpose of this chapter is to conduct a meta-analytic review of the findings from published studies on school effectiveness that have used the IPOE and this theoretical framework to explore both the antecedents and the consequences of perceived school effectiveness. To this end, the findings from 12 published studies, dating from 1979 to 2011, will be reviewed. These studies have been published in leading journals such as *Educational*

Administration Quarterly, the *Journal of Educational Administration*, and the *Journal of School Leadership*.

THEORETICAL FRAMEWORK

Mott (1972) described organizations as consisting of centers of power or authority which could vary considerably from being very centralized to being diffused throughout the organization. For Mott, organizational effectiveness was defined as "the ability of the organization to mobilize its centers of power for action, production and adaptation" (p. 17). This is not unlike earlier definitions of organizational effectiveness by Steers (1975) and Hage (1965) that defined organizational effectiveness as consisting of factors such as adaptability, flexibility, productivity, job satisfaction, and efficiency. Central to these definitions is the notion that in order for an organization to be effective, it must be productive, which means that it must be able to accomplish its goals in an effective and efficient manner; it also must be adaptive, which means that it must be able to shift with changing demands and it must be able to anticipate potential problems; finally, it must be flexible, which means that it must be able to adjust to external and internal pressures quickly and be able to bounce back from unexpected occurrences (Miskel et al., 1979). According to Miskel, McDonald, and Bloom (1983), when applied to schools, productivity can refer to the strength of the quality of instruction, learning, and extracurricular events. Adaptability refers to the ability of the school to stay abreast of educational changes and demands, and to devise timely solutions to address potential problems that could arise as a result of these changes. Flexibility refers to the schools ability to cope with the unexpected and to deal with crisis situations in an efficient and effective manner.

Hoy and Ferguson (1985) pointed out that organizational effectiveness is complex and multidimensional. They suggested that the traditional view of organizational effectiveness was that organizations were considered effective to the extent that they accomplished their goals. On the other hand, the systems view was that organizations exist in a very demanding and complex environment and, as such, effectiveness according to these theorists was described as the organization's ability to survive and thrive amid competing demands and ever-changing expectations. Drawing substantially from the Parsonian pattern variables (Parsons, 1960, as cited in Hoy & Ferguson, 1985) and subsequent theorists influenced by Parsons (1960). Hoy and Ferguson (1985) synthesized these two models into a perspective on school effectiveness consisting of four dimensions: adaptation, goal attainment, integration, and latency (AGIL). According to their theory, adaptation referred to the schools' innovativeness and flexibility,

which researchers measured by the *Index of Perceived Organizational Effectiveness* IPOE. Goal attainment was most often measured by how well a school did on standardized achievement tests. Integration referred to the ability of the faculty to cooperatively work together and collaborate on instructional and administrative tasks. Latency referred to the ability of the school to foster and sustain high levels of motivation and organizational commitment among faculty members (Hoy & Ferguson, 1985). Based on this framework, this study asked two questions:

1. What are the factors associated with perceived organizational effectiveness in published studies?
2. What is the relationship between perceived school effectiveness, as measured by the IPOE, and student outcomes, such as achievement on standardized tests?

METHOD AND ANALYSIS

Meta-analysis is a systematic set of methods for synthesizing the results of empirical studies. Compared with traditional qualitative review methods, meta-analytic procedures display the landscape of a research domain, keep statistical significance in perspective, minimize wasted data, analyze the distribution of research results, ask focused research questions, and find moderator variables (Rosenthal, 1991; Rosenthal & DiMatteo, 2001). Despite considerable variation in execution, scholars generally agree that the basic procedures involved in meta-analysis include:

1. An exhaustive search for related literature and the selection of a body of studies to be analyzed using appropriate inclusion criteria;
2. Systematic coding of the characteristics of studies, effect sizes, and related statistics;
3. Calculation of the mean effect size;
4. Conducting homogeneity and heterogeneity analysis of the effect size distribution variances and moderator testing.

Our study followed this framework. We chose the Pearson correlation coefficient r as the basic form of effect size, representing the correlational relationship between the antecedents and school effectiveness. Weighted means were calculated to reduce sampling error. Fisher z transformations were conducted to adjust the effect sizes. The achieved sample of schools was used as the sample size for each study. The internal and external validity of this study was enhanced by exhaustive, appropriate inclusion

of sampled studies and calculation of weighted means (Lipsey & Wilson, 2001).

Comprehensive Meta-Analysis software was used to perform meta-correlation computations. Both fixed effects models (FEM) and mixed effects models (MEM) or random effect models (REM) were used. The findings from the best models were reported. The evidence reviewed was provided exclusively by published articles. Although published evidence may be associated with publication bias, the quality of the studies and exhaustion of all published studies counterbalances this potential weakness. Major online databases (e.g., ERIC) and major journals in the field of educational administration were exhausted. Included in this review are all published studies that have been completed and reported in the last 30 years and that:

- were based on quantitative data;
- used at least one of the following types of statistical analyses: correlation, regression, or *t*-test; and
- investigated the effects and antecedents of school effectiveness as measured by IPOE or its akin measures.

Finally, 10 published studies were located and used in this meta-analytic review. The findings of this review were based on 20 rounds of meta-analyses and narrative review.

HIGHLIGHTS OF FINDINGS

More than 50 analyses examined the 40 antecedents of school effectiveness. Table 9.1 shows the result. We classified these antecedents into five categories: (1) school leadership (4 variables); teachers' characteristics (7 variables); (3) organizational features (12 variables); (4) community influence (1 variable); and (5) school contextual factors (12 variables). For 11 of these school variables, sufficient evidence was available to permit meta-analyses. Overall, school leadership in various forms, such as collegial leadership, supportive leadership, and principal leadership (e.g., Miskel et al., 1979), had a moderate, positive correlation to school effectiveness (weighted mean $r = .40$). Teachers' characteristics had a large correlation to school effectiveness (weighted mean $r = .50$) according to Cohen's (1988) conventional standards. Three teacher-related variables were most influential in enhancing school effectiveness. They were *teacher trust* (.63), *teacher collective efficacy* (.53), and *faculty collegiality* (.51), in descending order of value of the weighted mean r. Organizational features had a moderate correlation to school effectiveness (weighted mean $r = .38$). The three

Table 9.1. The Antecedents of School Effectiveness and Their Correlations the IPOE

Antecedents (21)	*Correlationson the IPOE*
School Leadership	**.49***
Teachers' Characteristics	**.50*****
Trust	**.63***
Teacher Collective Efficacy	**.53***
Loyalty	.61*
Faculty Collegiality	**.51****
Job Satisfaction	**.54***
Teacher Empowerment	**.26***
Teacher Leadership	.20*
Organizational Features	**.38***
Organizational Citizenship	.65***
Enabling Structure	**.56***
Illegitimate Politics	**–.55****
Academic Press	.52**
Collaboration	.51***
Healthy School	**.47***
Curriculum Organizational Structure	.40***
Linkages	.24
Centralization	–.20
Student Climate/Attitude	.22*
Formalization	.15
Complexity	.07
Community Influence	
Environmental Press	.08
Contextual Factors	
Social Economic Status	.33**
School Size	.00
School Type	.25*
School Level	.33*
Teacher Years Experience	–.31*
Teacher Gender	–.35*

Note: Although we used "impact" or "antecedents" to denote the relationships in this review, the relationships examined are correlational.

* $p < .05$; ** $p < .01$; *** $p < .001$

organizational variables most influential in enhancing school effectiveness were *academic emphasis* (.62), *enabling structure* (.56), and a *healthy organization* (.53) in descending order of value of the weighted mean *r*. Community (i.e., *environmental press*) had no significant correlation to school effectiveness. Among the 12 school contextual factors examined, school effectiveness is malleable to students' *social economic status* (.33**), *school level* (.33**), and *school type* (.25*), based on limited evidence. Teachers' years of working experience and teachers' gender also significantly influenced school effectiveness. Our findings suggest that leaders influence school effectiveness mainly through building trust and collegiality, through their supportive and collegial leadership, by emphasizing academic excellence, by building enabling structures, and by improving organizational health. Based on four studies, school effectiveness had significant, close to large effects on student learning as measured by state standardized tests (weighted mean $r = .40$) (see Table 9.2).

Table 9.2. The Impacts of the Index of School Effectiveness on Student Achievement

Overall Effect	*N of Studies*	*Weighted Mean r*	*Standard Error for z_r*	*95% Confidence Interval*		*Q*	*df*	*P*
				Lower End r	*Upper End r*			
Fixed Model	4	.40	.04	.37	.51	22.56*	5	.00

Note: Although we used "impact" or "antecedents" to denote the relationships in this review, the relationships examined are correlational.

* $p < .05$; ** $p < .01$; *** $p < .001$

DISCUSSION

This study, by meta-analytically reviewing the effects of leader, teacher, school, and contextual variables on school effectiveness, identified the key factors that contribute to school effectiveness. The findings add to our understanding of the process by which leaders improve school effectiveness and teachers and, in turn, improve school effectiveness and student learning. This study identifies school effectiveness as one significant producer of student learning and provides relatively robust evidence about whether school effectiveness warrants significant attention in our efforts to improve student learning. As well, this study informs school administrators and policy makers who want to improve school effectiveness as a way to enhance student learning outcomes.

Our findings support earlier findings by Hoy, Tarter, and Witkoskie (1992) and Tarter, Sabo, and Hoy (1995) that demonstrated the important link between faculty trust in the principal and colleagues and perceived school effectiveness. In fact, this review demonstrated that teacher trust was the most powerful predictor of school effectiveness. Moreover, our study is the first known study that has reviewed the empirical literature on school effectiveness and examined the relationship of leadership variables, teacher characteristics, organizational factors, community influence, and school contextual factors and perceived school effectiveness. This study also points to the link between perceived organizational effectiveness as measured by the IPOE and student achievement. A large amount of the research over the past thirty years that has been conducted on school effectiveness appears in unpublished studies. Future research that looks at data from these studies should help to broaden our understanding of both the antecedents and effects of perceived school effectiveness. The findings of this study, although limited to only a few empirical pieces, are provocative and suggest key areas of the school context that are strongly related to both perceptions of effectiveness and to student achievement.

REFERENCES

Brookover, W. B., & Lezotte, L. W. (1979). Changes in school characteristics coincident with changes in student achievement. Occasional Paper No. 17. East Lansing, MI: The Institute for Research on Teaching, Michigan State University.

Brown, R. S., Claudet, J. G., & Olivarez, A. (2002). Investigating organizational dimensions of middle school curricular leadership: Linkages to school effectiveness. *Research in Middle Level Education Online*, *26*(1), 1–13.

Coleman, J. S., Campbell, E. Q., Hobson, C. J., McPartland, J., Mood, A. M., Weinfeld, F. D., et al. (1966). *Equality of educational opportunity*. Report issued by the Educational Testing Service: Department of Health, Education, and Welfare, Office of Education. Washington, DC: U.S. Government Printing Office.

Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). Hillsdale, NJ: Erlbaum. doi:10.4324/9780203771587

Edmonds, R. (1979). Effective schools for the urban poor. *Educational Leadership*, 15–24.

Glass, G.V. (2008). *Fertilizers, pills, and magnetic strips: The fate of public education in America*. Charlotte, NC: Information Age.

Hage, J. (1965). An axiomatic theory of organizations. *Administrative Science Quarterly*, *10*(3), 289–320.

Hoy, W. K., & Ferguson, J. (1985). A theoretical framework and exploration of organizational effectiveness in schools. *Educational Administration Quarterly*, *21*(2), 117–134. doi:10.1177/0013161x85021002006.

Hoy, W. K., Tarter, C. J., & Bliss, J. R. (1990). Organizational climate, school health, and effectiveness: A comparative analysis. *Educational Administration Quarterly*, *26*(3), 260–279. doi:10.1177/0013161x90026003004

Hoy, W. K., Tarter, C. J., & Witkoskie (1992). Faculty trust in colleagues: Linking the principal with school effectiveness. *Journal of Research and Development in Education*, *26*(1), 38–44.

Lezotte, L. (2001). *Revolutionary and evolutionary: The effective schools movement.* Okemos, MI: Effective Schools Products.

Lipsey, M. W., & Wilson, D. B. (2001). *Practical meta-analysis.* Thousand Oaks, CA: Sage.

Miskel, C. G., McDonald, D., & Bloom, S. (1983). Structural and expectancy linkages within schools and organizational effectiveness. *Educational Administration Quarterly*, *19*(1), 49–82. doi: 10.1177/0013161x83019001004

Miskel, C. G., Fevurly, R., & Stewart, J. (1979). Organizational structures and processes, perceived school effectiveness, loyalty, and job satisfaction. *Educational Administration Quarterly*, *15*(3), 97–118. doi:10.1177/001313x7901500308

Mitchell, R. M., & Tarter, C. J. (2011). A systems approach to effectiveness in Catholic elementary schools: A replication and extension. *Journal of School Leadership*, *21*, 789–818.

Mott, P. E. (1972). *The characteristics of effective organizations.* New York, NY: Harper & Row.

Nichols, S. L., & Berliner, D. C. (2007). *Collateral damage*. Cambridge, MA: Harvard Education Press.

Rosenthal, R. (1991). *Meta-analytic procedures for social research* (Revised ed.). Thousand Oaks, CA: Sage.

Rosenthal, R., & DiMatteo, M. R. (2001). Meta-Analysis: Recent developments in quantitative methods for literature reviews. *Annual Review of Psychology*, *52*(1), 59–82. doi:10-1146/annurev.psych.52.1.59

Steers, R. M. (1975). Problems in the measurement of organization effectiveness. *Administrative Science Quarterly 20*(4), 546–558.

Sweetland, S. R., & Hoy, W. K. (2000). School characteristics and educational outcomes: Toward an organizational model of student achievement in middle schools. *Educational Administration Quarterly*, *36*(5), 703–729. doi:10.1177/00131610021969173

Tarter, C. J., & Hoy, W. K. (2004). A systems approach to quality in elementary schools: A theoretical and empirical analysis. *Journal of Educational Administration*, *42*(5), 539–554. doi:10.1108/09578230410554052

Tarter, C. J., Sabo, D., & Hoy, W. K. (1995). Middle school climate, faculty trust, and effectiveness: A path analysis. *Journal of Research and Development in Education*, *29*(1), 41–49.

Uline, C. L., Miller, D. M., & Tschannen-Moran, M. (1998). School effectiveness: The underlying dimensions. *Educational Administration Quarterly*, *34*(4), 462–483. doi:10.1177/0013161x98034004002

CHAPTER 10

ALL FOR ONE AND ONE FOR ALL

A Social Network Perspective on the Effects of Social Influence on Teacher Trust

Dimitri Van Maele, Nienke M. Moolenaar, and Alan J. Daly

ABSTRACT

Trust is an important ingredient of school climates that are conducive to learning. The mechanisms affecting trust perceptions are not often explored, however. In this chapter we examine the ways in which direct relations with peers may influence the perception of trust. We investigate the extent to which teachers' trust is related to both faculty trust and the trust present in a teacher's "peer neighborhood" at school. Social network and multilevel analysis, using data from 645 educators in 37 Dutch elementary schools, demonstrate that the trust from close peers and the number of peers sought out to discuss work affect individual trust, even when controlling for faculty trust. This suggests that school leaders and professionalization programs should focus not only on providing structural opportunities for teachers to

Leadership and School Quality, pp. 171–196

interact, but also on the quality of exchanges at both the school level and the level of a teacher's individual social network.

Educators have been looking for ways to improve student outcomes for many years. Many approaches to reform practices call for the introduction of innovative opportunities across aspects of social and physical infrastructure. One commonly identified solution is an emphasis on collaborative professional interactions among and between school members, through opportunities to learn together (Schechter & Atarchi, 2014). Learning from colleagues through social interaction holds the potential to identify patterns of practices and consciously reflect on the improvement of these practices, which may in turn gradually advance professional knowledge (Schechter, Sykes, & Rosenfeld, 2008). In an effort to foster a collaborative norm of interactions and break down teacher isolation (Collinson & Cook, 2004), there has been increasing interest around restructuring teachers' work environments into collaborative communities of practice, particularly in elementary school settings (Little, 1990; Louis, Marks, & Kruse, 1996; McLaughlin & Talbert, 2001). One of the most often identified ingredients to successful collaboration is trust.

Trust among teachers has been called the backbone of a strong and sustainable professional learning community (Hargreaves, 2007). The ability to be vulnerable and take risks in a safe environment is critical to learning and the development of community (Bryk & Schneider, 2002; Tschannen-Moran, 2009; Van Maele, Forsyth, & Van Houtte, 2014). However, despite its well-documented positive effects, we have limited knowledge about the antecedents of individual teachers' trust in their colleagues. Such antecedents may be found in both relational social capital (e.g., the overall levels of trust in schools) and structural social capital (e.g., the relationships among teachers in school social networks) (Moolenaar & Sleegers, 2010; Moolenaar, Sleegers, Karsten, & Zijlstra, 2009). Although one may argue that the influence of directly-connected peers may equally impact trust levels, this social capital is often studied at the collective level. In this chapter, we address this issue by examining the extent to which faculty and peer level trust (as relational social capital) affect individual teachers' trust in colleagues. Moreover, we examine the degree to which characteristics of teachers' social network (as structural social capital) affect this relationship between faculty, peer, and individual trust.

Based on social network and multilevel analysis, we will empirically test whether there is a positive and significant effect on the trust contained within a faculty member's peer neighborhood at school on the trust perceptions of that individual, accounting for school level trust and network effects. By peer neighborhood, we mean those peers with whom a focal

teacher has direct social ties within a school. In also taking into account the role of the structure of networks at the level of the individual teacher, our study sheds light on the way that both structural and relational social capital are conducive to the development of a faculty member's trust in colleagues. In this way we provide a more fine-grained and nuanced assessment of the antecedents of individual trust than has been offered in previous literature. As such, we add empirical evidence to those processes that provide a crucial ingredient of professional learning in school.

Theoretical Framework

When reflecting on teaching, most people will probably recall the image of the single teacher standing in front of a group of students in the classroom. This prevalent image describes the work of the teacher as characterized by a significant amount of isolation and autonomy. After all, teachers prepare their own courses, decide how to deliver material, govern the pace of lessons, manage classroom discipline, all of which suggests the lone individual charting and executing the course of instruction. This picture of the isolated and autonomous teacher within the setting of the school organization has been widespread within the educational literature since Lortie (1975) published his classical work *School teacher: A sociological study* (Lortie, 2002). Autonomy is indeed a typical aspect of the teaching job, but to be successful in accomplishing teaching goals within the social system of the school, teachers are to a large extent dependent on their interactions with other school actors (Hedges & Schneider, 2005; Little, 1990). Relationships with teaching colleagues, for example, fulfill a crucial role in exchanging and improving teachers' knowledge, practice, and professional learning (Nias, 2005).

Teaching and teachers' learning is not a solitary activity, but takes place within the social system of the school organization. Scholars have investigated how the nature of teachers' social relationships in the workplace relates to their job attitudes and behaviors, such as their commitment to work (Louis, 1998), their involvement and learning in professional communities (Bryk, Camburn, & Louis, 1999), and their motivation to leave the profession (Skaalvik & Skaalvik, 2011). A growing body of educational research has identified trust as key (see Bryk & Schneider, 2002; Forsyth, Adams, & Hoy, 2011; Price, 2012; Tschannen-Moran, 2014; Van Maele et al., 2014). In line with organizational studies, which indicate that trust among coworkers fosters the effectiveness of organizations and their members (Costa, 2003; Dirks & Ferrin, 2001), the educational literature has demonstrated the importance of collegial trust relationships for teachers' collective efficacy (Forsyth, Barnes, & Adams, 2006); job satisfaction (Van Maele & Van Houtte, 2012);

burnout (Van Maele & Van Houtte, forthcoming); intention to continue teaching (Addi-Raccah, 2012); collaborative, professional, and innovative orientations and practices (Moolenaar & Sleegers, 2010; Tschannen-Moran, 2009; Tschannen-Moran & Hoy, 2001); and the exchange of best practices between leaders (Daly & Finnigan, 2012). In highlighting the interplay between social interactions and trust, we will draw on two distinct but overlapping bodies of work: social capital and trust.

Social Networks and Social Capital

Social capital theory may provide insight into how the social processes involved in teacher communities are often stretched across individuals and levels of the educational system and affect perceptions of trust. Generally speaking, social capital theory is concerned with the pattern of social ties that exists between actors in a social network (Scott, 2000). A social capital perspective entails a move from a primary focus on the individual and the attributes of that individual to understanding the more dynamic supports and constraints of the larger social infrastructure (Borgatti & Foster, 2003; Wellman & Berkowitz, 1998).

Social capital studies in education (e.g., Cole & Weinbaum, 2010; Daly, 2010; Frank, Zhao, Penuel, Ellefson, & Porter 2011; Levine & Marcus, 2010; Penuel, Riel, Krause, & Frank, 2009), as in other fields, primarily focus on how the pattern of relationships in networks may facilitate and constrain the flow of relational resources (e.g., attitudes, beliefs, knowledge, materials, etc.), as well as provide insight into how individuals gain access to, are influenced by, and leverage these resources (Degenne & Forsé, 1999). Social capital theorists focus on the influence and outcome of an actor's position vis–à-vis social ties with others (Borgatti & Ofem, 2010), such as teaching colleagues or the principal. In many cases, social network theorists suggest that the underlying social structure determines the type, access, and flow of resources to actors in the network (Newman, Barabasi, & Watts, 2006; Wasserman & Faust, 1994).

Social capital literature is concerned with both the network structure of social ties, thought of as the quantity of ties, and also the quality of those ties; for the sake of this chapter we will focus on the level of trust as an indicator of quality. The first element, network structure, is primarily focused on how an actor is embedded in social relations, which forms a patterned structure of relationships (Nahapiet & Ghoshal, 1998). One teacher, for example, might be embedded in advice-seeking relationships with almost all of his/her teaching colleagues, whereas another teacher might demonstrate such relationships with only a few of his/her colleagues. Social embeddedness refers to the nested nature of a social structure. In a social

network, individuals are embedded within dyadic relationships, and these pairs are embedded in larger subgroups of three, four, or more actors, that eventually form a social network. Social embeddedness also implies that changes at a single level (e.g., between pairs) will have consequences for a higher-order level (e.g., the network). In turn, the larger structure of the network influences an individual's ability to access resources (Scott, 2000). As such, the significance of a dyadic relation extends beyond the two actors into a larger network of relationships (Burt, 2000; Degenne & Forsé, 1999).

The role of networks has been implicated as both supports and constraints in educational processes (Daly, 2010; Daly, Liou, & Moolenaar, 2014; Kilduff & Krackhardt, 2008; Moolenaar, Karsten, Sleegers, & Daly 2014; Penuel et al., 2009). The structure of social networks may support work by facilitating the flow of information between individuals and overcoming the challenges of coordinating action (Adler & Kwon, 2002; Lin, 2001; Tsai & Ghoshal, 1998; Walker, Kogut, & Shan, 1997). In this study, we are particularly interested in one specific structural feature in the network: reciprocity.

A reciprocated relationship is one in which individuals have a symmetric or mutual social tie. Two teachers reaching out to one another to discuss instruction is an example of such a reciprocated relationship. Reciprocated relationships provide an opportunity for the mutual exchange of resources and the creation of norms between actors (Morrison, 2002). Collaborative interactions can support the exchange of information and knowledge by enabling reciprocated relationships, as is suggested in network studies of districts and teachers in elementary schools (Daly & Finnigan, 2010; Moolenaar, 2010). These mutual exchanges may provide opportunity for deeper exchanges, since these reciprocated ties have potential to become imbued with trust, value, and legitimacy (Honig & Ikemoto, 2008), and be valuable in the learning process. Reciprocated relationships may also support the transmission of tacit, non-routine, or complex knowledge (Hansen, 2002; Reagans & McEvily, 2003), or in joint problem solving and the development of coordinated and innovative solutions (Uzzi, 1997). All of these elements may be necessary for developing professional community (e.g., Datnow, Park, & Wohlstetter, 2007).

Cross (2001) suggested that even when individuals have ample amounts of available information they still tend to seek information from trusted colleagues rather than from those individuals who are recognized as experts. This suggests that unless the norms of trust and sharing are present, interactions may remain on a superficial, contrived collegiality level, rather than moving to in-depth exchanges (Little, 2007; Hargreaves, 1994) possible with reciprocated relationships. Further, when social ties are imbued with the quality of support, openness, and trust—all signals of reciprocity—educators are more likely to engage in joint collaborative work, exchange

complex tacit information, and support innovation (Daly, Moolenaar, Bolivar, & Burke, 2010; Moolenaar, Daly, & Sleegers, 2011; Young, 2008).

Many scholars have identified the structure of networks as closely linked to individual and collective advantage (e.g., Adler & Kwon, 2002; Nahapiet & Ghoshal, 1998; Walker et al., 1997), since those reciprocated social interactions provide opportunities to build trust and may add to the development of teacher community and learning. In this study, we define a teachers' peer neighborhood as those individuals with whom a teacher has a direct, reciprocated social tie, related to productive discussions regarding important work issues.

Trust

Trust among teachers has been called the backbone of strong and sustainable professional learning communities (Hargreaves, 2007). Through collegial trust, teacher learning in professional development programs should be enhanced, which in turn should be beneficial for student learning (Louis, 2006; Sahlberg, 2007). Improved student performance has been empirically related to trust among teachers (Bryk & Schneider, 2002; Forsyth et al., 2006; Leana & Pil, 2006). Trust among teachers forms the base for organizational school conditions that support the successful implementation of reform initiatives or policy measures (Cosner, 2009; Daly, 2009; Daly et al., 2010; Forsyth et al., 2011; Louis, 2007; Moolenaar, Daly, & Sleegers, 2011).

Trust is a complex and multidimensional concept (Cummings & Bromiley, 1996; Mishra, 1996) involving a condition in which people or groups find themselves vulnerable to others under conditions of risk, interdependence, and positive expectations (Rousseau, Sitkin, Burt, & Camerer, 1998). Following organizational trust literature, educational trust researchers have approached trust as an individual's or group's willingness to be vulnerable to another party in school, based on the confidence that the latter party is benevolent, reliable, competent, honest, and open (Daly & Chrispeels, 2008; Hoy & Tschannen-Moran, 2003; Forsyth et al., 2011; Van Maele & Van Houtte, 2011). Because collegial trust allows teachers to reveal themselves to one another in a vulnerable and open way, teacher learning within schools is fostered by the willingness to experiment with new ideas and practices (Bryk et al., 1999; Hargreaves, 2007; Tschannen-Moran, 2009). Trust equally supports teachers' willingness to risk vulnerability in dealing with reforms and innovations introduced at school (Cosner, 2009; Daly, 2009; Moolenaar & Sleegers, 2010).

Trust in educational settings is also an important component of improvement (Forsyth et al., 2011; Kochanek & Clifford, 2014; Van Maele

et al., 2014). Tschannen-Moran and Hoy (2000) suggest that, "Trust is pivotal in the effort to improve education. And yet, trust seems ever more difficult to achieve and maintain" (p. 5). Trust is an interactive process, with each party discerning the trustworthiness of the other (Bryk & Schneider, 2002; Tschannen-Moran, 2014). Moreover, trust is based on interpersonal interdependence (Rousseau et al., 1998) and is embedded in networks of relationships (Daly et al., 2014; Hoy & Tschannen-Moran, 2003; Moolenaar et al., 2014).

High levels of trust have also been associated with a variety of efforts that require collaboration, learning, complex information sharing and problem solving, shared decision-making, and coordinated action (Bryk & Schneider, 2002; Daly et al., 2014; Hallam, Dulaney, Hite, & Smith 2014; Moolenaar & Sleegers, 2010; Tschannen-Moran, 2014; Lin, 2001). Trust may also be important for the development of open, collaborative, and learning-oriented climates, which may, in turn, increase the quality of individual and organizational outcomes (Goddard, Tschannen-Moran, & Hoy, 2001; Moolenaar, Daly, & Sleegers, 2010; Tschannen-Moran, 2014). Therefore, creating and supporting a climate of trust may increase opportunities for exchanging information critical to discussing and improving practice.

Much of the extant literature about the antecedents of teachers' trust in colleagues is situated at the level of the individual and the school (Moolenaar & Sleegers, 2010; Smith, Hoy, & Sweetland, 2001; Van Maele & Van Houtte, 2009, 2011). Recently, individual and collective social network characteristics of teachers have been indicated as predictive of trust in colleagues (Daly & Finnigan, 2012; Moolenaar & Sleegers, 2010; Moolenaar et al., 2011; Moolenaar et al., 2014). However, the peer social influences of trust are rarely examined in the trust literature. Linking the characteristics of a teachers' peer neighborhood with the formation of collegial trust provides a microlevel examination of potentially important influence phenomena on the perception of trust. In addition, this peer-level influence may suggest an additional mechanism through which we might understand how trust is formed.

Social Influence, Faculty Trust, and Peer Trust

From a social influence process perspective (Salancik & Pfeffer, 1978), trust in colleagues is likely to be fostered in a trusting work environment. When surrounded by colleagues who trust one another, a teacher may be more likely to develop trust in his/her colleagues. This process can be framed as *spillover effects* (Jackson & Bruegmann, 2009; Penuel, Sun, Frank, & Gallagher, 2012), indicating that shared contexts and network ties may

influence people to develop similar attitudes, beliefs, and behaviors as held by others in their social context or network.

At the microdyadic level, trust in colleagues may be a result of teacher's repeated interactions with colleagues. At the meso-level of the faculty, trust is likely to become a collective phenomenon due to social information or influence processes among the group members (Salancik & Pfeffer, 1978; Shamir & Lapidot, 2003). The attention of group members gets structured in such a way that particular aspects of the organizational environment, such as a collaborative culture, become more or less salient; (in)direct communication among them additionally provides constructed meanings that include evaluations of objects, events, or other persons. These social information processes may result in a shared interpretation of the environment among group members regarding, for example, the trustworthiness of colleagues. Research has already paid extensive attention to the level of collegial trust characterizing a school's faculty (Hoy & Tschannen-Moran, 2003; Forsyth et al., 2011). Shared perceptions of trust at a school level reflect the collective characteristic of a faculty, referred to as *faculty trust*.

Just as social influence processes can result in the development of collective trust, the same processes could hold true when investigating the role of a trusting social context at work in the formation of individual trust in colleagues. Teaching in a school in which faculty members tend to trust one another may encourage teachers to trust their colleagues as well. We may, therefore, expect the level of faculty trust in a school to influence perceptions at the individual level (cf. Burt & Knez, 1995; Jackson & Bruegmann, 2009; Shamir & Lapidot, 2003).

Educational research has typically neglected to examine trust as a collective characteristic that exists within faculty members' dyadic interactions within a larger social network in schools. Based on network theory, we argue that the colleagues included in an individual's peer neighborhood, as a group, can be distinguished as unique and potentially influential on the perception of trust. As such, trust can be addressed as a collective characteristic of the peers within a faculty member's network at school, as compared to a collective trait of the faculty. We therefore introduce the concept of *peer trust*, which is the level of collective trust in another individual or group present among the peers included in an individual's social network.

Beyond the meso-network level effect of faculty trust, we argue that peers with whom a teacher has a direct relationship (i.e., the microdyadic level) could also be influential on perceptions. When the level of peer trust in colleagues is high, the focal faculty member may be expected to develop a similar perception of trust in his or her colleagues. From a social influence perspective, both faculty and peer trust in colleagues can thus be expected to spillover to the focal faculty member.

Although a teacher is embedded in a broader network of relations in a school, s/he is not necessarily directly tied to all other members of the school faculty. Therefore, although research has suggested this meso-level network has influence on perceptions, it is likely the case that those with whom a teacher has a direct tie may influence individual perceptions. However, it remains an open question as to whether peers directly connected to a focal faculty member's network exert an independent influence on that teacher's attitudes, beliefs, and behaviors beyond a meso-level network effect.

To shed light on this important question, we analyze how both faculty and peer trust in colleagues relate to a faculty member's trust in colleagues. This piece makes a unique contribution by determining whether the level of collegial trust present within faculty members' peer neighborhood, described as peer trust, relates to the individual's own level of trust in colleagues. Finally, we investigate whether the level of collegial trust present at the level of a school's faculty, referred to as faculty trust (Forsyth et al., 2011; Van Maele & Van Houtte, 2009), affects individual trust in colleagues next to a possible effect of peer trust. In doing this, we account for structural characteristics of the teachers' network at school. This work is unique in analyzing outcomes at the individual faculty member level because it accounts for the impact of the structural and relational dimension of individuals' social networks. The study thus combines the structural (i.e., number of ties and reciprocated relations) and relational (i.e., trust) elements of network theory in understanding antecedents of trust. In setting these research goals, this article particularly sheds light on the role the peers and faculty members in general exert with respect to the nature of trust in schools.

METHOD

Data Collection

Context. Our survey study took place in the south of the Netherlands, in 2006, at 37 elementary schools. The schools resided under a single school board, which coordinated collective resources such as financial, IT, and personnel support. The sample schools were selected as the district had initiated a district-wide ongoing school and teacher monitoring process around school improvement. The schools are relatively small compared to average U.S. elementary schools. The student population in the schools was rather reflective of the average Dutch student population in regard to SES and ethnicity (see Moolenaar, 2010).

Sample. Data for this study were included in which we had at least 10 valid and complete survey responses. The number of faculty in the

sample schools varied between 11 and 37 (M = 20.3, SD = 6.4). We had a total sample size of 609 teachers and 36 principals (N = 645), reflecting a response rate of 85.7%. Of the respondents, 72.9% were female, which is generally reflective of the gender ratio in Dutch elementary education across the country. Of the respondents, 53.5% worked full-time (32 hours or more) and 51.3% were 50 years or older. All respondents had been working at the school for at least 6 months and the school teams were functioning in the same team composition for at least 6 months, with the majority of teams (87.2%) having at least 2 years of shared experience. As such, individual judgments about their colleagues' trustworthiness may be thought to be more stable. Additional sample demographics are presented in Table 10.1.

Table 10.1 Sample Demographics (N =)

Characteristics	*n*
Gender	
Female	72.9 %
Age (years)	
21–30	14.2 %
31–40	14.9 %
41–50	24.4 %
51–60	44.6 %
> 60	1.9 %

Instruments

Social network measures. To systematically study patterns of social relationships among educators in school teams, we employed social network analysis. Social network analysis is a method to systematically study the patterns of relationships among individuals to understand how they are embedded in a larger social structure (e.g., Moolenaar, 2012). Based on organizational studies on social networks and innovation (e.g., Copeland, Reynolds & Burton, 2008), we measured discussing work relationships to examine social networks. In the survey, respondents were asked to identify the individuals to whom they turn to *productively discuss their work* described by the social network question. To delineate the social networks of the faculty in the schools, we asked each faculty member to answer to the question, "Whom do you turn to in order to discuss your work?" (Flap & Völker,

2001). The survey was accompanied by a school specific appendix, in which the names of all faculty members were represented by a letter combination (e.g., Mrs. Julia High = AB). Respondents could indicate a relationship by answering the letter combination of the intended colleague(s); they could name as many colleagues as they wanted (i.e., free choice).

Using the social network data, we calculated social network measures at the individual level (i.e., ego network) (cf. Borgatti, Jones, & Everett, 1998; Burt, 1983). As indicators of an individual's social network, we included *in-degree* and *out-degree* to represent the number of peers that a faculty member has strong work-related relationships with. These were calculated and analyzed by means of UCINET 6.0 (Borgatti, Everett, & Freeman, 2002). Moreover, all predictors were standardized to facilitate interpretation of the multilevel models. We will now describe these network characteristics in detail.

Out-degree. Out-degree indicators refer to the number of people with whom the faculty member indicated s/he discusses work. In other words, a respondent will have a high out-degree, if s/he indicates turning to many different colleagues in the school team to discuss work. As such, out-degree can be interpreted as an indicator of relational activity.

In-degree. In-degree indicators refer to the number of people by whom the respondent is chosen. A respondent will have a high in-degree, if s/he is chosen by many different colleagues as a person with whom they discuss work. In-degree can therefore be interpreted as an indication of an individual's popularity. Both out-degree and in-degree are calculated relative to the faculty network size to make the measures comparable across schools.

Individual trust in colleagues (ITC). We measured the dependent variable, individual trust, using a Dutch translation of the "trust in colleagues" scale (Hoy & Tschannen-Moran, 2003). The items were scored on a four-point scale, ranging from 1 (*strongly disagree*) to 4 (*strongly agree*). The scale for trust was composed of nine items (e.g., "Even in difficult situations, I can depend on my colleagues" [$\alpha = .90$]). Principal component analysis confirmed that the nine items loaded highly on a single factor that explained 55.8% of the variance. Scale scores were composed using the mean score of all trust items. The items and factor loadings of this principal component analysis are presented in Table 10.2. ITC had a mean of 3.33 ($SD = .50$, $N = 626$).

Faculty trust in colleagues (FTC). We calculated this variable as the mean of the individual trust scores of all faculty members. To ensure allowance for aggregation of individual trust scores to the school level (see Van Maele & Van Houtte, 2009), we calculated the mean rater reliability based on the intraclass correlation coefficient from a one-way analysis of variance (see Glick, 1985). The intraclass correlation coefficient for FTC was 0.68, exceeding the threshold of 0.60, thus permitting aggregation to the

Table 10.2. Items and Factor Loadings of the Trust Scale (*N* = 645)

Trust (α= .90)		*Factor I*
1.	Even in difficult situations, I can depend on my coworkers	.850
2.	I can always count on my colleagues	.840
3.	I find that my coworkers are open to me	.805
4.	I trust my coworkers	.790
5.	I find that my coworkers are honest to me	.771
6.	I really care about my colleagues	.696
7.	I share personal information with my coworkers	.677
8.	I find that my colleagues don't really care for me (recoded)	.653
9.	I distrust my colleagues (recoded)	.597

group level (Glick, 1985). The *F*-value for teachers' trust scores was 3.170 ($p \leq .001$), indicating a significant difference in mean trust scores across the schools. Faculty trust had a mean of 3.32 ($SD = 0.20$, $N = 37$). We also captured the variation in trust scores among all faculty members by calculating the standard deviation of their individual trust scores (see Harrison & Klein, 2007). We labeled this variable as faculty trust distribution (FTD) ($M = 0.48$, $SD = 0.12$, $N = 37$).

It is important to note that the measurement of FTC and FTD are in part related to our dependent variable, ITC, since the measures of faculty trust per school are calculated as the mean of all individual trust scores per school (see Table 10.4). However, since the smallest school team consisted of 11 members, this means that the ITC scale only contributes to the FTC and FTD scales for a maximum of 9.1%.

Peer trust in colleagues (PTC). We assessed peer trust as the mean of the trust scores among a faculty member's peers in his/her reciprocal direct tie network. For each focal individual, we first examined which peers s/he had a reciprocal relationship with, using the social network data. This means that based on the original network data, which included directed relationships between individuals, the direction of the ties was important. We created networks containing only reciprocal relationships to identify only the peers with whom individuals have strong reciprocal relationships. As such, our interpretation of the peer neighborhood of teachers is a relatively strict interpretation, with peers being considered only those colleagues with whom someone has a strong reciprocal relationship regarding discussing work. We then used the ITC measure of each of these peers to calculate the average PTC of the focal individual. This measure reflects the trust of the peers surrounding the focal individual. PTC is a measure based on the composite score of a teacher's peers' individual trust scores,

but needs to be regarded as an individual teacher characteristic ($M = 3.00$, $SD = 1.13$, $N = 643$). PTC has a normal distribution, but because some of the respondents do not have reciprocal peers, their peer-trust score is 0 (no influence by peers)—this makes the overall distribution nonzero. Therefore, we included the variation in the trust scores of the peers as a variable by calculating the standard deviation of their trust scores (see Harrison & Klein, 2007). This variable has been labeled peer trust distribution (PTD).

Descriptive statistics of the relational and structural characteristics of the networks under study are presented in Table 10.3.

Table 10.3. Descriptive Statistics of the Study Variables at the Individual and School Level ($N_{schools} = 37$, $N_{educators} = 645$)

	M	*SD*	*Min.*	*Max.*
Individual level				
Trust				
Individual trust	3.33	0.50	1.44	4.00
Peer trust	3.00	1.13	0.00	4.00
Peer trust distribution	0.28	0.24	0.00	1.10
Network characteristics				
Out-degree	0.34	0.24	0.00	1.00
In-degree	0.34	0.20	0.00	1.00
School level				
Trust				
Faculty trust	3.32	0.20	2.87	3.75
Faculty trust distribution	0.48	0.12	0.30	0.80

Demographic variables. We collected demographic variables to assess the presence of any relationships among respondents' background demographics, social network characteristics, and trust. We controlled for the faculty members' age and gender. Of the sample, 73% of the faculty members were female. With respect to age, the average age of the faculty members was 45.93 ($SD = 10.81$). The youngest respondent was 21 years old; the oldest, 62.

Data Analysis

To account for the nested structure of our data (faculty members in schools), we used multilevel analysis (HLM) to examine our research

Table 10.4. Correlations Among the Study Variables (N = 645)

	1a	1b	1c	2a	2b	3
1a. Individual trust	1	.22**	.03	.25**	.13**	.40**
1b. Peer trust (*mean*)		1	.35**	.38**	.28**	.16**
1c. Peer trust (*standard deviation*)			1	.30**	.24**	–.15**
2a. Out-degree				1	.34**	.05
2b. In-degree					1	.06
3. Faculty trust #						1

Disaggregated and included at individual level for correlation purposes only.

questions. Several multilevel analyses were analyzed. Our initial model is a random intercept model in which the variance of the dependent variable *individual trust* is decomposed into an individual level component and a school level component. We then included significant individual level demographic variables and the PTC variables to the model to examine the influence of PTC on individual trust (Table 10.5, Model 1). Next, we tested whether individual level structural network measures affected the extent to which ITC was influenced by the level of PTC (Table 10.5, Model 2). Then, we added FTC and FTD (Table 10.5, Model 3) to test whether faculty trust contributed to the prediction of individual trust, next to a possible influence of peer trust, and the social network characteristics of individual faculty members and their demographics. In this way, we were able to test whether between-school relationships differed from within-school relationships between social network characteristics and trust.

RESULTS

The unconditional multilevel model, that is, the model excluding any independent variables at the individual and school level, showed that 11.4% of the variation in individual trust in colleagues is explained at the school level ($[\tau_0 / \tau_0 + \sigma^2]$, with $\sigma^2 = 0.220$; $\tau = 0.028$; $p \leq 0.001$; $N = 626$), and 88.6% at the individual level. Next, we added gender and age to the model (not presented). Gender (male = 0, female = 1) held a positive and significant association with ITC (standardized gamma coefficient $y^* = .101$, $p < .01$).

Next, we added both the mean and standard deviation of peer trust to the model including age and gender (see Model 1, Table 10.5). The standard deviation of peer trust, reflecting the variation of trust in colleagues

Table 10.5. Multilevel Analysis of the Influence of Peer Trust, Faculty Trust, and Social Network Characteristics On Individual Trust

	Model 1	*Model 2*	*Model 3*
Individual level			
Gender (female)	.092**	.084**	.079*
Age	.020	.023	.022
Peer trust	.248***	.157*	.138*
Peer trust distribution	.039	–.036	.006
Out-degree		.261***	.214***
In-degree		.097*	.033
School level			
Faculty trust			.360***
Faculty trust distribution			–.035
Variance component			
Intercept U0	0.02*	0.02	0.00
Age U2	0.00	0.00	0.00
Peer trust (*mean*) U3	0.02***	0.02*	0.02*
Peer trust (*standard deviation*) U4	0.07	0.08	0.03
Out-degree U5		0.07	0.04
In-degree U6		0.10	0.08

Notes: Presented are the standardized gamma coefficients (γ^*). Total explained variance at school level is 11.4 %. Total explained variance at the teacher level is 88.6%. Unconditional model $\chi 2 = 114.38$ ($p < .001$); Model including gender and age (not reported) compared to the unconditional model: $\chi^2_{\text{Diff.}}(5) = 9.24$ ($p > .05$);
*** $p \leq .001$; ** $p < .01$; * $p < .05$.

among a faculty member's peers, PTD, was not significantly related to ITC ($p > .05$). In contrast, mean peer trust, reflecting the extent to which an individual's close peers trust their colleagues, was significantly related to an individual teacher's level of trust ($\gamma^* = .248$, $p \leq .001$). In other words, the more an individual was surrounded by high-trusting peers with whom s/he had a strong work relationship, the higher her/his individual trust in colleagues, indicating a relatively strong, positive association between peer and individual trust in colleagues.

In Model 2 we include the structural characteristics of one's individual social network, out-degree, and in-degree (see Table 10.5). These structural characteristics of someone's social network had an independent influence

on his/her trust in colleagues. Out-degree was positively associated with trust in colleagues ($y^* = .261, p \leq .001$), whereas in-degree demonstrated a positive and significant, but less determining, association with the outcome ($y^* = .097, p < .05$). As such, the results presented in Model 2 suggest that both the structural (i.e., network characteristics) and relational (i.e., level of peer trust) dimension of a faculty member's social network in school affect his/her level of trust in colleagues.

In Model 3, school-level relational characteristics of the faculty's social network were added to the model (see Table 10.5). The findings indicated that the average level of trust among all faculty members (i.e., faculty trust) significantly and positively related to an individual faculty member's level of trust in colleagues ($y^* = .360, p \leq .001$). A significant association between individual trust in colleagues and the variation in trust scores among all faculty members (i.e., FTD), was not assessed. In this model the influence on the outcome of both peer trust and out-degree remained significant. This demonstrates that both structural network characteristics (i.e., number of relationships as mentioned by the teacher) as well as relational network characteristics (i.e., level of peer trust) are significantly related to teachers' perceptions of trust in colleagues, above and beyond the influence of faculty level trust.

DISCUSSION

Making use of social network analysis, this study explored whether both structural and relational social capital influenced a teacher's individual perception of collegial trust. We focused on an understudied aspect of trust—the antecedents of individual trust in colleagues. This work is motivated by the idea that trust is an important ingredient of successful collaboration within professional communities of learning (Hargreaves, 2007; Tschannen-Moran, 2009). Collegial trust may increase opportunities to exchange information, which is critical to discussing and improving teachers' learning and practice. Moreover, it supports teachers' willingness to risk vulnerability in dealing with reforms and innovations introduced at school (Cosner, 2009; Daly, 2009; Moolenaar & Sleegers, 2010).

Our findings indicate that the structural (i.e., number of outgoing relationships) and relational characteristics (i.e., level of peer trust) of an individual's social network significantly predict individual perceptions of trust. Moreover, our results suggest that these relationships hold, even when controlling for overall levels of faculty trust, demographics, and other network features (i.e., distribution of trust perceptions). Our analyses therefore suggest three main findings. First, when a teacher is surrounded by peers who trust their colleagues, s/he is more likely to trust his/her col-

leagues. Second, the more colleagues a teacher seeks out to discuss work, the more a teacher trusts his/her colleagues. Third, the level of faculty trust positively influences individual trust in colleagues above and beyond the influence of peer trust and seeking behavior. In reflecting on these results, we would like to highlight three main takeaways.

The Role of Peers

An individual teacher's level of trust is in part related to the level of trust of the peers with whom they have a mutual and direct work related tie. As such, the higher a teacher's peer level trust is, the higher his/her individual trust in colleagues will be. This suggests that perceptions of trust are socially influenced, and that trust spreads through direct relationships with peers. However, there may be other social mechanisms through which perceiving trust may be affected. For instance, as we have argued, a teacher may perceive higher trust because his/her peers display trustworthy behavior (i.e., social influence) (e.g., Salancik & Pfeffer, 1978). But collegial trust may equally develop because a teacher's peers confirm high levels of trust in the organization (i.e., social persuasion) (e.g., Bandura, 1986), or because a teacher who has a high tendency to trust selects peers who themselves also perceive high levels of trust in colleagues (i.e., social selection) (e.g., Robins, Elliott, & Pattison, 2001). Further research into these peer effects will have to explore such mechanisms through longitudinal and qualitative research in order to advance our knowledge on the origin of these peer effects. Whatever the mechanism, an important message for those involved in school leadership and teacher professionalization is that peers, particularly those with whom a teacher has a direct tie, play a substantial role in the perceived level of trust a teacher has in his/her colleagues. This point is particularly salient as the work of teachers moves from climates of isolation to cultures of collaboration in which ties to peers are critical.

The Added Value of Having Work-Related Relationships

The more teachers reach out to others to engage in work relationships, the higher their level of trust in colleagues. This higher level of trust remains even when accounting for the level of peer trust. The level of peer trust and the number of peers with whom work is discussed, therefore, have a complementary effect on individual trust. Teachers who experience high levels of peer trust through their relationships with *more* ties to colleagues will, on average, perceive higher levels of trust than teachers who experience high levels of peer trust, but only with *fewer* numbers of work

relationships. This seems to suggest that relationships with multiple high-trusting peers offer some kind of confirming effect on individual teachers' levels of trust. In other words, perceiving trust may not only be socially influenced, but also affected by a confirmation of this social influence in many other peers.

Another important idea of this work is the idea of reaching out to colleagues. Often in schools there is a concern with seeking out and identifying experts, implying that incoming ties to experts are important and this is certainly the case. However, the idea that reaching out to others is valuable is an equally important part of the interactional process. Schools whose faculty both seek and are sought out by others regarding productive work relations may be more likely to share practice as well as trust. Providing opportunities for teachers to be both a sink and source of productive work knowledge seems critical. Our work also suggests that reciprocated ties are important. Therefore, providing opportunities and conditions for teachers to share openly is essential. Reciprocated ties related to productive work exchanges provide the opportunity to develop shared norms and practices, which can support both practices and perceptions.

Attending to Trust at Both a Local and Global Level

Finally, our results suggest that faculty trust predicts individual trust, peer trust, and the number of colleagues with whom work is discussed. To date, much of the trust literature has argued the influence of overall faculty trust, which can be conceptualized as a global meso-level property of the schools, belonging to no one individual and reflecting all teachers. The work on faculty trust offers significant contributions to our understanding of numerous educational processes as well as how a generally trusting school climate can be consequential to a variety of important educational outcomes, not the least of which is student and teacher learning (Forsyth et al., 2011; Van Maele et al., 2014). Our work continues that tradition, finding that overall trust is indeed an important factor in understanding an individual's perception of trust. It is important to continue attending to and investigating the antecedents and consequences of this global property of a school.

Local microdyadic interactions, defined by direct and reciprocated ties to others, are also significantly influential on perceptions of trust, even when controlling for overall faculty trust. This finding indicates that leaders and educators must attend to the overall climates of schools as well as those microlevel interactions, which are salient to the development of perceptions. This is an important idea and can be thought of as a glocal approach to perceptions of trust—that is, one in which there is a

dual focus on global climates as well as local interactions. Researchers and practitioners will have to attend not only to overall school climate issues, but also to the more micro-level, local interactions through which levels of trust are often defined.

Limitations

Although we see the potential in this line of work to add to our conceptual understanding of trust at multiple levels, we also acknowledge limitations to this study. First, our measurement of trust warrants further investigation. The scale of faculty trust at the school level inevitably incorporated the individual trust scores of all team members of the school. Similarly, the peer trust scores are calculated based on individual trust scores and, in some combination, also contributed to the faculty trust score. In other words, the trust scores at all levels cannot be considered to be independent, and therefore there is the potential danger of multicollinearity (at a methodological level) and conceptual overlap (at the theoretical level). At the conceptual level, this resembles the discussion on multilevel homology (e.g., Chen & Bliese, 2002) about the (dis)similarity of the concepts self-efficacy and collective efficacy at multiple levels of analysis (e.g., averaged team-level self-efficacy does not conceptually equate to average collective efficacy). Within the trust literature, this discussion seems to be largely overlooked (cf. Moolenaar et al., 2009). This gap in the literature calls for extensive empirical research on multilevel homology of trust, to understand its meaning and its measurement at multiple levels of analysis.

Second, the network relationships used in this study are based on relationships characterized by discussing work. It remains a question, therefore, whether a different way of conceptualizing these networks (such as by relationships characterized by advice giving/seeking or helping behavior) would alter our findings. Another network conceptualization will result in another constellation of the peer neighborhood and another level of peer trust, just as it will alter the number of incoming and outgoing relationships of teachers. Different ways of conceptualizing the network might lead to differential associations between structural and relational network characteristics and a teacher's level of collegial trust.

Implications

Our work mainly contributes theoretically and methodologically to the field of educational research. Our findings might also have consequences for the real world of school organizations, and, more in particular, for the

paths to follow in order to stimulate teacher learning and professionalization. The contribution of this work is in highlighting the importance of peer influence, defined in this study as the influence of the peers with whom a teacher actually interacts, as an important antecedent to the perception of collegial trust. In addition, this study suggests a more nuanced understanding of the influence of trust, moving from a global influencing effect of school climate to recognizing the powerful influence of local interactions on perceptions of trust. Professional development programs might become more effective when they not only focus on changing practices, attitudes, and beliefs within the faculty as a whole, but also among teachers within small groups, such as those with whom teachers collaborate, discuss work, and share important, productive work practices.

Furthermore, school leaders should attend to the structure of the ties among their teachers, providing opportunities for connections to be made, sustained, and reciprocated. Providing teachers opportunities and incentives to reach out to their colleagues may have multiple benefits beyond simply sharing practices. Creating the conditions for teachers to engage in work-related relationships with their colleagues may result in an increased perception of collegial trust, which is associated with a host of positive outcomes.

Attention is needed not only to the structural opportunities to interact, but also the quality of those exchanges. Merely attending to the number of ties (e.g., providing the opportunity, time, and structure to collaborate) is a necessary, but not sufficient, condition for productively sharing work. In order for that deeper level of exchange to happen, attention needs to be paid to the overall quality of relationships (as exhibited by faculty trust), as well as to the quality of exchanges of a teacher with his/her direct peers in school (as exhibited by peer trust). The need to simultaneously attend to the quality of social relationships at both the global and local level is an important message for school leaders and practitioners of professionalization.

REFERENCES

Addi-Raccah, A. (2012). Teachers' trust in role partners, intention to continue in teaching, and schools social composition in Israel. *Urban Education, 47*, 835–864.

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

Bandura, A. (1986). *Social foundations for thought and action: A social cognitive theory.* Englewood Cliffs, NJ: Prentice-Hall.

Borgatti, S. P., Everett, M. G., & Freeman, L. C. (2002). *UNICT for windows: Software for social network analysis*. Harvard, MA: Analytic Technologies.

Borgatti, S. P., & Foster, P. (2003). The network paradigm in organizational research: A review and typology. *Journal of Management, 29*, 991–1013.

Borgatti, S. P., Jones, C., & Everett, M. G. (1998). Network measures of social capital. *Connections, 21*, 27–36.

Borgatti, S. P., & Ofem, B. (2010). Overview: Social network theory and analysis. In A. J. Daly (Ed.), *Social network theory and educational change* (pp. 17–29). Cambridge, MA: Harvard Education Press.

Bryk, A. S., Camburn, E., & Louis, K. S. (1999). Professional community in Chicago elementary schools: Facilitating factors and organizational consequences. *Educational Administration Quarterly, 35*, 751–781.

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

Burt, R. S. (1983). Range. In R. S. Burt & M. J. Minor (Eds.), *Applied network analysis: A methodological introduction* (pp. 176–194). Beverly Hills, CA: Sage.

Burt, R. S. (2000). The network structure of social capital. *Research in Organizational Behavior, 22*, 345–423.

Burt, R. S., & Knez, M. (1995). Kinds of third-party effects on trust. *Rationality and Society, 7*, 255–292.

Chen, G., & Bliese, P. D. (2002). The role of different levels of leadership in predicting self and collective efficacy: Evidence for discontinuity *Journal of Applied Psychology, 87*, 549–556.

Cole, R. P., & Weinbaum, E. H. (2010). Changes in attitude: Peer influence in high school reform. In A. J. Daly (Ed.), *Social network theory and educational change* (pp. 77–96). Cambridge, MA: Harvard University Press.

Collinson, V., & Cook, T. F. (2004). Learning to share, sharing to learn: Fostering organizational learning through teachers' dissemination of knowledge. *Journal of Educational Administration*, *42*, 312–332.

Copeland, M. P., Reynolds, J. K., & Burton, J. B. (2008). Social identity, status characteristics and social networks: Predictors of advice seeking in a manufacturing facility. *Asian Journal of Social Psychology, 11*, 75–87.

Cosner, S. (2009). Building organizational capacity through trust. *Educational Administration Quarterly, 45*, 248–291.

Costa, A. C. (2003). Work team trust and effectiveness. *Personnel Review, 32,* 605–622.

Cummings, L. L., & Bromiley, P. (1996). The organizational trust inventory (OTI): Development and validation. In R. M. Kramer & T. Tyler (Eds.), *Trust in organizations* (pp. 302–330). Thousand Oaks, CA: Sage.

Daly, A. J. (2009). Rigid response in an age of accountability: The potential of leadership and trust. *Educational Administration Quarterly, 45*, 168–216.

Daly, A. J. (Ed.). (2010). *Social network theory and educational change*. Cambridge, MA: Harvard University Press.

Daly, A. J., & Chrispeels, J. (2008). A question of trust: Predictive conditions for adaptive and technical leadership in educational contexts. *Leadership and Policy in Schools, 7*, 30–63.

Daly, A. J., & Finnigan, K. (2010). A bridge between worlds: Understanding network structure to understand change strategy. *Journal of Educational Change, 11*, 111–138.

Daly, A. J., & Finnigan, K. (2012). Exploring the space between: Social networks, trust, and urban school district leaders. *Journal of School Leadership*, *22*(3), 493–530.

Daly, A. J., Liou, Y., & Moolenaar, N. M. (2014). The principal connection: Trust and innovative climate in a network of reform. In D. Van Maele, P. B. Forsyth, & M. Van Houtte (Eds.), *Trust and school life* (pp. 285–311). Dordrecht, the Netherlands: Springer Science+Business Media.

Daly, A. J., Moolenaar, N. M., Bolivar, J., & Burke, P. (2010). Relationships in reform: The role of teachers' social network. *Journal of Educational Administration, 48*, 20–49.

Datnow, A., Park, V., & Wohlstetter, P. (2007). *Achieving with data: How high-performing school systems use data to improve instruction for elementary students*. Los Angeles, CA: University of Southern California, Rossier School of Education, Center on Educational Governance.

Degenne, A., & Forsé, M. (1999). *Introducing social networks*. London, England: Sage.

Dirks, K. T., & Ferrin, D. L. (2001). The role of trust in organizational settings. *Organization Science, 12*, 450–467.

Flap, H., & Völker, B. (2001). Goal Specific social capital and job satisfaction: Effects of different types of networks on instrumental and social aspects of work. *Social Networks, 23*, 297–320.

Forsyth, P. B., Adams, C. M., & Hoy, W. K. (2011). *Collective trust: Why schools can't improve without it*. New York, NY: Teachers College Press.

Forsyth, P. B., Barnes, L. L. B., & Adams, C. M. (2006). Trust-effectiveness patterns in schools. *Journal of Educational Administration, 44*, 121–141.

Frank, K. A., Zhao, Y., Penuel, W. R., Ellefson, N., & Porter, S. (2011). Focus, fiddle, and friends: Experiences that transform knowledge for the implementation of innovations. *Sociology of Education, 84*, 137–156.

Glick, W. H. (1985). Conceptualizing and measuring organizational and psychological climate: Pitfalls in multilevel research. *Academy of Management Review, 10*, 601–616.

Goddard, R. D., Tschannen-Moran, M., & Hoy, W. K. (2001). A multilevel examination of the distribution and effects of teacher trust in students and parents in urban elementary schools. *Elementary School Journal, 102*, 3–17.

Hallam P. R., Dulaney, S. K., Hite, J. M., & Smith, H. R. (2014). Trust at ground zero: Trust and collaboration within the professional learning community. In D. Van Maele, P. B. Forsyth & M. Van Houtte (Eds.), *Trust and school life* (pp. 145-170). Dordrecht, The Netherlands: Springer Science+Business Media.

Hansen, M. T. (2002). Knowledge networks: Explaining effective knowledge sharing in multiunit companies. *Organization Science, 13*, 232–248.

Hargreaves, A. (1994). *Changing teachers, changing times: Teachers' work and culture in the postmodern age*. New York, NY: Teachers College Press.

Hargreaves, A. (2007). Sustainable professional learning communities. In L. Stoll & K. S. Louis (Eds.), *Professional learning communities: Divergence, depth and dilemmas* (pp. 181–195). London, England: Open University.

Harrison, D. A., & Klein, K. J. (2007). What's the difference? Diversity constructs as separation, variety, or disparity in organizations. *Academy of Management Review, 32,* 1199–1228.

Hedges, L. V., & Schneider, B. (Eds.). (2005). *The social organization of schooling*. New York, NY: Russell Sage Foundation.

Honig, M. I., & Ikemoto, G. (2008). Adaptive assistance for learning improvement efforts: The case of the Institute for Learning. *Peabody Journal of Education, 83*, 328–363.

Hoy, W. K., & Tschannen-Moran, M. (2003). The conceptualization and measurement of faculty trust in schools: The Omnibus T-Scale. In W. K. Hoy & C. G. Miskel (Eds.), *Studies in leading and organizing schools* (pp. 181–208). Greenwich, CT: Information Age Publishing.

Jackson, C. K., & Bruegmann, E. (2009). Teaching students and teaching each other: The importance of peer learning for teachers. *American Economic Journal: Applied Economics, 1*, 85–108.

Kilduff, M., & Krackhardt, D. (2008). *Interpersonal networks in organizations: Cognition, personality, dynamics and culture*. New York, NY: Cambridge University Press.

Kochanek, J. R., & Clifford, M. (2014). Trust in districts: The role of relationships in policymaking for school improvement. In D. Van Maele, P. B. Forsyth & M. Van Houtte (Eds.), *Trust and School Life* (pp. 313–334). Dordrecht, the Netherlands: Springer Science+Business Media.

Leana, C. R., & Pil, F. K. (2006). Social capital and organizational performance: Evidence from urban public schools. *Organization Science, 17*, 353–366.

Levine, T. H., & Marcus, A. S. (2010). How the structure and focus of teachers' collaborative activities facilitate and constrain teacher learning. *Teaching and Teacher Education, 26*, 389–398.

Lin, N. (2001). *Social capital: A theory of social structure and action*. New York, NY: Cambridge University Press.

Little, J. W. (1990). The persistence of privacy: Autonomy and initiative in teachers' professional relations. *Teachers College Record, 91*, 509–536.

Little, J. W. (2007). Teachers' accounts of classroom experience as a resource for professional learning and instructional decision making. In P. Moss (Ed.), *Evidence and decision making* (pp. 217–240). Chicago, IL: University of Chicago Press.

Lortie, D. C. (1975). *School: A sociological study.* Chicago, IL: The University of Chicago Press.

Lortie, D. C. (2002). *Schoolteacher: A sociological study* (2nd ed.). Chicago, IL: The University of Chicago Press.

Louis, K. S. (1998). Effects of teacher quality of work life in secondary schools on commitment and sense of efficacy. *School Effectiveness and School Improvement, 9*, 1–27.

Louis, K. S. (2006). Changing the culture of schools: Professional community, organizational learning and trust. *Journal of School Leadership, 16*, 477–489.

Louis, K. S. (2007). Trust and improvement in school. *Journal of Educational Change, 8,* 1–24.

Louis, K., Marks, H., & Kruse, S. (1996). Teachers' professional community in restructuring schools. *American Educational Research Journal, 33*, 757–798.

McLaughlin, M. W., & Talbert, J. E. (2001). *Professional communities and the work of high school teaching*. Chicago, IL: The University of Chicago Press.

Mishra, A. K. (1996). Organizational responses to crisis: The centrality of trust. In R. Kramer & T. Tyler (Eds.), *Trust in organizations: Frontiers of theory and research* (pp. 261–287). Thousand Oaks, CA: Sage.

Moolenaar, N. M. (2012). A social network perspective on teacher collaboration in schools: Theory, methodology, and applications. *American Journal of Education, 119*, 7–39.

Moolenaar, N. M. (2010). Ties with potential. Nature, antecedents, and consequences of social networks in school teams (Unpublished doctoral dissertation). Amsterdam, The Netherlands: University of Amsterdam.

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*, 623–670.

Moolenaar, N. M., Daly, A. J., & Sleegers, P. J. C. (2011). Ties with potential: Social network structure and innovative climate in Dutch schools. *Teachers College Record, 113*, 1983–2017.

Moolenaar, N. M., Karsten, S., Sleegers, P. J. C., & Daly, A. J. (2014). Linking social networks and trust at multiple levels: Examining Dutch elementary schools. In D. Van Maele, P. B. Forsyth & M. Van Houtte (Eds.), *Trust and school life* (pp. 207–228). Dordrecht, The Netherlands: Springer Science+Business Media.

Moolenaar, N. M., & Sleegers, P. J. C. (2010). Social networks, trust, and innovation: The role of relationships in supporting an innovative climate in Dutch schools. In A. J. Daly (Ed.), *Social network theory and educational change* (pp. 97–114). Cambridge, MA: Harvard Education Press.

Moolenaar, N. M., Sleegers, P., Karsten, S., & Zijlstra, B. J. H. (2009). *A social capital perspective on professional learning communities: Linking social networks and trust*. Paper presented at the Annual Meeting of the American Educational Research Association (AERA), San Diego, CA.

Morrison, E. W. (2002). Newcomers' relationships: The role of social network ties during socialization. *Academy of Management Journal, 45*, 1149–1160.

Nahapiet, J., & Ghoshal, S. (1998). Social capital, intellectual capital, and the organizational advantage. *The Academy of Management review, 23*, 242–266.

Newman, M. E. J., Barabasi, A. L., & Watts, D. J. (2006). *The structure and dynamics of networks*. Princeton, NJ: Princeton University Press.

Nias, J. (2005). Why teachers need their colleagues: A developmental perspective. In D. Hopkins (Ed.), *The practice and theory of school improvement* (pp. 223–237). The Netherlands: Springer.

Penuel, W. R., Riel, M. R., Krause, A., & Frank, K. A. (2009). Analyzing teachers' professional interactions in a school as social capital: A social network approach. *Teachers College Record, 111*, 124–163.

Penuel, W. R., Sun, M., Frank, K. A., & Gallagher, H. A. (2012). Using social network analysis to study how collegial interactions can augment teacher learning

from external professional development. *American Journal of Education, 119*, 103–136.

Price, H. E. (2012). Principal-teacher interactions: How affective relationships shape principal and teacher attitudes. *Educational Administration Quarterly, 48*, 39–85.

Reagans, R., & McEvily, B. (2003). Network structure and knowledge transfer: The effects of cohesion and range. *Administrative Science Quarterly, 48*, 240–267.

Robins, G., Elliott, P., & Pattison, P. (2001). Network models for social selection processes. *Social Networks, 23*, 1–30.

Rousseau, D., Sitkin, S., Burt, R., & Camerer, C. (1998). Not so different after all: A cross-discipline view of trust. *Academy of Management Review, 23*, 393–404.

Sahlberg, P. (2007). Education policies for raising student learning: The Finnish approach. *Journal of Educational Policy, 22*, 141–171.

Salancik, G. R., & Pfeffer, J. (1978). A social information processing approach to job attitudes and task design. *Administrative Science Quarterly, 23*, 224–253.

Schechter, C., & Atarchi, L. (2014). The meaning and measure of organizational learning mechanisms in secondary schools. *Educational Administration Quarterly, 50*, 577–609.

Schechter, C., Sykes, I., & Rosenfeld, J. (2008). Learning from success as leverage for school learning: Lessons from a national programme in Israel. *International Journal of Leadership in Education: Theory and Practice, 11*, 301–318.

Scott, J. (2000). *Social network analysis* (2nd ed.). London, England: Sage.

Shamir, B., & Lapidot, Y. (2003). Trust in organizational superiors: Systemic and collective considerations. *Organization Studies, 24*, 463–491.

Skaalvik, E. M., & Skaalvik, S. (2011). Teacher job satisfaction and motivation to leave the teaching profession: Relations with school context, feeling of belonging, and emotional exhaustion. *Teaching and Teacher Education, 27*, 1029–1038.

Smith, P. A., Hoy, W. K., & Sweetland, S. R. (2001). Organizational health of high schools and dimensions of faculty trust. *Journal of School Leadership, 11*, 135–151.

Tsai, W., & Ghoshal, S. (1998). Social capital and value creation: The role of intrafirm networks. *Academy of Management Journal, 41*, 464–476.

Tschannen-Moran, M. (2014). *Trust matters: Leadership for successful schools* (2nd ed). San Francisco, CA: Jossey-Bass.

Tschannen-Moran, M. (2009). Fostering teacher professionalism in schools: The role of leadership orientation and trust. *Educational Administration Quarterly, 45*, 217–247.

Tschannen-Moran, M., & Hoy, W. K. (2000). A multidisciplinary analysis of the nature, meaning, and measurement of trust. *Review of Educational Research, 70*, 547–593.

Tschannen-Moran, M., & Hoy, A. W. (2001). Teacher efficacy: capturing an elusive construct. *Teaching and Teacher Education, 17*, 783–805.

Uzzi, B. (1997). Social structure and competition in interfirm networks: The paradox of embeddedness. *Administrative Science Quarterly, 42*, 35–67.

Van Maele, D., Forsyth, P. B., & Van Houtte, M. (Eds.). (2014). *Trust and school life: The role of trust for learning, teaching, leading, and bridging*. Dordrecht, The Netherlands: Springer Science+Business Media.

Van Maele, D., & Van Houtte, M. (2009). Faculty trust and organizational school characteristics: An exploration across secondary schools in Flanders. *Educational Administration Quarterly, 45*, 556–589.

Van Maele, D., & Van Houtte, M. (2011). Collegial trust and the organizational context of the teacher workplace: The role of a homogeneous teachability culture. *American Journal of Education, 117*, 437–464.

Van Maele, D., & Van Houtte, M. (2012). The role of teacher and faculty trust in forming teachers' job satisfaction: Do years of experience make a difference? *Teaching and Teacher Education*, *28*, 879–889.

Van Maele, D., & Van Houtte, M. (forthcoming). Trust in school: A pathway to inhibit teacher burnout? *Journal of Educational Administration*.

Walker, G., Kogut, B., & Shah, W. (1997). Social capital, structural holes, and the formation of an industry network. *Organizational Science*, *8*, 109–125.

Wasserman, S., & Faust, K. (1994). *Social network analysis: Methods and applications*. New York, NY: Cambridge University Press.

Wellman, B., & Berkowitz, S. D. (1998). *Social structures: A network approach*. Cambridge, MA: Cambridge University Press.

Young, V. (2008). Supporting teachers' use of data: The role of organization and policy. In E. B. Mandinach & M. Honey (Eds.), *Data driven school improvement: Linking data and learning* (pp. 87–106). New York, NY: Teachers College Press.

CHAPTER 11

TRUST AND FRICTION

A Multilevel Analysis of Elementary Math Classrooms

W. Sean Kearney and Julie Gray

ABSTRACT

Understanding how to maximize classroom climate factors that may positively affect student achievement scores in mathematics is vital to school improvement efforts. The focus of this study is to examine the impact teacher trust in clients and classroom friction have on elementary math achievement. Both student and teacher perceptions are explored. Surveys were collected from 482 students and their teachers, from 26 math classrooms, across 10 elementary schools in Texas. Intraclass correlations were calculated to identify the level of variation in math achievement between classrooms. Next, a random coefficient HLM model was employed to identify the specific impacts that classroom friction and teacher trust in students and parents (clients) have on elementary math achievement. Finally, an intercepts as slope HLM model was created to isolate potential interaction effects between Level 1 (classroom) and Level 2 (school) variables. The results of the analyses indicate that both teacher trust in clients and classroom friction make statistically

Leadership and School Quality, pp. 197–214

significant impacts on the variance in elementary math achievement. Teacher years of experience on campus and socioeconomic status (SES) are also examined. Implications are discussed.

According to the U.S. Secretary of Education Arne Duncan, "Our students are on the path to progress … [but] we still have a long journey to go before all of America's children get an excellent education" (Duncan, 2012). In particular, there has been a strong push recently to enhance mathematics education, as math is seen as a gateway to future employment opportunities (Kerry, 2004). Hiring and retaining qualified math teachers at the K–12 level remains a challenge (McCoubrey, 2001). In order to be effective instructors, math teachers must not only understand the curriculum, they must also be able to connect well with their students (Lewis, Ream, Bocian, Cardullo, Hammond, & Fast, 2012). The quality of interpersonal relationships between teachers and students is one aspect of classroom climate.

Trickett and Moos (1973) proposed that classroom climate is made up of three interacting variables: interpersonal relationships (between teacher and students and among students themselves), system maintenance, and goal orientation. One goal of the current study is to provide an in-depth look at the impact of interpersonal relationships within the math classroom. Specifically, this study was undertaken in order to identify some of the specific aspects of classroom climate that may significantly affect math achievement. This work is grounded in the conceptual models of Hoy, Tarter, and Woolfolk Hoy (2006); Goddard, Salloum, and Berebitsky (2009); and Tschannen-Moran (2009), who have each explored various aspects of trust in schools. Importantly, this research attempts to expand upon these authors' work by exploring not only teachers', but also students' perceptions of relationships at the classroom level. By conducting this study, the authors hope to add useful information to the extant literature on classroom climate and elementary math achievement. In order to inform our investigation, the discussion now turns to a review of the literature.

LITERATURE REVIEW

Much has been written about mathematics, student achievement, and classroom climate (Grouws & Cebulla, 2000; Ysseldyke, Spicuzza, Kosciolek, & Boys, 2003), but relatively little research has been conducted regarding the relationship between teacher trust, classroom friction, and math achievement at the elementary level. We plan to investigate how these variables interact collectively and with each other. Researchers who have studied

math achievement have identified the context of the classroom as an area that may provide much needed information to guide practice and policy (Rivkin, Hanushek, & Kain, 2005).

According to *A Nation at Risk: The Imperative for Educational Reform*, public schools have been, "eroded by a rising tide of mediocrity that threatens our very future as a nation and a people" (United States National Commission on Excellence in Education, 1983, p. 5). Berliner and Biddle (1995) questioned the statistical methodology and citations for these findings and asserted that the report was misleading the nation about our public school systems. Peterson (2003) pointed out that *A Nation at Risk* focused on high school findings while disregarding the importance and role of K–8th grade education, and Goodlad (2003) argued that the connection between the nation's economy and student achievement was overstated in the government report. Despite its many limitations, one positive outcome of the publication of *A Nation at Risk* is that it focused attention to the need for educational reform. Thirty years later, the educational system in the United States still faces a number of challenges, in particular in the area of math (United States Department of Education, 2008). It is the goal of this study to examine trust and its potential impact on elementary math achievement.

Math Achievement

"National achievement data show that elementary school students in the United States, particularly those from low socioeconomic backgrounds, have weak math skills" (Argodini, Harris, Thomas, Murphy, & Gallagher, 2009, p. 1). There are many factors that can affect student achievement in math, including but not limited to: gender bias, self-confidence, parental involvement, learning styles, family structure, previous experiences in math, level of education of parents, and emphasis placed on education at home (Campbell, Hombo, & Mazzeo, 2000; Epstein, 1991; Fennema & Peterson, 1986; National Commission on Children, 1991; White, 2001).

It is certainly true that a student's academic achievement is a "cumulative function of current and prior family, community, and school experiences" (Rivkin, Hanushek , & Kain, 2005, p. 422). In a longitudinal study performed in Texas about academic achievement, Rivkin and his colleagues (2005) took a closer look at teacher and classroom level factors, the results of which revealed, "large differences among teachers in their impacts on achievement and show[ed] that high quality instruction throughout primary school could substantially offset disadvantages associated with low socioeconomic background" (p. 419). In other words, teachers who provide higher quality instruction can counterbalance the negative effects of students from low SES backgrounds.

To be sure, parents also play a critical role in encouraging their children to act responsibly, complete homework, and work hard in school (White, 2001). "Parents' attitudes, expectancies, and beliefs about schooling and learning guide their behavior with their children and have a causal influence on their children's developing achievement attitudes and behaviors" (White, 2001, p. 38). Involving parents in decisions related to their child's education has demonstrated a positive effect on student achievement in math (White, 2001). Viewing parents as partners in the educational process requires that teachers have trust in parents (Tschannen-Moran, 2004).

To be sure, trust by itself is not sufficient to impart math knowledge. Grouws and Cebulla (2000) reviewed the current literature to determine which instructional strategies had the greatest positive effect on math achievement. The teaching practices they identified include: "opportunity to learn (practice), focus on meaning (understanding), problem solving, opportunities for invention and practice (discovery learning), [teachers'] openness to student solutions and student interactions, small group learning (cooperative learning), whole-class discussion, focus on number sense, use [of] concrete materials (manipulatives), and use of calculators" (Grouws & Cebulla, 2000, pp. 1–3). It is our contention that sound instructional strategies are maximized when students are comfortable in the learning environment.

Elementary teachers, like students, can experience anxiety about math. This is especially true of pre-service teachers (Swars, Daane, & Giesen, 2006). Educators with high math anxiety tend to teach in a more traditional, teacher-centered, whole-class instruction manner, rather than integrating learner-centered instructional strategies (Swars et al., 2006). Further, there is much discussion about how teachers' anxiety, or lack of confidence in their knowledge, about mathematics can negatively affect students' feelings and attitudes about the subject area, especially in elementary school (Jackson & Leffingwell, 1999; Ramirez, Gunderson, Levine, & Beilock, 2013; Swars et al., 2006; Wood, 1988).

Geist (2000) asserts that students with "negative attitudes towards mathematics" (p. 24) have what can be described as math anxiety. Many researchers have found that negative attitudes about math begin as early as kindergarten (Ashcraft, 2002; Popham, 2008; Rameau & Louime, 2007). Students, especially elementary students, experience math anxiety, which is often, "caused by past classroom experiences, parental influences, and remembering poor past math performance" (Scarpello, 2007, p. 35). In the end, students who are afraid of failing in mathematics may avoid completing math related tasks (Ramirez et al., 2013).

Teachers who are encouraging can influence students by reducing math anxiety (Scarpello, 2007). The use of student-centered learning and manipulatives for elementary students has been shown to be highly effective in

improving math achievement (Chavez & Widmer, 1982). As students gain confidence in their abilities mathematically, student achievement increases, as does their self-efficacy (Ramirez et al., 2013). Encouragingly, many teachers express positive attitudes toward professional development, particularly when it yields a positive impact on classroom climate and student achievement (Masuda, Ebersole, & Barrett, 2012).

Classroom Friction

How can teachers establish a positive classroom climate, promote high expectations of students, and encourage students to work cooperatively within the classroom? Learning how to deal with in-class stressors and reducing interpersonal problems with peers has been shown to increase levels of achievement in learning outcomes (Sharma, Petosa, & Heaney, 1999). Is it possible that a teacher can interpret the climate differently than the students perceive it to be? Patrick, Turner, Meyer, and Midgley (2003) found that when teachers create environments in which students feel psychologically uncomfortable, those students are more likely to avoid engaging in schoolwork. In fact, discrepancies between teacher and student perceptions of classroom climate have been shown to negatively correlate with student learning (Deemer, 2004). Thus, classroom climate affects the level of respect, trust, and learning that occurs among teachers and students. A healthy environment can improve student achievement, self-efficacy and confidence, and motivation to succeed in school, whereas tension in the classroom can have detrimental effects on student learning (Stuart, 2000).

Friction in the classroom is often a symptom of tension or conflict between teacher and students (Sink & Spencer, 2007). Burnett (2002) noted that student-teacher relationships must be constructive in nature for the classroom climate to be healthy and productive. However, "many teachers struggle with the realization that their classroom contains students with a wide range of skills, but they can only teach to one skill at a time," which can result in students feeling frustrated when their needs are not met (Ysseldyke, Spicuzza, Kosciolek, & Boys, 2003, p. 164). Some friction may be considered normal or healthy, however too much friction can affect the climate of the classroom negatively (Stuart, 2000). The negative effects of classroom friction appear to pervade across student groups, as Bennett (2001) found that "in classrooms with reduced friction, there appeared to be a more equal distribution of academic achievement among students regardless of gender or race" (p. 38).

How, then, does one go about reducing classroom friction? Linares et al. (2005) sought to identify whether improved socialization in elementary

classrooms would lead to increased math achievement. In a study of 119 upper elementary students , these authors conducted an intervention designed to improve the social-emotional abilities of fourth and fifth grade students. After working with these students over the course of two years, they found that students self-reported lower levels of friction. Importantly, they found a corresponding rise in math scores as well (Linares et al., 2005).

Teacher Trust in Clients

Trust has been described as an essential aspect of school effectiveness (Bryk & Schneider, 2002; Hoy & Tschannen-Moran, 1999; Tschannen-Moran, 2009). It is important that teachers have trust in their clients, as "teacher behaviors shape parent trust in schools and student trust in teachers" (Forsyth, Adams, & Hoy, 2011, p. 65). One reason teacher behaviors have such a strong impact on the climate of a classroom is because students look to the teacher to learn how they themselves should behave (Torney-Purta, Lehmann, Oswald, & Schulz, 2001). Often, this lesson is learned within the first few days of school and can be difficult to alter thereafter (Frey, Hirschstein, & Guzzo, 2000). Poor teacher-student interactions can have deleterious effects. When teachers create environments in which students feel psychologically uncomfortable, those students are more likely to avoid engaging in schoolwork (Patrick et al., 2003).

Teachers with a high level of trust in their clients view parents as partners who are also working in the best interest of the students (Forsyth, Adams, & Hoy, 2011; Gray & Tarter, 2012). Strong teacher trust in clients "leads to high levels of collective efficacy in schools [in which] teachers come to share the belief that their school can have positive effects on students" (Forsyth et al., 2011, p. 89). Most importantly, "trust is a strong predictor of several important outcomes for schools, including student achievement" (Goddard et al., 2009, p. 298). In a study of 780 third grade classrooms, the National Institute for Child Health and Human Development (2005) found that student engagement in academic activities was highest in classrooms with high levels of emotional support. Thus, when students, teachers, and parents have high levels of trust in and cooperation with one another, teaching and learning improve (Hoy et al., 2006).

METHOD

Participants

The authors examined classroom climate data collected during the 2010-2011 school year. During that year, a total of 2,340 students in fourth and fifth grade completed the My Class Inventory (MCI) (Fisher & Fraser,

1981) and 74 teachers from the corresponding classrooms completed the Teacher Academic Optimism Scale for Elementary Teachers (TAOS-E) (Hoy et al., 2006). First, all nonmath classrooms' data were removed. Only math classrooms that had a calculable percentile rank in the state for math achievement on the Texas Assessment of Knowledge and Skills for 2011 were included for analysis. Next, researchers excluded all student data from classrooms that did not have a corresponding teacher survey. This resulted in a total of 482 student surveys that were selected for analysis. Corresponding teacher surveys from 26 different mathematics classrooms, located within 10 public elementary schools in Texas, were also included for statistical analysis. SES was measured as the percentage of students qualifying for free or reduced-price lunch, which ranged from 10% to 71% for campuses participating in this study.

Instrumentation and Definition of Terms

Teacher trust in clients was measured utilizing the TAOS-E (Hoy et al., 2006). The TAOS-E is a three-factor instrument that measures teacher self-efficacy, academic emphasis, and teacher trust in clients. Sample items from this instrument include statements such as, "I can trust the parents of my students," and, "I have confidence in my students" (Woolfolk Hoy, Hoy, & Kurz, 2008). Items are measured on a five-point Likert scale ranging from "never" to "always" (Woolfolk Hoy et al., 2008).

Student perceptions of classroom friction were measured utilizing the MCI (Fisher & Fraser, 1981). The MCI is a five-factor instrument that measures friction, cohesion, competition, difficulty, and satisfaction. Sample items from the friction section of the MCI include, "Students are always fighting with each other," and, "Some students in our class are mean" (Settlage, 2011). Students respond to items by selecting either yes, no, or neither yes nor no.

Two control variables are included in this study. The first control variable is the number of years of teacher experience on campus. This variable resides at Level 1 and was selected based on previous studies that have identified teacher experience as a useful predictor of student success (Ingersoll, Merrill, & May, 2012). The second control variable utilized in this study is SES, which was calculated at Level 2 by utilizing the percentage of students qualifying for free and reduced lunch as a proxy for the SES of the student population by campus. An overwhelming number of educational studies have identified SES as a strong predictor of student achievement on tests (Books, 2007; Goddard et al., 2009; Hoy, 2012; Hoy, Smith, & Sweetland, 2002; Riegle-Crumb & Grodsky, 2010). Thus, it was determined that this item would be included as a control variable in order to get a more accurate picture of the factors that influence math achievement.

Math achievement was measured utilizing classroom scale score percentile rank in the state on the Texas Assessment of Knowledge and Skills for the 2010–2011 academic year (Texas Education Agency, 2011). There are inherent difficulties with utilizing Texas state achievement scores, including skewed data (Archer, 2003) and a moving target for passing standards that some have claimed mirrors election-year politics (Mellon, 2010). However, the percentile rank in the state is a measure that is relatively immune from political gamesmanship, as the percentile rank in the state simply compares students' scores to one another. Examples of percentile rank include college entrance exams and IQ tests in which test takers receive results informing them they have scored somewhere between the 1st and 99th percentile as compared with everyone else who took the same exam during a specific time frame. The simple methodology of calculating percentile rank stays consistent year over year regardless of the cut score for passing established by the state.

Data Analysis

Classrooms are nested within schools. For the purpose of this study, classroom level data is identified as Level 1 data, and school level data is identified as Level 2 data. Three of the independent variables in this study occur at Level 1: teacher trust in clients, classroom friction, and teacher years of experience on campus. SES occurs at the school level. In the past, social science researchers have aggregated individual level variables to the group level (e.g., district, school, and classroom), however this has the potential to introduce aggregation bias, heterogeneity of regression among groups, and misestimated standard errors (Raudenbush & Bryk, 2002). As a result, the authors determined it was necessary to analyze the data using a multilevel analysis technique, which keeps data at the level in which they naturally reside. This led to the authors of this study to select a two level hierarchical linear model.

First, an estimation of an unconditional, or intercept only, model was conducted to determine the existence and degree of unexplained variance in math achievement between classrooms. Second, a Level 1 model estimation was completed, which included ratings of teacher trust in clients, classroom friction, and teacher years of experience on campus. Finally, a full Level 2 model estimation followed with SES serving as the Level 2 predictor of the intercept and the Level 1 slopes. All variables were treated as continuous.

RESULTS

Descriptive Statistics

Percentile rank in the state for mathematics ranged from the 37th percentile for the lowest performing classroom to the 81st percentile for the

highest performing classroom in this study. Of the 26 classrooms in this study, 23 classrooms ranked above the 50th percentile and three classrooms were ranked below the state average.

A total of 482 students from 26 elementary mathematics classrooms (14 fourth grade classrooms and 12 fifth grade classrooms) completed the MCI, which served as the source of data for classroom friction within this study. Classroom friction averages ranged from a low of 1.42 to a high of 2.58 on a three-point scale. Each of the teachers from the 26 classrooms completed the TAOS-E (Hoy et al., 2006), which provided information on teacher trust in clients for the purpose of this study. Teacher trust in clients scores ranged from a low of 2.0 to a high of 4.75 on a 5-point scale.

The average years of experience on campus for these 26 teachers was 3.73, with the least experienced math teacher having one year of experience, and the most veteran math teacher having nine years of experience on campus. The percentage of students on campus who qualify for free or reduced lunch ranged from 10% for the wealthiest school in this study to 71% for the poorest school in this study (see Table 11.1).

Table 11.1. Descriptive Data

	Sample	*Mean of Participant Scores/ Responses*	*Range of Participant Scores/ Responses*	*Range of Possible Scores/ Responses*	*Data Level*
Scale Score Percentile Rank in the State for Mathematics	26 math classrooms	61st Percentile	37th–81st percentile	0–99th percentile	Level 1 (Classroom)
Classroom Friction	482 student respondents	1.96	1.42–2.58	1–3	Level 1 (Classroom)
Teacher trust in Clients	26 math teachers	3.94	2.0–4.75	1–5	Level 1 (Classroom)
Years of Teacher Experience	26 math teachers	3.73	1–9	0.1–__	Level 1 (Classroom)
Parent of students on campus qualifying for free or reduced lunch	10 elementary schools	38%	10–71%	0–100%	Level 2 (School)

Variability of Math Achievement between Classrooms

The one-way ANOVA with random effects model (also known as the null or unconditional model) was used to determine the existence and degree of unexplained variance in math achievement between classrooms. Findings indicated that unexplained variation existed in math achievement between classrooms ($\chi^2 = 46.25$, $p < .001$). The intraclass correlation (ICC), or the ratio of between-group variance to total variance, was .6154, indicating that 61.5% of the overall variation in math achievement lies between classrooms (see Table 11.2).

Table 11.2. Math Achievement: Results from the One-Way ANOVA Model

Fixed Effects	*Coefficient (SE)*	*t (df)*	*p – value*
Model for Intercept (β_o)			
Intercept (γ_{00})	62.19 (2.6)	23.78 (9)	< .001
Random Effects	62.19 (2.6)	23.78 (9)	< .001
(Variance Components)	Variance	χ^2 (df)	*p* – value
Var. in school means, (τ_{oo})	53.87	46.25 (9)	< .001
Var. within schools, (σ^2)	33.66		

One Way ANOVA Model in Equation Format:

Level 1 (Classroom):

$$MathAchievement = \beta_{0j} + r_{ij}$$

Level 2 (School):

$$\beta_{0j} = \gamma_{00} + u_{0j}$$

Impact of Level 1 Factors on Math Achievement

In the random coefficient model, variables at the classroom level were added to the Level 1 equation to assess whether any of these factors were related to math achievement. There is a statistically significant difference in the level of math achievement ($\gamma_{10} = 4.77$, $t = 1.86$, $p < .05$), favoring classrooms in which teachers expressed high levels of trust in clients. Classroom friction is a statistically significant negative predictor of math achievement ($\gamma_{20} = -11.50$, $t = -2.148$, $p < .05$). However, the number of years of experience teachers had on campus was not a significant predictor of math achievement for the classrooms within this study ($\gamma_{30} = 0.88$, $t = 0.49$, $p =$ not significant). Together, these three factors accounted for 24% of the variance in math achievement (see Table 11.3).

Table 11.3. Math Achievement: Results From the Random Coefficient Model

Fixed Effects	*Coefficient (SE)*	*t (df)*	*p – value*
Model for Intercept (β_o)			
Intercept (γ_{00})	58.52 (2.96)	19.76 (9)	< .001
Model for Teacher trust slope (β_1)			
Intercept (γ_{10})	4.77 (1.86)	2.56 (22)	0.018
Model for Class Friction slope (β_2)			
Intercept (γ_{20})	–11.50 (5.35)	–2.15 (22)	0.043
Model for Teacher Years on Campus slope (β_3)			
Intercept (γ_{30})	0.88 (0.49)	1.81 (22)	0.084
Random Effects			
(Variance Components)	Variance	χ^2 (df)	*p* – value
Var. in school means, (τ_{oo})	36.03	41.17 (9)	< .001
Var. within schools, (σ^2)	25.62		

Random Coefficient Model in Equation Format:

Level 1 (Classroom):

$$MathAchievement = \beta_{0j} + \beta_{1j}\,(TeacherTrust) + \beta_{2j}\,(Friction) + \beta_{3j}\,(YearsonCampus) + r_{ij}(ResidualUnexplainedVariance)$$

Level 2 (School):

$$\beta_{0j} = \gamma_{00} + u_{0j}$$
$$\beta_{1j} = \gamma_{10}$$
$$\beta_{2j} = \gamma_{20}$$
$$\beta_{3j} = \gamma_{30}$$

Impact of SES on Math Achievement

In the intercepts and slopes-as-outcomes model, SES at the school level was added to the Level 2 equation to assess whether teacher trust in clients, classroom friction, and teacher years of experience on campus were related to math achievement when factoring in school wealth or SES. A statistically significant relationship existed between teacher trust in clients and math achievement, regardless of SES ($\gamma_{10} = 4.709$, $t = 2.66$, $p < .05$). A statistically significant negative relationship existed between classroom friction

and math achievement, regardless of SES (γ_{20} = -11.37, t = -2.23, $p < .05$). However, the years of teacher experience on campus did not make a significant contribution to the variance in math achievement (γ_{30} = 0.50, t = 1.14, p = not significant) (See Table 11.4).

Table 11.4. Math Achievement: Results From the Intercepts and Slopes-as-Outcomes Model

Fixed Effects	*Coefficient (SE)*	*t (df)*	*p – value*
Model for Intercept (β_o)			
Intercept (γ_{00})	70.42 (3.88)	18.13 (8)	<.001
SES (γ_{01})	–.29 (.07)	–4.22 (8)	0.003
Model for Teacher trust slope (β_1)			
Intercept (γ_{10})	4.709 (1.77)	2.66 (21)	0.015
Model for Class Friction slope (β_2)			
Intercept (γ_{20})	–11.37 (5.09)	–2.23 (21)	0.036
Model for Teacher Years on Campus slope (β_3)			
Intercept (γ_{30})	0.50 (0.44)	1.14 (21)	0.267
	Variance	χ^2 (df)	*p* – value
Var. in school means (τ_{oo})	6.44	12.70 (8)	0.122
Var. within schools (σ^2)	23.14		

Intercepts and Slopes as Outcomes Model in Equation Format:

Level 1 (Classroom):

$$Math\ Achievement_{ij} = \beta_{0j} + \beta_{1j}\,(TeacherTrust) + \beta_{2j}\,(Friction) + \beta_{3j}\,(YearsonCampus) + r_{ij}\,(ResidualUnexplainedVariance)$$

Level 2 (School):

$$\beta_{0j} = \gamma_{00} + \gamma_{01}(SES)_j + u_{0j}$$
$$\beta_{1j} = \gamma_{10}$$
$$\beta_{2j} = \gamma_{20}$$
$$\beta_{3j} = \gamma_{30}$$

DISCUSSION

In this study, the unconditional model identifies whether there is a significant difference in the level of math achievement between classrooms. The results of this analysis, known as the ICC, indicate that, in fact, students do

achieve at significantly higher levels in mathematics in some classes than they do in others. The existence of variance at the classroom level allows us to further examine which classroom level factors may be contributing to this variance.

The random coefficient model explored whether three classroom level factors play a role in determining the level of math achievement. Teacher trust in clients emerged as a significant determinant of math achievement. Similarly, student perception of classroom friction was significantly related to math achievement. However, not all of the variability in math achievement lies between classrooms. Because SES has historically proven to be such a large predictor of student achievement on tests, the authors of this study felt it was important to include SES in the examination in order to report the impact of each independent variable as accurately as possible.

Perhaps not surprisingly, SES emerged as a strong predictor of student success. After all, school wealth has been shown to be a strong predictor of student success on tests (Books, 2007; Goddard et al., 2009; Hoy et al., 2002; Riegle-Crumb & Grodsky, 2010). Perhaps the most significant finding within our study is that enhanced teacher trust in clients and reduced classroom friction emerged as significant predictors of math achievement, even when factoring in SES. This means that students achieved at higher levels in classrooms in which teachers expressed high levels of trust in their clients, along with classrooms that had reduced levels of classroom friction, achieved at significantly higher levels than classrooms with lower levels of trust and/or higher levels of friction. This was just as true in wealthy schools as it was in impoverished schools. In fact, for each one-point rise in teacher trust in clients, elementary math achievement rose by 4.7%, regardless of SES.

Classroom friction emerged as a significant negative predictor of math achievement for the classrooms in this study. For each one-point rise in the level of classroom friction, class average percentile rank in the state declined by 11.4% (again, regardless of SES). Teacher trust in clients and student perceptions of classroom friction may be related to one another as well. If teachers are confident in their own instructional and disciplinary abilities, this may help them to trust the students in their classrooms and allay friction concerns on the part of students. While there may be very little that teachers and administrators can do to improve the SES of families who attend their school, teacher trust in clients and classroom friction are well within the campus' locus of control. Recall that friction is often present in large classes in which students possess divergent levels of math abilities from one another (Stuart, 2000; Ysseldyke et al., 2003). Grouping students by ability and placing them in small groups with teachers who can focus on their needs may be one way to reduce friction in math classrooms.

Interestingly, the number of years of teacher experience on campus was not significantly related to math achievement. This may be because the range of experience was quite limited for the participants in this study (range of experience = 1–9 years (see Table 11.1)). A larger study with a broader range of teacher experience may shed greater light on this relationship. However, the lack of ability to retain quality math teachers has been documented as a problem nationwide (Ingersoll et al., 2012), so it is also possible that the reason the range of experience was so limited was because these campuses, like many across the nation, face a high level of attrition of qualified math teachers.

LIMITATIONS

Because this study examined only elementary math classrooms in 10 public schools in Texas, the generalizability of findings is limited. It may be of value to the field for future research to be conducted in a wider array of classrooms. For example, the authors intend to conduct future research to determine if similar results will be found at the secondary level. It may also be useful to examine whether similar results would be found in different regions of the United States Additionally, while this study utilized both teacher and student perceptions of classroom climate, administrator and parent perceptions were not included. It may be interesting for future studies to assess teacher, student, parent, and administrator perceptions of the climate in math classrooms in order to provide a comprehensive view of a variety of classroom climate factors and their relationship with math achievement. Another interesting follow up question that was not explored in this study–why do some teachers trust their clients more than other teachers do? It is possible that this trust is related to the teacher's sense of math self-efficacy. Alternatively, teacher trust in clients may be a reflection of the level of order and discipline that the teacher is able to maintain in the classroom. Further study is warranted to examine what may be causing this difference.

CONCLUSION

Math education is vital to both educational and employment success. Improving math education is a stated goal of both state and federal Departments of Education within the United States (Duncan, 2012). Nevertheless, the U.S. continues to lag behind many other countries in math achievement (Hanushek, Peterson, Woessman, & Ludger, 2014). Understanding the factors that contribute to math achievement is an essential component

of school improvement efforts. This study isolated two specific classroom climate factors—teacher trust in clients and classroom friction—in order to determine whether either factor is significantly related to math achievement. For the classrooms in this study, both teacher trust in clients and student perceptions of classroom friction were significantly related to math achievement. Although these are not the only factors which contribute to student success, increased teacher trust and reduced levels of classroom friction may be one tool that principals and teachers can utilize to increase achievement in elementary math classrooms.

REFERENCES

Archer, J. (2003). Houston case offers lesson on dropouts. *Education Week*, *23*(4), 1–17.

Argodini, R., Harris, B., Thomas, M., Murphy, R., & Gallagher, L. (2009). Achievement effects of four elementary school math curricula: Findings for first and second graders. *NCEE (National Center for Education Evaluation) Study Snapshot*, 1–4.

Ashcraft, M. H. (2002). Math anxiety: Personal, educational, and cognitive consequences. *Current Directions in Psychological Science*, *11*(5), 181–185.

Bennett, J. (2001). *The relationship between classroom climate and student achievement* (Doctoral dissertation). Retrieved from Proquest Dissertations and Theses. (304714963).

Berliner, D. C., & Biddle, B. J. (1995). *The manufactured crisis: Myths, fraud, and the attack on America's public schools*. Reading, MA: Addison-Wesley.

Books, S. (2007). What are we talking about when we talk about "closing the achievement gap"? *International Journal of Learning*, *14*(2), 11–17.

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

Burnett, P. C. (2002). Teacher praise and feedback and students' perceptions of the classroom environment. *Educational Psychology*, *22*, 6–16.

Campbell, J. R., Hombo, C. M., & Mazzeo, J. (2000). *NAEP 1999 trends in academic progress: Three decades of student performance*. Washington, DC: National Center for Education Statistics.

Chavez, A., & Widmer, C. C. (1982). Math anxiety: Elementary teachers speak for themselves. *Educational Leadership*, *39*(5), 387–388.

Deemer, S. A. (2004). Classroom goal orientation in high school classrooms: Revealing links between teacher beliefs and classroom environments. *Educational Research*, *46*, 73–90.

Duncan, A. (2012, December 11). How do U.S. students compare with their peers around the world? *Huffington Post*. Retrieved from http://www.huffingtonpost.com/arne-duncan/how-do-us-students-compar_b_2279307.html

Epstein, J. L. (1991). Effects on student achievement of teachers' practices of parent involvement. In S. B. Silvern (Ed.), *Advances in reading/language research* (pp. 261–276). Greenwich, CT: JAI Press.

Fennema, E., & Peterson, P. (1986). Teacher-student interactions and sex-related differences in learning mathematics. *Teaching and Teacher Education*, *2*(1), 19–42.

Fisher, D. L., & Fraser, B. J. (1981). Validity and use of My Class Inventory. *Science Education*, *65*, 145–156.

Forsyth, P. B., Adams, C. M., & Hoy, W. K. (2011). *Collective trust: Why schools can't improve without it*. New York, NY: Teachers College Press.

Frey, K. S., Hirschstein, M. K., & Guzzo, B. A. (2000). Second step: Preventing aggression by promoting social competence. *Journal of Emotional And Behavioral Disorders*, *8*(2), 102–112.

Geist, E. A. (2000). Lessons from the TIMSS videotape study. *Teaching Children Mathematics*, *7*(3), 180.

Goddard, R. D., Salloum, S. J., & Berebitsky, D. (2009). Trust as a mediator of the relationships between: Poverty, racial composition, and academic achievement evidence from Michigan's public elementary schools. *Educational Administration Quarterly*, *45*(2), 292–311.

Goodlad, J. I. (2003, April). A nation in wait. *Education Week*, *22*(32). Retrieved from http://www.edweek.org/ew/articles/2003/04/23/32goodlad.h22.html?qs=Goodlad

Gray. J. A., & Tarter, C. J. (2012). Collective efficacy, collegial leadership, and a culture of trust: Predicting academic optimism and overall effectiveness. In M. DiPaola & P. Forsyth (Eds.), *Contemporary challenges confronting school leaders* (pp. 93–109). Greenwich, CT: Information Age Publishing.

Grouws, D. A., & Cebulla, K. J. (2000). Improving student achievement in mathematics part 1: Research findings. *ERIC Clearinghouse for Science, Mathematics, and Environmental Education*, ERIC Document No. ED OSE 0009, 1-3.

Hanushek, E.A., Peterson, P.E., & Woessman, L. (2014). U.S. students from educated families lag in international tests. *Education Next*, *14*(4), 9–18.

Hoy, W. K. (2012). School characteristics that make a difference for the achievement of all students: A 40-year odyssey. *Journal of Educational Administration*, *50*, 76–97.

Hoy, W. K., Smith, P. A., & Sweetland, S. R. (2002). The development of the organizational climate index for high schools: Its measure and relationship to faculty trust. *The High School Journal*, *86*(1), 38–49.

Hoy, W. K., Tarter, C. J., & Woolfolk Hoy, A. (2006). Academic optimism of schools: A force for student achievement. *American Educational Research Journal*, *43*(3), 425–446.

Hoy, W. K., & Tschannen-Moran, M. (1999). The five faces of trust: An empirical confirmation in urban elementary schools. *Journal of School Leadership*, *9*, 184–208.

Ingersoll, R., Merrill, L., & May, H. (2012). Retaining teachers. *Educational Leadership*, *69*(8), 30–34.

Jackson, C. D., & Leffingwell, R. J. (1999). The role of instructors in creating math anxiety in students from kindergarten through college. *Mathematics Teacher*, *92*(7), 583.

Kerry, J. (2004). The promise of opportunity. *Phi Delta Kappan*, *86*(2), 115–118.

Lewis J., Ream R., Bocian K., Cardullo R., Hammond K., & Fast L. (2012). Con cariño: Teacher caring, math self-efficacy, and math achievement among Hispanic English learners. *Teachers College Record, 114*(7), 1–42.

Linares, L., Rosbruch, N., Stern, M. B., Edwards, M. E., Walker, G., Abikoff, H. B., & Alvir, J. J. (2005). Developing cognitive-social-emotional competencies to enhance academic learning. *Psychology in the Schools, 42*(4), 405–417.

Masuda, A. M., Ebersole, M. M., & Barrett, D. (2012). A qualitative inquiry: Teachers' attitudes and willingness to engage in professional development experiences at different career stages. *Delta Kappa Gamma Bulletin*, *79*(2), 6–14.

McCoubrey, S. (2001). Recruiting teachers from abroad. *Techniques: Connecting Education & Careers, 76*(5), 33.

Mellon, E. (2010, June 8). A lowered bar raises doubts over TAKS standards. *Houston Chronicle*. Retrieved from http://www.chron.com/news/houston-texas/article/A-lowered-bar-raises-doubts-over-TAKS-standards-1712503.php

National Commission on Children. (1991). *Beyond rhetoric: A new American agenda for children and families. (Publication No. ED336201).* Washington, DC: U.S. Government Printing Office.

National Institute for Child Health and Human Development. (2005). A day in third grade: A large-scale study of classroom quality and teacher and student behavior. *Elementary School Journal*, *105*(3), 305–323.

Patrick, H., Turner, J. C, Meyer, D. K., & Midgley, C. (2003). How teachers establish psychological environments during the first days of school: Associations with avoidance in mathematics. *Teachers College Record, 105*(8), 1521–1558.

Peterson, P. E. (2003). *Our schools and our future: Are we still at risk?* Stanford, CA: Hoover Institution Press.

Popham, W. J. (2008). Timed tests for tykes? *Educational Leadership*, *65*(8), 86–87.

Rameau, P., & Louime, C. (2007). Mathematics phobia: Are the mathematical sciences a pothole in the road of life? *Current Science 93(11),* 1481–1482.

Ramirez, F., Gunderson, E. A., Levine, S. C., & Beilock, S. L. (2013). Math anxiety, working memory, and math achievement in early elementary school. *Journal of Cognition and Development, 14*(2), 187–202. doi:10.1080/15248372.2012.664593

Raudenbush, S., & Bryk, A. (2002). *Hierarchical linear models: Applications and data analysis methods.* Thousand Oaks, CA: Sage.

Riegle-Crumb, C., & Grodsky, E. (2010). Racial-ethnic differences at the intersection of math course-taking and achievement. *Sociology of Education, 83*(3), 248–270.

Rivkin, S. G., Hanushek E. A., & Kain, J. F. (2005). Teachers, schools, and academic achievement. *The Econometric Society*, *73*(2), 417–458.

Scarpello, G. (2007). Helping students get past math anxiety. *Techniques: Connecting Education & Careers*, *82*(6), 34–35.

Settlage, J. (2011). *Teaching science to every child: Using culture as a starting point*. New York, NY: Routledge.

Sharma, M., Petosa, R., & Heaney, C.A. (1999). Evaluation of a brief intervention based on social cognitive theory to develop problem-solving skills among sixth-grade children. *Health Education & Behavior, 26*, 465–477.

Sink, C. A., & Spencer, L. R. (2007). Teacher version of My Class Inventory-short form: An accountability tool for elementary school counselors. *Professional School Counseling*, *11*(2), 129–139.

Stuart, V. B. (2000). Math curse or math anxiety? *Teaching Children Mathematics*, *6*(5), 330.

Swars, S. L., Daane, C. J., & Giesen, J. (2006). Mathematics anxiety and mathematics teacher efficacy: What is the relationship in elementary pre-service teachers? *School Science and Mathematics*, *106*(7), 306–315.

Texas Education Agency. (2011). Academic Excellence Indicator System, AEIS 2010–2011. Retrieved from http://ritter.tea.state.tx.us/perfreport/aeis/

Torney-Purta, J., Lehmann, R., Oswald, H., & Schulz, W. (2001). *Citizenship and education in twenty-eight countries: Civic knowledge and engagement at age fourteen.* Delft, The Netherlands: The International Association for the Evaluation of Educational Achievement.

Trickett, E. J., & Moos, R. H. (1973). Social environment of junior high and high school classrooms. *Journal of Educational Psychology, 65*, 93–102.

Tschannen-Moran, M. (2004). *Trust matters: Leadership for successful schools.* San Francisco, CA: Jossey-Bass.

Tschannen-Moran, M. (2009). Fostering teacher professionalism in schools: The role of leadership orientation and trust. *Educational Administration Quarterly, 45*(2), 217–247.

United States Department of Education. (2008). *A nation accountable: Twenty-five years after a nation at risk*. Washington, DC: U.S. Government Printing Office. Retrieved from http://www2.ed.gov/rschstat/research/pubs/accountable/accountable.pdf

United States National Commission on Excellence in Education. (1983). *A nation at risk: The imperative for educational reform: A report to the nation and the Secretary of Education, United States Department of Education*. Washington, DC: The Commission.

White, J. N. (2001). *Socioeconomic, demographic, attitudinal and involvement factors associated with math achievement in elementary school* (Doctoral Dissertation). East Tennessee State, Johnson City, TN. Retrieved from http://dc.etsu.edu/etd/77

Wood, E. F. (1988). Math anxiety and elementary teachers: What does research tell us? *For the Learning of Mathematics*, *8*(1), 8–13.

Woolfolk Hoy, A., Hoy, W. K., & Kurz, N. (2008). Teacher's academic optimism: the development and test of a new construct. *Teaching and Teacher Education, 24*, 821–834.

Ysseldyke, J., Spicuzza, R., Kosciolek, S., & Boys, C. (2003). Effects of a learning information system on mathematics achievement and classroom structure. *The Journal of Educational Research*, *96*(3), 163–173.

CHAPTER 12

RACE TO THE TOP AND THE FUTURE OF FEDERAL EDUCATION POLICY

Sound Theory and Reflective Practice

Andrew Saultz

ABSTRACT

The Race to the Top (RT3) Program was an effort by the federal government to incentivize policy changes at the state level in exchange for the possibility of additional federal funds. This chapter explores how states and districts changed policy in response to RT3. The author uses national data on policy changes as well as interviews with senior level officials in four states to examine RT3. Finally, the chapter uses RT3 as an example of shift in federal strategy to hypothesize about the future of national policy.

Leadership and School Quality, pp. 215–233

INTRODUCTION

Race to the Top (RT3), the major federal education program under the Obama Administration, altered the dynamics between levels of government (Manna, 2011). As Secretary of Education Arne Duncan (2009) indicated on many occasions, RT3 shifted the historic emphasis of the federal government from compliance to incentives, and the results have been far-reaching policy changes at the state level. When announcing the program, Secretary Duncan remarked that the federal government for the first time, crossed an important threshold in education policy, and that the perfect storm of reform allowed the federal government to expand in ways it never had before. RT3 established a state grant program to encourage educational reform. In exchange for the possibility of significant federal dollars, states had to show evidence of, or the potential for, a series of educational policy initiatives. In order to qualify, states had to provide evidence that they were enacting specific reforms in the following areas: teacher evaluations, certification, compensation, measuring student growth, charter schools, Common Core State Standards, and school improvement (Learning Point Associates, 2010).

The American Recovery and Reinvestment Act (ARRA) was passed in 2009 as the major federal effort to improve the nation's economy during the Great Recession (Manna & Ryan, 2011). The total allocation for ARRA was $787 billion, and included the RT3 Program (McGuinn, 2012). The program was announced in the summer of 2009, and rolled out in three distinct rounds (Manna & Ryan, 2011). States were invited to apply, with the round one application due in January 2010 and round two applications due in June 2010 (McGuinn, 2012). Round three was unique, as only finalists in round two were invited to apply or not to RT3. In total, two states (Tennessee and Delaware) earned awards in round one, ten states won round two grants, and seven states won awards in round three (Manna & Ryan, 2011).

This study is not designed to explore the effectiveness of the various policy areas within RT3. Although researchers have explored educational standards (Schmidt & McNight, 1995), school accountability (Booher-Jennings, 2005; McEachin & Atteberry, 2014; McEachin & Polikoff, 2012; Saultz, forthcoming), teacher evaluations (Harris, 2011; Saultz, forthcoming), teacher compensation (Odden & Picus, 2008), and charter schools (Miron & Nelson, 2002; Zimmer et al., 2003), researchers have not explored how state and district officials reacted to RT3. As the major educational policy for the Obama Administration, and a new policy structure that places the emphasis on incentives, allowing states to determine if they want to participate, RT3 provides a unique and important opportunity to explore the current and future political dynamics of educational policy.

To shed light on the changing nature of educational policy and how state and district policymakers responded to RT3, this study examines RT3 on three levels. First, it looks at national trends in the various policy areas of RT3. Put simply, did states alter educational policies in the ways that the federal government incentivized? Second, how did districts implement new reforms? Lastly, based on the process of RT3, what should educational leaders at the state and district levels anticipate in the future from federal policy?

The organizational structure of this paper flows in much the same way as the study itself. First, background information and literature on federal educational policy and competitive grants provide context and framing for the work. Next, the methods section describes the logic of how and why the study was created, further outlines the research questions, summarizes the analyses, and proposes hypotheses. The data and results sections provide specific information on how state education officials viewed and interpreted RT3. The discussion provides space for analyses, organized by the three research questions. Finally, the conclusion section is reserved for comments about the future of federal policy and lessons that state and district leaders might consider moving forward.

Research Questions

The goal of this chapter is to explore three questions related to RT3. First, did states alter educational policies in the way that the federal government incentivized? In other words, what formal policy changes were created in the time following the announcement of RT3? Second, how did districts implement the new state reforms? Lastly, what should educational leaders at the state and district levels expect from federal policy in the future?

Hypotheses

Did states alter educational policies in the way that the federal government incentivized through RT3?

H1: The majority of states altered multiple major educational policies in response to RT3. Researchers, by and large, anticipated that states would alter policies to increase their chances of receiving federal funds.

How did districts implement the new policies related to RT3?

H2: There was a wide variance in the implementation of policies related to the RT3 state applications.

H3: Districts in states that did not receive funds are less likely to implement RT3 policies than districts in states that received funding.

What should educational leaders at the state and district levels expect from federal policy in the future?

H4: Federal policy will emphasize competitive funding in the future as a way of maximizing return on investment and creating broad, significant policy changes at the state level.

BACKGROUND

Federalism, a central component of the U.S. political system, is a broad term that refers to the tension between various levels of government (Gerston, 2007; Manna, 2007). Early support traces back to *The Federalist Papers*, where James Madison (1788) wrote, "The different governments will control each other, at the same time that each will be controlled by itself" (p. 320). The design of the federal system was intended to balance state and national interests and limit centralization of power in response to the British system (Lunch, 2001). Leaders of the American Revolution believed strongly that the centralization of power led to corruption and lack of citizen voice (Lunch, 2001). As a result, they wrote the 10th Amendment to limit the powers of the national government to only those specified in the Constitution; education is among those items left for states to decide (Cohen & Moffitt, 2009; Manna, 2007). The founders viewed federalism as a way to limit the consolidation of power by individuals or levels of government (Gerston, 2007; Madison, 1788; Manna, 2007). This philosophical belief in a federalist system remains fundamental to the national narrative and political ethos throughout the United States (Gerston, 2007).

When Horace Mann established the first common schools in the 1840s, local government controlled school funding and governance (Labaree, 2010; Reese, 2005). Since education was left out of the U.S. Constitution, the federal government did not challenge this development. "From the very beginning, control of the common schools was radically localized. Decisions about funding, hiring, and curriculum rested in the hands of the elected [or sometimes appointed] board of a local school district" (Labaree, 2010, p. 69). Education governance continued this way for over 100 years.

Beginning in the 1950s, the federal government increased involvement in education policy, mostly around issues related to equity and support for racial and ethnic minority groups (Reese, 2005). This marked the beginning of changing roles for the federal, state, and local governments in educational policy. Over the next 70 years, the federal government gradually increased its financial and political commitment to K–12 education (Labaree, 2010).

With the passage of the Elementary and Secondary Education Act (ESEA) in 1965, the federal government directly expanded its role in education policy (Reese, 2005). Albeit small relative to the total federal budget and total government expenditures on public education, and primarily focused on supplemental funds for programs targeting children living in poverty, the passage of the ESEA is viewed as the beginning of the federal government using funds to direct national education policy (Cohen & Moffitt, 2009). In this era, the federal government relied on setting broad guidelines that states and districts must meet in order to secure federal funding. Money was divided up between nearly every district nationally (Manna & Ryan, 2011). In exchange, districts were required to account for how the money was spent. However, districts were not required to show results for these programs beyond accounting and reporting how the money was spent (Cohen & Moffitt, 2009; Reese, 2005).

The federal role in education began to grow significantly during the 1990s and 2000s (Cohen & Moffitt, 2009). As American schools fell behind other developed nations on international comparisons, politicians at all levels of government passed legislation to improve student performance (Manna, 2011; Schmidt & McKnight, 1995). Because performance on these international comparisons was increasingly tied to economic productivity and global competition (National Commission on Excellence in Education, 1983), state and national leaders who previously had little to no role entered the educational policy arena (Ravitch, 2010; Zhao, 2009). In particular, presidents worked to expand the federal influence within educational policy through a series of unprecedented programs designed to improve schools (Cohen-Vogel & McLendon, 2009; Manna, 2007). President George W. Bush continued the momentum from the previous two administrations in an effort to further influence educational policy, mainly through the No Child Left Behind (NCLB) Act of 2001 (Sunderman & Kim, 2007). NCLB required states to test students annually, in grades three through eight, in reading and mathematics; allowed for more spending flexibility with Title I funds; and greatly expanded the amount of information that school districts were required to track and report (Jacobsen, Saultz, & Snyder, 2013a, 2013b; Manna, 2007). Major reporting requirements included more information about teacher characteristics, student performance on

standardized tests, and student demographics (Jacobsen et al., 2013a; Sunderman & Kim, 2007).

Race to the Top

Race to the Top represents the most recent shift in educational policy at the federal level, one from standard block grants to a competitive model. Although RT3 is not the first federal program aimed at influencing state and local education policy, it breaks from previous federal initiatives in important ways that have increased its influence and reach. These changes raise questions about the new balance between federal, state, and local governance in educational policy. There are four important ways that RT3 breaks from previous federal funding initiatives.

RT3 differs from previous federal programs by allocating funds to only a small, select number of states (Saultz, forthcoming). In the traditional political model, money is dispersed broadly to gain the support from a wide range of congressional districts (Kingdon, 1995; Lunch, 2001). RT3 rewarded a small number of states with a high percentage of the program funds (U.S. Department of Education [USDOE], 2010). This system, with clear winners and losers, established a highly stratified funding system. It is likely that this stratification may influence the relationship between the state and federal government moving forward (Saultz, forthcoming). Some evidence suggests that lower performance on national assessments was correlated with a lower chance of receiving RT3 funding in round one (Manna, 2011; McGuinn, 2012; Shelley, 2012). States that have had historically lower educational achievement relative to others may not cooperate with the federal government in the future if they continually fail to receive grant allocations.

Return on investment is another important component of RT3. The federal government's expectation of states that were awarded funds is that they would be able to produce extensive reports each year of the grant on the progress of the state's implementation plan (USDOE, 2010). The USDOE awarded grants for a period of four years, and noted that a state could lose funding if they did not demonstrate adequate progress in implementing their approved plan (USDOE, 2010).

RT3 also represents a shift from the traditional model of allocating funds for specific programs (block grants) toward a competitive model (Collins & Gerber, 2006). Although older policy initiatives such as IDEA and Title I continue to utilize the traditional model, which helps broaden the political appeal to gain momentum for a policy, a series of new programs have taken a different approach (Cohen & Moffitt, 2009). The RT3 competition does not allocate funds to all, or even a majority, of districts

and states that qualify. This has created not only a difference in federal funding between states, but clear winners and losers for each policy. RT3 moved away from mandating certain policies by allowing for state officials to decide on whether to apply to the competition or not. In other words, RT3 relied on incentivizing reform with a large sum of money ($4.35 billion) (Manna & Ryan, 2011).

Placed within the context of the Great Recession, RT3 provided the possibility of increased funds for education at a time when most states were facing large budget shortfalls (McGuinn, 2012). In Michigan, for example, the state economy contracted 2.9% in 2009, and another 0.7% in 2010 (Olson, Scorsone, & Zin, 2010). Forty-four states had budget shortfalls in either fiscal year 2009 or 2010 (Center on Budget Priorities, 2010). Forty states and the District of Columbia applied in Round 1 of RT3. The initial announcement of the competition did not specify the amount that each state would win, which left open the possibility of a state winning a large portion of the funds (USDOE, 2010). This turned out to be the reality, as Tennessee was awarded approximately $500 million in round one (Hamilton, 2010). In exchange for specific educational reform policies, states could receive substantial funds. Although these funds were not designed to backfill budget shortfalls at the state level, many state educational officials viewed RT3 as a way of offsetting state budget cuts (Shelley, 2012). RT3, then, presents a unique opportunity to explore how incentives influence the relationship between the state and federal level.

Some states were at a significant disadvantage to qualify for funds due to the breadth and timing of the application requirements (Nicholson-Crotty & Staley, 2012). Unlike previous federal programs that provided almost universal access to supplemental funds for all states in order to ensure compliance, RT3 placed some states—which had already begun the process of implementing reforms including statewide data systems, teacher evaluation systems, and/or merit pay—at a significant advantage (Wong, 2008). The new emphasis on competition and return on investment put a premium on capacity, or the existing structures and abilities for a state to implement specific reforms. Although capacity has always been important for program implementation and success, this structure favored states with higher capacity, like pre-existing statewide data systems, prior to the announcement of RT3 (Nicholson-Crotty & Staley, 2012). The federal government used policy leverage and momentum developed at the state level to advance similar reforms at the national level and gain legitimacy for their efforts (Manna, 2007). The short timeline for applications also led to difficulties for states with legislatures that did not meet full time. As a result, some states did not have an opportunity to pass laws directly related to increasing the probability of getting RT3 funds. For a complete list of areas included in RT3, see Table A1 in the Appendix.

Applications were reviewed by a group of academics, federal state department of education officials, and other policy experts, who used a 500-point rubric to score each application (McGuinn, 2012). Broad categories for scoring included great teachers and leaders, state success factors, standards and assessments, general selection criteria, turning around the lowest achieving schools, data systems to support instruction and the prioritization of STEM education (Manna & Ryan, 2011).

RT3 represents a major shift in the direction of educational policy at the federal level, yet there is limited knowledge about how state and district officials interpreted the competitive nature of the program and how policy shifted after the program's implementation. While researchers have examined what political factors influenced a state's probability of winning ab RT3 grant (Manna & Ryan, 2011) and how RT3 influenced teacher evaluation and preparation (Saultz, forthcoming). Others have analyzed the implementation of RT3 and have compared RT3 to previous reforms from the 1970s (Shelley, 2012; Venters, Hauptli, & Cohen-Vogel, 2012; Vergari, 2012). This study is designed to explore how states and districts changed policy as a result of RT3. Although it is difficult to isolate the RT3 effect statistically, general trends in policy changes do emerge in the data.

METHODS

Data

To explore the first research question (regarding whether states changed policy in ways that RT3 incentivized) most of the data were collected from publicly available sources. The federal government provides a thorough list of descriptive information regarding state participation in RT3 through the Department of Education website (USDOE, 2010). State RT3 applications were analyzed and coded for specific state policy changes. The applications were used for two reasons. First, this was a natural check on the USDOE data to ensure that the states had indeed altered policy in the ways that the federal government lists. Second, state application data served to draw the connection between RT3 and the specific policy adjustments.

Interviews were conducted with a broad range of decision makers at the state and district levels. These semi-structured interviews explored the influences on the decision to apply to RT3 at various time-points in the process. Interviews were designed to explore the financial, political, and policy costs and benefits of RT3, as well as the structure of the federal program.

The sampling strategy targeted a broad range of actors who have historically been heavily involved in policy decisions at the state or district

level. The initial list of interview targets were executive branch members in state government: the secretary of education (or equivalent), the governor, the chair of the education committee in the state house, the chair of the education committee in the state senate, members of the education committee in both the house and senate, the teachers union statewide president, the president of the statewide superintendents association, any name listed on the RT3 application, and any senior official at the state department of education (or the designees for the aforementioned positions). Initially, the structure of the state government helped identify the interview targets within each state. For example, whether the state superintendent was elected or appointed served as a proxy for the relationship with the governor's office. Recommendations for other important actors at the state or district level who were involved with implementing or deciding to pursue RT3 were accepted from interviewees.

Finally, data on the educational laws and policies that were approved at the state level in the time period between the first announcement of the RT3 program (July 1, 2009) and the application deadline for round two of RT3 (June 1, 2010) were analyzed. These analyses evaluated whether states changed their laws and/or policies outside of the RT3 application process.

Case Selection

This research was designed to analyze round two of RT3 to help understand how states may view the role of the federal government moving forward. Since the application process was voluntary, states self-selected into and out of the process following the results of round one (see Table A2 in the Appendix).

Focusing on round two applications has the added benefit of providing additional context and communication between the federal and state government from round one. Although most states applied in round one, state officials had few data suggesting how a grant program of this magnitude and design would play out (see Table A3 in the Appendix for a list of RT3 descriptive statistics). Since RT3 deviated from previous federal policy by having states compete for funds, many researchers assume that decision makers at the state and district levels gained and used knowledge from round one to inform their calculation on whether to alter policy in round two (McGuinn, 2012).

The goal of the interviews was not to seek statistical generalizability, but to complete an in-depth analysis of how these states navigated RT3. Using theoretical replication, the site selection was meant to identify states that are theoretically different (Yin, 1994). The four groups of states, based on application in rounds one and two, are: 30 states that applied in both

rounds (yes-yes states); 8 states that applied in round one, but chose not to apply in round two (yes-no states); 4 states that did not apply in round one, but chose to apply in round two (no-yes states); and 6 states that did not apply in either round (no-no states; see Table A3 in the Appendix for full descriptive statistics). For this study, one state from each group was selected. The purpose of this sampling was to explore whether states that made different decisions regarding application to RT3 focused on different factors. In other words, were states viewing RT3 in similar ways, or not? Although an in-depth study of all fifty states was not plausible, this design selected states that made different public decisions regarding RT3. During the selection process, it was unclear whether states had made the decision to apply (or not) due to differing interpretations of RT3. It is possible, for example, that the states viewed RT3 in a similar way, but made different decisions. Alternatively, focusing on different components of RT3 could have led states to make different decisions.

States that switched leadership in the governor's office were removed as possible research sites, due to the possibility of the different governors simply differing in their views of RT3. Using the same rationale, states that had continuity in the state superintendent's office were chosen over states that saw changes in leadership. Finally, states were filtered for cooperation and access to state policymakers and decision makers. The purpose of using these factors in the sampling strategy was to establish a diverse group of states that still had the same major players within educational policy.

Using the aforementioned criteria, Kentucky was selected as the state that applied in both rounds of RT3 (the yes-yes state). Idaho was selected from the yes-no states, as it too was one of the few states that had consistency at both major leadership positions. For similar reasons, the state that was selected that did not apply in round one, but chose to apply in round two was Washington (no-yes), while Texas (no-no) was chosen as the state that applied in neither round.

RESULTS

Did states alter educational policies in the way that the federal government incentivized through RT3?

The first research question explores whether states changed policies in ways that were incentivized by RT3. It is difficult to draw causal linkages to policy diffusion and changes, so the descriptive statistics provided are meant to show a general pattern of how state policy changed in the years following the passage of RT3. It is widely accepted in the literature that the pattern of changes, particularly around teacher evaluations, the Common Core State Standards (CCSS), and charter school reform immediately fol-

lowing RT3 demonstrates that states were paying attention and competing for funds (Manna & Ryan, 2011; McGuinn, 2012; Shelley, 2012). This section focuses on the policy surrounding teacher evaluation, the CCSS, and charter school caps because they are policies that can be easily categorized and are less subjective than some other components (like capacity or level of support for reforms) of the RT3 application.

Teacher evaluation reform was a central component of the RT3 rubric, which was embedded in the great teachers and leaders section. Many have argued that the policy landscape around teacher policy is changing rapidly (Harris, 2011; McGuinn, 2012; NCTQ, 2012). More specifically, teacher-evaluation policy has moved away from the classic version of principal observation only. From 2009-2012, 36 states and Washington DC changed teacher-evaluation policies, and 43 states now require annual evaluations (NCTQ, 2012).

The CCSS, although developed prior to the RT3 announcement, gained substantial momentum following RT3. Common core was a component of the assessment and standards section of the RT3 section. Currently, 43 states and the District of Columbia have adopted the CCSS (CCSS Initiative, 2014). One should not conclude that RT3 caused all of these policy changes, since the policy arena is complex. However, prior to the first announcements of RT3, no states had formally adopted the standards. Most of the states that did apply to RT3 included the CCSS in their application. Conversely, some states decided not to submit an RT3 application due to the CCSS. In Governor Perry's letter to the USDOE explaining why Texas would not participate, he noted, "In order to submit an application that is preferred … for Race to the Top, Texas would have to commit … to the adoption of national curriculum standards and tests" (Perry, 2010, para. 2). District and state policymakers repeatedly drew a very clear connection between the RT3 competition and the CCSS.

Charter school policy has been a politically contentious issue for many years. When discussing RT3, Secretary Duncan commented, "States that do not have public charter laws or put artificial caps on the growth of charter school jeopardize their applications under the Race to the Top fund" (Parker-Burgard, 2009). Prior to RT3, ten states did not have laws allowing charter schools, and 26 put caps on the number of public charter schools that were allowed in the state (USDOE, 2010). RT3 did lead to rapid changes within charter policy in a short time period. "Fifteen states took legislative action to remove charter caps in the year of the Race to the Top competition; six of these states won grants" (Bell, 2011). RT3 seemed to leverage state legislatures to move on charter school policy by expanding or eliminating caps.

How State Policymakers Discussed Policy Changes

States clearly changed policy in a number of areas following the announcement of RT3. This was a predictable response, particularly during the difficult economic times; however, interview data indicate that the changes were not in an attempt to get money. Instead, state policymakers emphasized a preexisting desire to create many of these changes, and used RT3 as a way of bringing others on board with the reforms. For example, state policymakers stressed the difficulty of teacher evaluation reform due to contract negotiations (Harris, 2011). More specifically, the tight application window allowed for tough conversations to happen quickly. Discussing the new evaluation policy, one state department of education official in Idaho stated, "I think those things probably would have happened but it would have been a longer term, probably 3–5, or even 7 years rather than just six months." This theme was repeated throughout the interviews, across states. Policymakers wanted to shift policy, but they were not confident they could accomplish these changes in the short-term. RT3, then, became a way to create desired changes relatively quickly.

How did districts implement the new policies related to RT3?

RT3 was designed as a way to incentivize rapid policy change. District administrators were left with trying to implement these shifts. Additionally, some states dictated specific timelines for districts, making it difficult to build capacity. For example, the CCSS has been an incredibly challenging issue for district administrators. Following the announcement of the RT3 winners, many states began to question whether they wanted to continue converting to the CCSS. For example, in Ohio, a strong movement emerged in the State House to change the state standards (Rice, 2014). Although the governor has stated that he continues to support the CCSS, districts are left in limbo, wondering which standards and tests will be used in the future.

Similarly, districts were left to implement changes to teacher evaluation policy quickly. According to one superintendent in a rural district in Idaho, the pace of change in teacher evaluations led to more teacher skepticism on the effects of the changes. Instead of allowing districts time to explain the changes and develop an extensive plan for implementation, they were forced to move to evaluating teachers on student test scores. However, other states, like Kentucky, refused to commit to rapid change. The commissioner of education stressed that he felt Kentucky was more realistic in their implementation plan, which may have cost the state points in RT3. Other states that scored higher on the teacher evaluation piece, according to this commissioner, promised rapid, dramatic change.

How District Leaders Discussed Policy Changes

District leaders had a more skeptical view of the policy agenda of RT3. They focused on the competitive nature of the grants, stating that it incentivized states to promise reform too quickly. This was the case particularly with teacher evaluation reform, which district leaders in Kentucky stressed required time to build trust and buy-in from teachers. District officials in Idaho, Washington, and Kentucky all mentioned how unrealistic they viewed Tennessee's plan for evaluation reform. Although some might consider these comments to be hard feelings over losing the competition to Tennessee, the general view was that states with more ambitious, and perhaps haphazard, plans were the ones that ended up be awarded RT3 funds (McGuinn, 2012; Ravitch, 2014).

DISCUSSION

What should educational leaders at the state and district levels expect from federal policy in the future?

RT3 has many lessons for educational leaders. Although some argue that RT3 was a one-time policy that took advantage of a struggling national economy to push through changes in educational policy (Ravitch, 2014), there are signs that this type of policy will continue to be used in the future. For example, at the national level, there have been additional educational 'competitions' for districts, schools, and state pre-K plans (Ravitch, 2014). States, too, have utilized the competitive design to incentivize change and reward certain policies. In Ohio, for example, the Straight A Fund awarded grants to districts for improving technology and creating plans for innovative instruction (Rice, 2014). This statewide program resembles many of the features of RT3 at the state level, including a competitive application process and incentivizing science, technology, engineering, and math (STEM) reforms (Ravitch, 2014).

As educational policymakers continue to look toward competition between states and districts, a tension emerges between the pace of policy change and the fidelity of policy implementation. A common critique of RT3 from leaders of state policy was that the competition incentivized unrealistic plans. In other words, the states that promised the most dramatic changes in the quickest fashion were rewarded. Instead of rewarding quality implementation, states were rewarded for persuasive promises of change. While states chased money, district leaders were left with grandiose plans created in haste.

CONCLUSION

If the goal of the federal government is to create policy changes quickly, RT3 was a success. The majority of states altered policy surrounding teacher evaluations, caps on charter schools, and CCSS. RT3 was able to leverage a small amount of money and a short policy window to shift policy areas that are historically very contentious. However, two things are not clear. First, there is debate about whether any of these policy shifts will actually improve education. Limited empirical work has explored areas of RT3, but there is no thorough analysis of the federal program as a whole.

The second thing that is unclear is whether or not these policies will have staying power in states that did not receive funds. With previous reforms, the federal government was able to mandate certain practices due to annual resource allocations. Most states will never see any additional funds from RT3. If policies were passed as a way of gaining revenue, and that money never came through, there is a worry that some states may roll back the policies. The CCSS, for example, has seen substantial pushback by citizens and policymakers at the state level. It will be interesting to see how state policymakers balance commitments to the federal government within the unfunded RT3 applications with citizen resistance to various policy areas.

REFERENCES

Bell, J. D. (2011, December). Charter school caps. *National Council of State Legislatures*. Retrieved September 17, 2014, from http://www.ncsl.org/documents/educ/CharterSchoolCaps.pdf

Booher-Jennings, J. (2005). Below the bubble: Educational Triage and the Texas accountability system. *American Educational Research Journal, 42*, 231–268.

Center on Budget Priorities. (2010). Retrieved June 21, 2012 from http://www.mybudget360.com/fiscal-situation-of-50-states-combined-budget-gaps-estimated-at-350-billon-for-2010-and-2011/

Cohen, D. K., & Moffitt, S. L. (2009). *The ordeal of equality*. Cambridge, MA: Harvard University Press.

Cohen-Vogel, L., & McLendon, M. K. (2009). New approaches to understanding federal involvement in education. In G. Sykes, B. Schneider & D. Plank (Eds.), *Handbook of education policy research* (pp. 735–748). New York, NY: Routledge.

Collins, B. K., & Gerber, B. J. (2006). Redistributive policy and devolution: Is state administration a road block (grant) to equitable access to federal funds? *Journal of Public Administration Research and Theory, 16*, 613–632.

Common Core State Standards Initiative (2014). Development process. Retrieved from September 11, 2014, from http://www.corestandards.org/about-the-standards/development-process/

Duncan, A. (2009, July 24). The race to the top begins. Retrieved July 2, 2012, from http://www.ed.gov/news/speeches/race-top-begins

Gerston, L. N. (2007). *American Federalism: A concise introduction*. New York, NY: M.E. Sharpe.

Jacobsen, R., Saultz, A., & Snyder, J. W. (2013a). When accountability strategies collide: Do policy changes that raise accountability standards also erode public satisfaction? *Educational Policy*, *27*(2), 360–389.

Jacobsen, R., Saultz, A., & Snyder, J. W. (2013b, October 95). Grading school report cards: Issues for future research and practice. *Phi Delta Kappan*, *2*, 64–67.

Kingdon, J. W. (1995). *Agendas, alternatives, and public policies* (2nd ed.). New York, NY: HarperCollins.

Hamilton, J. (2010, March 29). Delaware and Tennessee win first race to the top grants. Department of Education, archived information. Retrieved July 11, 2012, from http://www2.ed.gov/news/pressreleases/2010/03/03292010.html

Harris, D. N. (2011). *Value-added measures in education.* Cambridge, MA: Harvard University Press.

Labaree, D. F. (2010) *Someone has to fail*. Cambridge, MA: Harvard University Press.

Learning Point Associates. (2010). *State legislation: Emerging trends reflected in the state phase 1 race to the top applications*. Chicago, IL: Author.

Lunch, W. (2001). *Inside the beltway.* Corvallis, OR: Oregon State University Press.

Madison, J. (1788). No. 51: The structure of the government much furnish the proper checks and balances between the different departments. In *The federalist papers.* New York, NY: McLean.

Manna, P. (2007). *School's in: Federalism and the national education agenda*. Washington, DC: Georgetown University Press.

Manna, P. (2011). *Collision course: federal education policy meets state and local realities.* Washington, DC: CQ Press.

Manna, P., & Ryan, L. L. (2011). Competitive grants and educational federalism: President Obama's race to the top program in theory and practice. *Pubius: The Journal of Federalism*, *41*(3), 522–546.

McEachin, A., & Atteberry, A. (2014). *The impact of summer learning loss on measures of school performance* (No. 26). EdPolicyWorks Working Paper Series.

McEachin, A., & Polikoff, M. (2012). We are the 5%: Which schools would be held accountable under a proposed revision of the Elementary and Secondary Education Act? *Educational Researcher, 41*(7), 243–251.

McGuinn, P. (2012). Stimulating reform: Race to the top, competitive grants and the Obama education agenda. *Educational Policy*, *26*(1), 136–159.

Miron, G., & Nelson, C. (2002). *What's public about charter schools? Lessons learned about choice and accountability*. Thousand Oaks, CA: Corwin Press.

National Commission on Excellence in Education. (1983). A nation at risk: The imperative for educational reform. *The Elementary School Journal,* 113–130.

Nicholson-Crotty, S., & Staley, T. (2012). Competitive federalism and race to the top application decision in the American states. *Educational Policy*, *26*(1), 160–184.

Odden, A. R., & Picus, L. O. (2008). *School finance: A policy perspective* (4th ed.). New York City, NY: McGraw-Hill.

Olson, G., Scorsone, E., & Zin, D., (2010). Michigan's economic outlook and budget review: FY 2009–2010 and FY 2010–2011. Senate Fiscal Agency. Retrieved from http://www.senate.michigan.gov/sfa/Publications/BudUpdates/EconomicOutlook May10.pdf

Parker-Burgard, D. (2009). Limits on charter schools an obstacle to race to the top funds. District Adminstration. Retrieved from http://www.districtadministration.com/article/limits-charter-schools-obstacle-race-top-funds

Perry, R. (2010). *Letter to the Honorable Arne Duncan*, Office of the Governor, Retrieved from http://governor.state.tx.us/files/press-office/O-DuncanArne201001130344.pdf

Ravitch, D. (2010). *The death and life of the great American school system*. New York, NY: Basic Books.

Ravitch, D. (2014). *The reign of error: The hoax of the privatization movement and the danger to America's public schools.* New York, NY: Vintage Books.

Reese, W. J. (2005). *America's public schools: From the common school to "No Child Left Behind".* Baltimore, MD: Johns Hopkins University Press.

Rice, B. (2014). *Straight a fund's governing board makes final grant recommendations. State Impact*. Retrieved from http://stateimpact.npr.org/ohio/2014/06/23/straight-a-funds-governorning-board-makes-final-grant-recommendations/

Saultz, A. (forthcoming). How states respond to federal policy: Principal preparation, evaluation and race to the top. *Journal for Research in Leadership Education.*

Saultz, A. (forthcoming). Fourth time is the charm: Charter school policy and the influence of the elite in Washington state. *Peabody Journal of Education.*

Schmidt, W. H., & McKnight, C. C. (1995). Surveying educational opportunity in mathematics and science: An international perspective. *Educational Evaluation and Policy Analysis, 17*(3), 337–353.

Shelley, B. (2012). Flexible response: Executive federalism and the no child left behind act of 2001. *Educational Policy*, *26*(1), 117–135.

Sunderman G. L., & Kim, J. S. (2007). The expansion of federal power implementing the no child left behind act. *Teachers College Record*, *109*, 1057–1085.

U.S. Department of Education. (2010). Delaware and Tennessee win first Race to the Top grants [Press release]. Retrieved from http://www2.ed.gov/news/pressreleases/2010/03/03292010.html

Venters, M., Hauptli, M. V., & Cohen-Vogel, L. (2012). Federal solutions to school fiscal crisis: Lessons from failed national sales tax for education. *Education Policy 26*(1), 35–57.

Vergari, S. (2012). The limits of federal activism in education policy. *Educational Policy*, *26*, 15–34.

Zhao, Y. (2009). *Catching up or leading the way.* Alexandria, VA: ASCD.

Zimmer, R., Buddin, R., Chau, D., Daley, G., Gill, B., Hamilton, … Brewer, D. J. (2003). *Charter school operations and performance: Evidence from California.* Santa Monica, CA: Rand Corporation.

Yin, R. K. (1994). *Case study research: Design and methods.* London, England: Sage.

Wong, K. K. (2008). Federalism revisited: the promise and challenge of the no child left behind act. *Public Administration Review*, *68*, S175–S185.

APPENDIX

Table A1. Race to the Top Criteria for Evaluating Applications

Category	*Number of Points*
Great Teachers and Leaders	**138**
Improving teacher and principal effectiveness based on performance	58
Equitable distribution of teachers and principals	25
Providing high-quality pathways for aspiring teachers and principals	21
Providing effective support to teachers and principals	14
State Success Factors	**125**
Articulating state's education reform agenda and LEA's part	65
Building strong statewide capacity to implement, scale up, and sustain proposed plans	30
Demonstrating significant progress in raising achievement and closing gaps	30
Standards and Assessments	**70**
Developing and adopting common standards	40
Standards and Assessments	**70**
Supporting transition to enhanced standards and high-quality assessments	20
Developing and implementing common, high-quality assessments	10
General Selection Criteria	**55**
Ensuring successful conditions for high performing charters/innovative schools	40
Making education funding a priority	10
Demonstrating other significant reform conditions	5
Turning Around the Lowest Achieving Schools	**50**
Turning around the lowest achieving schools	40
Intervening in the lowest achieving schools and LEAs	10
Data Systems to Support Instruction	**47**
Fully implement statewide longitudinal data system	24
Using data to improve instruction	18
Accessing and using state data	5
Prioritization of STEM Education	**15**
TOTAL	**500**

Table A2. State RT3 Designation

	Applied in Round 1 and 2	Applied in Round 1 only	Applied in Round 2 only	Did not apply either round
States	AL, AZ, AR, CA, CO, CN, DC, FL, GA, HA, IL, IA, KY, LA, MA, MI, MO, NE, NH, NJ, NM, NY, CN, OH, OK, PA, RI, SC, UT, WI	ID, IN, KS, MN, OR, SD, VA, WV, WY	MD, ME, NV, WA	AK, ME, MS, ND, TX, VE
Number of states	30	9	4	6
*TN and DE excluded as winners of round 1. Total n= 51 (50 states plus Washington, D.C.)				

Table A3. State RT3 Designation: Descriptive Statistics

Round 1 (Applications due January 19, 2010; Winners announced March 4, 2010)

Applied–41

Did not apply–10

Applied nonfinalist–24

Applied finalist–17

Applied won–2

R2 (Applications due June 1, 2010; Winners announced August 24, 2010)

Total Applied–34

Total Did not apply (excluding previous winners)–15

Applied R2, did not apply R1–4

Applied finalist R2, applied R1–30

Applied finalist R2, finalist R1–14 (Colorado, Washington DC, Florida, Georgia, Illinois, Kentucky, Louisiana, Massachusetts, New York, North Carolina, Ohio, Pennsylvania, Rhode Island, and South Carolina)

Applied finalist R2, did not apply R1–1

Applied won R2, finalist R1–8

Applied won R2, applied not finalist R1–1

Applied won R2, did not apply R1–1

(*Appendix A continues on next page*)

Table A3. (Continued)

Applied nonfinalist R2, did not apply R1–3
Applied nonfinalist R2, finalist R1–0
Applied nonfinalist R2, applied nonfinalist R1–12 (Alabama, Arkansas, Connecticut, Iowa, Michigan, Missouri, Nebraska, New Hampshire, New Mexico, Oklahoma, Utah, Wisconsin)
Applied finalist R2, applied non-finalist R1–4
Did not apply R2, did not apply R1–6
Did not apply R2, applied R1–8 (Idaho, Indiana, Minnesota, Oregon, South Dakota, Virginia, West Virginia, Wyoming)
Did not apply, finalist R1–2

*bold indicates a proposed group for one state selection

ABOUT THE EDITORS/AUTHORS

THE EDITORS

Michael F. DiPaola is chancellor professor and department chair of the Educational Policy, Planning, and Leadership Program at The College of William and Mary. His research interests include the interactions of professionals in school organizations, organizational citizenship, leadership, and formative assessment. His second text with coauthor Wayne Hoy, *Improving Instruction: Supervision, Evaluation, and Professional Development,* is focused on instructional improvement.

Wayne K. Hoy is professor emeritus at The Ohio State University. He is the author or coauthor of a dozen of books on administrative and leadership practices in education. His latest book, with Michael DiPaola, is *Improving Instruction Through Supervision, Evaluation, and Professional Development* (2014).

ABOUT THE AUTHORS

Lauren Bailes is a doctoral candidate at The Ohio State University. She studies the interaction of organizations and their characteristics with political and school systems. Prior to her doctoral work, she taught middle school in Brooklyn, New York, and studied at Teachers College, Columbia University.

Thomas Beatty is an assistant professor in the Department of Educational Leadership at Virginia Commonwealth University. He works with students to translate educational theory into practice so they are prepared for real-world challenges in their schools and educational settings. Prior to coming to VCU, he worked as a teacher, assistant principal, principal, and central office administrator in an urban school district. His primary focus is improving the quality of education and opportunities for children in urban schools.

Alan J. Daly is chair and professor of the Department of Education Studies at the University of California, San Diego. His research and teaching primarily focus on the role of leadership, educational policy, and organization structures, and the relationship between those elements on the educational attainment of traditionally marginalized populations. Alan draws on his methodological expertise in social network analysis in his work and has a book on the topic, *Social Network Theory and Educational Change*.

Mary Lynne Derrington is an assistant professor in the Department of Educational Leadership and Policy Studies at the University of Tennessee, Knoxville. A former school superintendent, her research focuses on the study of principal and district leadership in the implementation of a mandated teacher evaluation policy.

David L Dixon is currently a manager of teacher development and curriculum management in the College of Continuing Studies at the University of Alabama. His career in public school education as a teacher and school administrator spanned 26 years. He also serves as an adjunct professor at the University of West Florida.

Leslie W. Grant is assistant professor of educational leadership at the College of William and Mary. She teaches courses in educational planning, assessment for educational leaders, and program evaluation. Her publications include journal articles, chapters in books, and books related to building teachers' and educational leaders' assessment literacy,

international comparisons of teachers and student achievement, and effective teaching practices.

Julie Gray is a tenure-track assistant professor of educational leadership at the University of West Florida. Her research interests include professional learning communities, trust, enabling school structures, collective efficacy, and academic optimism.

Sara Rimm-Kaufman, associate professor of education at the Curry School of Education at the University of Virginia, conducts research on classroom social processes and their influence on children's social and academic growth in elementary school. She directs the doctoral program in educational psychology and applied developmental science and the University of Virginia Social Development Laboratory. E-mail: serk@virginia.edu

W. Sean Kearney is associate professor of educational leadership at Texas A&M University–San Antonio. He has research interests in principal influence, change orientations, school culture and climate, and the confluence of administration, ethics, and emotionally intelligent leadership.

Ross Larsen is an assistant professor at Brigham Young University at the Instructional Psychology and Technology Department in the McKay School of Education. His research focuses on quantitative methodology and their applications in social science. Larsen earned his PhD from Texas A&M in educational psychology with a focus on research design and psychometric measurement.

David Lomascolo is a PhD candidate in the Department of Educational Leadership and Policy Studies at the University of Tennessee, Knoxville. His dissertation examines the effects of teacher tenure policies under Race to the Top.

Brenda Mendiola is a clinical assistant professor of educational leadership at The University of Alabama in the Department of Educational Leadership, Policy, and Technology Studies. Her research interests are in the areas of school leadership and instructional improvement, school finance, and leadership training.

Roxanne M. Mitchell is Associate professor of educational administration at The University of Alabama in the Department of Educational Leadership, Policy, and Technology Studies. Her research focuses on educational leadership, organizational theory, and school culture. Her work has

appeared in leading journals such as *Educational Administration Quarterly*, *Journal of Educational Administration*, and the *Journal of School Leadership*.

Nienke M. Moolenaar is a faculty member at the Department of Education at Utrecht University, The Netherlands. Her work focuses on the coevolution of social networks and educational change. Her research aims to understand how educators' social networks change during educational reform and how this network change supports and constrains school improvement in terms of teachers' instructional practice and student achievement.

Andrew Saultz is an assistant professor of educational leadership at Miami University. His research foci are public opinion, the politics of education, and federal educational policy. He taught high school social studies, served on a local school board, and graduated from Michigan State University with a degree in educational policy.

Jing-Ping Sun is assistant professor in the Department of Educational Leadership, Policy and Technology Studies in the College of Education, University of Alabama. Her research is about educational leadership, policy evaluation and improvement, data-based decision making, and research synthesis. Prior to joining the faculty at the University of Alabama, she worked at the Ontario Ministry of Education in Canada.

C. John Tarter is professor of educational administration at The University of Alabama. His research interests include organizational theory, decision making, and research methodology. He recently published the third edition of *Administrators Solving the Problems of Practice: Decision-Making Concepts, Cases, and Consequences* (with Wayne Hoy), as well as articles in such journals as *Educational Administration Quarterly* and *Journal of Educational Administration*.

Dimitri Van Maele is a postdoctoral researcher at the Department of Sociology at Ghent University, Belgium. He conducts research within the field of educational leadership and administration, with a primary focus on trust and organizational culture. He has a book, together with P. B. Forsyth and M. Van Houtte, published by Springer, titled *Trust and School Life*. He currently coordinates an interuniversity research project that deals with the gender gap in secondary education.

Charles A. Wagner is currently an assistant superintendent for instruction with Gloucester County Public Schools in Virginia. He serves as a leadership team member for the SURN Principal Academy and has previously

served as a high school principal, assistant principal, and science teacher during his 20-year tenure in public education.

Kristi E. Wagner is a senior research associate with Shaffer Evaluation Group. Her work with the SURN Principal Academy was part of her doctoral studies at the College of William & Mary. Before becoming a program evaluator, she spent 18 years in public education as a district science coordinator and high school science teacher.

Shannon Wanless is an assistant professor in the School of Education at University of Pittsburgh. Her research focuses on the influence of teaching on children's development. Wanless received her doctorate at Oregon State University and did her postdoctoral training at the University of Virginia.

Sijia Zhang is a graduate research assistant and PhD student in K–12 administration at The University of Alabama in the Department of Educational Leadership, Policy, and Technology Studies. Her research interest focuses on school effectiveness, particularly as it relates to ESL students.

Leadership and School Quality is the 12th in a series on research and theory dedicated to advancing our understanding of schools through empirical study and theoretical analysis. Hence, the chapters include analyses that investigate relationships between school organizations and leadership behaviors that have an impact on teacher and school effectiveness.

IAP–Information Age Publishing
P.O. Box 79049
Charlotte, NC 28271-7047
www.infoagepub.com

ISBN 978-1-68123-040-5
90000
9 781681 230405