

How does leadership affect student achievement?¹ Results from a national US survey

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Using survey responses from a national sample of US teachers, this paper provides insight into 2 questions: (1) Do 3 specific attributes of leadership behavior – the sharing of leadership with teachers, the development of trust relationships among professionals, and the provision of support for instructional improvement – affect teachers' work with each other and their classroom practices? and (2) Do the behaviors of school leaders contribute to student achievement? We tie this investigation of school leader behaviors to 2 additional factors that have also received increasing attention in research because they have been shown to be related to student achievement: professional community and the quality of classroom instruction. Our analysis provides an empirical test of the notion that leadership variables are positively related to student learning. It also suggests that both shared and instructionally focused leadership are complementary approaches for improving schools.

Keywords: leadership; trust; instruction; student achievement

Introduction

There is increasing evidence that leadership makes a difference in schools. A few scholars have made sustained contributions to the question of how formal leadership from principals affects a variety of school outcomes (see Hallinger, 2003; Hallinger & Heck, 1998; Heck & Hallinger, 2009; Leithwood & Jantzi, 1999, 2000, 2005), but many others have contributed to the accumulation of evidence that principals do, in fact, make a difference.

Most of the syntheses summarizing this research have produced relatively long lists of leadership behaviors that make a difference. Perhaps the most widely cited is the review by Marzano and his colleagues (Marzano, Waters, & McNulty, 2005), but others have weighed in with their own set of principles (Day et al., 2009; Leithwood, Harris, & Hopkins, 2008). One problem facing the syntheses, however, is that the research studies typically examine a limited range of leadership behaviors, thus making comparisons across studies difficult. Another is that they often assume that leadership affects students because it changes teacher behavior, but relatively few studies look at the connection between leadership and instructional practices.

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This paper investigates three different school leader behaviors that have been under the microscope in recent studies: instructional leadership (which focuses on improving classroom pedagogy), shared leadership (which emphasizes the engagement of leaders at many levels), and trust (which focuses on the importance of emotions and emotional intelligence in motivating high performance), and connects them to student achievement through their impact on teachers' work.

Framework

Our investigation is premised on the assumption that the school leader's effects on students are almost entirely indirect (Day et al., 2009; Witziers, Bosker, & Kruger, 2003). What we know from the long line of school effectiveness research is that instruction and classroom environments have the greatest impact on student learning, although there are still debates about what kinds of instruction are most efficacious in increasing student learning (Cohen, Raudenbush, & Ball, 2003). Teacher characteristics, such as type of degree or certification, also have limited effects (Wayne & Youngs, 2003), and those characteristics are largely indirect through their impact on instruction (Smith, Desimone, & Ueno, 2005). In other words, an examination of instruction must be at the heart of the question of how leadership contributes to student learning (Wahlstrom & Louis, 2008).

Starting with instruction

Models of good instruction have evolved over the last several decades, but differences among them remain only partially resolved. An early review of US research (Brophy, 1986) found that certain behaviors of teachers, such as using academic objectives to establish learning expectations, effective classroom management strategies, and differentiated pacing of instruction based on both the content and the characteristics of the learners, were consistently associated with student achievement. From the late 1980s into the early 2000s, the emphasis shifted toward inquiry-based instructional models, in which the teacher's most important role was in designing lessons or learning experiences that involved guiding students toward new understanding through exploration and induction (Wiske, 1998). While some approaches to constructivism emphasized modest roles for teachers (guides on the side), others gave teachers clear responsibilities for being good in their traditional roles but also for organizing learning environments that develop students' sense of responsibility for their own learning (Fenstermacher & Richardson, 2005).

While researchers rarely talk about mechanical "time on task" anymore, there is still accumulating evidence that teacher's efforts to control the timing and pacing of work in classrooms is important for student learning (Allington, 2001; Knapp, 1995; Taylor, Pearson, Clark, & Walpole, 2000), at least when it is carried out in the context of using rich materials and stimuli. Recent reviews have begun to re-emphasize the role of the teacher in directing student learning (Kirschner, Sweller, & Clark, 2006).

A particular problem is that the most valuable research strategies for observing instruction in widely varying settings (different disciplines, different grade levels) are short on details to guide teacher choices (see, e.g., Newmann & Associates, 1996). Measuring the complexity of classroom instruction is very difficult. As Cohen et al. (2003) note, this is because teachers and students are independent and idiosyncratic

actors. What happens instructionally in a given situation is context specific, making generalizations about reform efforts, such as role of shared leadership or teachers' professional community, difficult to confirm. Added to this incomplete picture, however, is the limited amount of research that directly links policies and practices of leaders at the school level to high quality instruction in the classroom, whether teacher directed or teacher guided.

In a previous paper (Wahlstrom & Louis, 2008), we used factor analysis to demonstrate that teachers report a distinctive style of teaching that incorporates both direct influence over the pacing and content of classroom work and opportunities for students to take charge of their own learning and construct their own knowledge, a type of teaching that we called "focused instruction". In our view, if we overlook teacher educator debates (Wilson & Peterson, 2006), our finding that "real teachers" combine elements of a traditional teacher-centered model with practices that emphasize constructivist models in which students are led to figure out the meaning of the task for themselves is consistent with other research on instructional approaches that are linked to student achievement (Newmann & Associates, 1996).

Instructional leadership

As Hallinger notes in a recent review of the literature, *instructional leadership* is an idea that refuses to go away, although it has been poorly defined since it was first introduced in the 1970s (Hallinger, 2005). In the building, the formal school leader is expected to understand the tenets of quality instruction, as well as have sufficient knowledge of the curriculum to know that appropriate content is being delivered to all students (Marzano et al., 2005). This presumes that he or she is capable of providing constructive feedback to improve teaching or is able to design a system in which others provide this support. Research suggests that there is increasing pressure on school leaders to "deliver" (or at least promote) better support instruction, and that consistent and knowledgeable support from them makes a difference (Hallinger, 2005; Mosenthal, Lipson, Torncello, Russ, & Mekkelsen, 2004). Formal school leaders who have support in becoming instructional leaders (e.g., through professional development) are more likely to do so consistently (Camburn, Rowan, & Taylor, 2003).

While some scholars emphasize the importance of principals' deep understanding of curricular content and instructional materials (Stein & Nelson, 2003), others pay more attention to principals' support for improved instruction (Leithwood, 2001; O'Donnell & White, 2005). Typically those who emphasize the importance of deep content knowledge study elementary schools (e.g., Burch & Spillane, 2003), but even in elementary schools the principal's ability to draw on effective interactional styles and supportive approach may be more important than their specific content knowledge (Spillane, Hallett, & Diamond, 2003). Secondary principals cannot be expected to provide substantive support to the multiple disciplines that are taught in middle and high schools. Thus, many of the studies of instructional leadership in secondary schools emphasize the development of improved learning environments for teachers, focusing on the ability of principals to stimulate teachers' innovative behaviors rather than on their direct support (Halverson, Grigg, Prichett, & Thomas, 2007; Silins & Mulford, 2004). Because our study includes secondary schools (where principals cannot be expected to be content experts in all

subjects), we choose to emphasize supportive behaviors as well as direct coaching or modeling.

Shared leadership

For over 3 decades, reform proposals in many countries have recommended the inclusion of teachers in leadership roles. In the late 1980s and early 1990s, efforts to promote school-based management often included formal representation of teachers in decision making – although many investigations report weak implementation (Anderson, 1998; Malen, 1994). Recent policy discussions in the USA and elsewhere suggest there is broad support for expanding teachers' participation in leadership and decision-making tasks. These discussions are supported by research suggesting that increased teacher influence in schools has the potential for significant positive effects on school improvement (Huber, 2004; Leithwood & Beatty, 2007; Leithwood et al., 2008; Matthews & Sammons, 2005; Riley & McBeath, 2003).

Still, what constitutes and promotes the sharing of leadership in a school is more ambiguous. Distributed leadership, another term that is often used interchangeably with shared leadership, is usually thought of as the network of both formal and informal influential relationships in a school. Shared leadership, on the other hand, is typically investigated as an organizational property that reflects deliberate patterns of commitment and mutual influence among organizational members (although not necessarily reflected in formal position descriptions or an organization chart).² In this paper, we are focused on deliberate organizational behaviors. It is important to emphasize, however, that a distinction between shared and distributed leadership is far from clear in the existing literature.

Shared leadership may have its greatest impact by reducing teacher isolation and increasing commitment to the common good (Pounder, 1999). Experiencing influence and feedback in the context of important professional discussions is an important ingredient that encourages a focus on shared practices and goals (Chrispeels, Castillo, & Brown, 2000; Marks & Printy, 2003) and may promote organizational innovation (Harris, 2008; Printy & Marks, 2006). On the other hand, research to date suggests that involvement in formal decision making or leadership roles may have limited impact on student achievement (Leithwood & Jantzi, 1999; Marks & Louis, 1997; Smylie, Conley, & Marks, 2002) For purposes of this paper, shared leadership is defined as teachers' influence over and participation in school-wide decisions.³

Trust

Organizational trust has also been a staple of organizational research for some time. An early study found that trust in the decision-making capacity of the organization's leadership predicted overall satisfaction with the organization better than did employee participation in decision making (Driscoll, 1978). More recently, an examination of changes in work team trust found that perceived ability of colleagues was a strong predictor of trust, and that trust was a significant predictor for risk-taking behaviors (Serva, Fuller, & Mayer, 2005).

Within the past 2 decades, studies of trust as a factor in school improvement have begun to illuminate the actions that leaders take which positively alter the culture in a school (Bryk & Schneider, 2002; Louis, 2007; Tarter, Bliss, & Hoy, 1989;

Tschannen-Moran, 2004). Tarter et al. found that supportive principal behavior and faculty trust were significantly correlated in their sample of secondary schools, and that schools with higher levels of engaged teachers (including commitment to students) had higher levels of trust in colleagues. The study implies that principals can build trust indirectly through supportive behavior, but they cannot make teachers trust one another through direct action. Similarly, Bryk and Schneider's study of Chicago elementary schools found that principal respect and personal regard for teachers, competence in core role responsibilities, and personal integrity were associated with relational trust among all adult members of the school. Louis identified similar principal behaviors that affect trust and also linked trust to shared leadership. High trust schools exhibited more collective decision making, with a greater likelihood that reform initiatives were widespread and with demonstrated improvements in student learning. Tschannen-Moran also outlines key leadership behaviors and specific actions that engender trust. For example, "Competence" is enacted by "engaging in problem solving, setting standards, buffering teachers, pressing for results" (p. 34). More recently, trust has been shown to be a predictor of how educators interpret their superior's ability to carry out more technical and transformational leadership functions (Daly & Chrispeels, 2008).

Embedded in the notion of trust is the key distinction between the "trustee" and the "trustor" or, said another way, those having more or less power (or dependence) in a particular situation (Driscoll, 1978). Teachers' views of trustworthy principals tend to be based upon the leadership characteristics outlined above. However, we have less information about why principals do or do not trust their teachers.

Teacher leadership and professional community

While we have focused thus far on shared leadership and principal-teacher trust, teacher-teacher relationships are even more important as a foundation for the way in which teachers work to improve instruction (Louis, 2006) and are also affected by principal leader behavior (Wiley, 2001). Here, we emphasize the importance of professional community, largely because of the accumulating evidence that it is related both to improved instruction and to student achievement (King & Newmann, 2001; Louis & Marks, 1998; Smylie & Wenzel, 2003) and its ties to one of our leadership variables (shared leadership) (Scribner, Sawyer, Watson, & Myers, 2007; York-Barr & Duke, 2004).

York-Barr and Duke (2004) view professional community as a vehicle for the exercise of teacher leadership, a perspective that we adopt in this paper. Supportive interactions among teachers in school-wide professional communities enable them to assume various roles with one another as mentor, mentee, coach, specialist, advisor, facilitator, et cetera. However, professional community is more than just support and includes shared values, a common focus on student learning, collaboration in the development of curriculum and instruction, and the purposeful sharing of practices – all of which may be thought of as distributed leadership (Hord & Sommers, 2008; McLaughlin & Talbert, 2001).

The findings of the several studies cited above suggest that, when the focus of the professional community is on the quality of student learning, teachers adopt instructional practices that enhance students' learning opportunities. While many factors affect whether or not professional community exists in a school, one of the most significant factors is strong principal leadership (Bryk, Camburn, & Louis,

1999; Louis & Marks, 1998; Wiley, 2001; Youngs, 2001; Youngs & King, 2002). Professional community is closely associated with organizational learning, and the term “professional learning communities” has become a common short hand among practitioners. Thus, the presence of professional community appears to foster collective learning of new practices – when there is principal leadership (Marks, Louis, & Printy, 2002).

School level

Many characteristics of schools may moderate leadership effects. In this paper, we choose to focus on the potential differences between elementary and secondary schools. Frequently cited investigations of leadership effects on teachers and students are most often carried out using only one type of school (Bryk & Schneider, 2002; Cascadden, 1998; Friedkin & Slater, 1994; Goddard, Sweetland, & Hoy, 2000; Harris, 2002). Those that use samples from all levels, such as Marks and Printy (2003), are based on a small number of cases, while those with a larger number of schools are often a convenience sample drawn from a single district (Leech & Fulton, 2008; Leithwood & Jantzi, 2000). Nevertheless, as noted above in our discussion of instructional leadership, there is reason to anticipate that leadership practices and their effects may be different in elementary and secondary schools because of size and organization. The school leader in a very large school simply does not have the time to work directly with all teachers, while the complexity of departmental organization seems to limit influence. As Harris (2002) points out, secondary leaders seem to have an effect on teaching because of the organizational ethos they create rather than specific interpersonal interactions or interventions.

Summary

The literature suggests two critical questions that have not been fully examined in the existing literature:

- (1) Do three specific attributes of leadership behavior – the sharing of leadership with teachers, the development of trust relationships among professionals, and the provision of support for instructional improvement – affect teachers’ work with each other and their classroom practices?
- (2) Do these leadership behaviors and attributes of formal school leaders contribute to student achievement?

An analytic framework derived from the review of the literature and our previous investigation of the relationship of principal leadership and instruction (Wahlstrom & Louis, 2008) guided us in our examination of how teachers experience the leadership effects of the principal. We assume that both principal–teacher relationships (indicated by trust, instructional leadership, and perceptions of shared leadership) and teacher–teacher relationships (indicated by professional community) will affect classroom practice. Classroom practice – particularly the type of focused instruction that thoughtfully combines elements of teacher-directed and constructivist approaches – should, in turn, affect student learning. We already know a considerable amount about these subcomponents. We know much less about how they interact to affect student learning, because there is little evidence, from either

survey or qualitative methods, that principal leadership can have a direct effect without involving changes in teacher practice.

Methods

Data sources

Data for this study are from 2005 and 2008 teacher surveys developed for a US research project funded by the Wallace Foundation. Begun in December of 2004, this mixed-methods project aims to further our understanding about the nature of successful educational leadership and how such leadership at the school, district, and state levels eventually influences teaching and learning in schools. The research design called for the collection of quantitative data at either end of the 5 years work with three rounds of qualitative data collection in between. The quantitative data are provided by surveys of teachers and administrators, along with student achievement and demographic data available from the district or state.

The sampling design involved respondents in 180 schools nested within 45 districts nested, in turn, in nine states. These states were randomly sampled from the four quadrants of the USA. Districts and schools were chosen randomly within states, with the sample stratified to reflect variation in organization size, socio-economic status (SES), and achievement trajectories over 3 to 5 years prior to the start of the data collection. The quantitative sample included 157 schools and the teachers and administrators who were members of them. The sample deliberately represented elementary and secondary schools in equal numbers. This paper utilizes both the first round and second round of survey data from teachers.⁴

The two surveys each contained items from established instruments as well as new items. All attitudinal variables were measured with 6-point Likert scales. The instruments were field-tested with teachers, and meetings with respondents led to subsequent changes in the wording of questions to improve clarity. The finalized instruments were mailed to individual schools and were typically completed by all teachers during a school staff meeting. Each survey was accompanied by a blank envelope that could be sealed to ensure confidentiality, so that none of the principals had access to the teachers' responses.

Surveys were administered in the winter of 2005–6, and again in the spring of 2008. This paper is based on surveys from 4,491 teachers in 43 districts in 157 schools, with a response rate of 67% in 2005–6, and 3,900 teachers in 40 districts in 134 schools, with a response rate of 55% in 2008. The method of survey administration, which involved filling out surveys during a faculty meeting, makes a completely accurate response rate difficult, largely because of incomplete staff lists at the building level. However, because of the method of administration, it was more typical to get a large bundle of surveys (presumably a high within-school response rate) or none at all. In addition, a few schools that participated in 2005–6 dropped out for 2008 and were replaced. Because we use data from both surveys, our *N* of schools is thus reduced to 106 when missing achievement data are factored in. The 106 schools include 50 elementary schools, 34 lower secondary schools (middle or junior high schools), and 19 upper secondary schools/high schools. The remaining 3 schools had unusual grade structures (K–8).

The analysis in this paper combines some measures from the first survey (principal leadership variables) with some from the second survey (measures of trust

and an improved measure of focused instruction). Measures of student achievement were derived from school-level scores on the states' tests used for measuring adequate yearly progress (AYP) in response to No Child Left Behind, while grade levels (which were recoded to elementary/secondary) were ascertained from state data bases. School poverty was estimated by the percentage of students eligible for Free and Reduced Price lunch (from state data bases).⁵

Variable construction

Each of the variables reflecting the components of our framework were measured in the teacher survey using multiple items in the surveys. Scaled variables were developed using extensive exploratory scaling techniques, primarily factor analysis, to ensure that items that were expected to scale loaded on the same factor. All variables were computed using the individual teacher responses, and all have a reliability score (alpha) of .7 or better (Table 1). Variables were then aggregated to the building level, in order to combine them with student achievement data, which was only available for buildings.

Focused instruction

The instruction variable that we use in this paper reflects our previous analysis that suggested that teachers may, in their own work, be bridging the scholarly debates between constructivist and direct instruction by developing strategies that are designed to incorporate elements of both. Our initial analysis of instruction in the 2005 survey did not anticipate this result, which was based on factor analysis (Wahlstrom & Louis, 2008). In the second survey, we added additional items that we thought might load on this factor, and the subsequent factor analysis affirmed the coherence of the augmented variable. The measure of instruction is, thus, from the second survey.⁶

Teacher's professional community

A single variable was developed to examine the nature of teacher's relationships with each other. It is based on a factor analysis of items that measure professional community and were derived from previous instruments (Bryk et al., 1999; Lee & Smith, 1995; Louis & Marks, 1998). While four distinct factors that were consistent with previous studies of professional community emerged (Wahlstrom & Louis, 2008), the items were all highly correlated, and it was decided for the purposes of this paper to use a single composite (additive) scale. Data measuring professional community were taken from the 2005 survey. The building level correlation between professional community scores in 2005 and 2008 was .93, indicating that this is a stable organizational characteristic.

Shared leadership

The shared leadership variable was developed based on a factor analysis of a longer battery of teachers' ratings of their principal's behaviors from the 2005 survey (Wahlstrom & Louis, 2008).

Instructional leadership

The 2005 survey measure of instructional leadership was modified in the 2008 survey to include new items that were based on both our own and other's work in this area. The main change was to incorporate several additional items that tapped specific principal behaviors.

Trust in principal

We became more interested in exploring trust as the study developed, and the second survey added measures taken from the instruments developed by Tschannen-Moran (2004) to the 2008 survey. As expected, the items scaled well. (See Table 1 for scale items for this and all other scaled survey variables.)

Student achievement

Data used to measure student achievement across schools were collected from state websites. These data were school-wide results on state-mandated tests of language and mathematics at several grade levels over 5 years (2003 to 2007). For purposes of this study, a school's student achievement was represented by the percentages of students meeting or exceeding the proficiency level (usually established by the state) on language and math tests. These percentages were averaged across grades and subjects in order to increase the stability of scores (Linn, 2003), resulting in a single achievement score for each school for a given year. In this analysis, we used the 2005 mathematics test results, based on two assumptions: (a) that building level instruction is more likely to be consistent in mathematics because of long-term efforts by US professional associations to develop standards (Newmann & Associates, 1996) and (b) that the 2005 data were collected in a year when the fewest states in our sample had made recent changes to the tests, thus increasing the likelihood that they would be slightly more stable.⁷

Analysis

Paired-sample *t* tests were used to compare mean ratings on the variables to determine whether there were differences between buildings (not tabled). Hierarchical multiple regression was used to examine the moderating effects of school level (elementary or secondary) on some relationships in our framework. We then used structural equation modeling (SEM; using the SPSS AMOS program) to examine the direct and indirect effects of leadership on achievement. Although we report data for mathematics achievement, we conducted similar analyses using the state literacy test scores, with similar results to those reported below.

Findings

We initially assumed that the effects of leadership on student achievement are largely indirect, operating through other variables. We examined this assumption through correlations, which are presented in Table 2. The results indicate that student math achievement scores are significantly associated with focused instruction, professional community and teachers' trust in the principal but are not significantly associated

Table 1. Scaled items for analysis.

New Variable	Alpha	Survey Items
Focused Instruction	.77	3-16 My instructional strategies enable students to construct their own knowledge. 3-17 I maintain a rapid pace of instruction in my classes. 3-18 Disruptions of instructional time are minimized. 3-19 Most students in my class are capable of taking charge of their own learning in age-appropriate ways. 3-20 I focus on developing a deep knowledge of the core subjects that I teach.
Professional Community	.85	2-4 Most teachers in our school share a similar set of values, beliefs, and attitudes related to teaching and learning. 2-8 In our school we have well-defined learning expectations for all students. 2-11 Our student assessment practices reflect our curriculum standards. 3-15 Teachers support the principal in enforcing school rules. 3-16 How many teachers in this school feel responsible to help each other improve their instruction? 3-17 How many teachers in this school take responsibility for improving the school outside their own class? 3-18 How many teachers in this school help maintain discipline in the entire school, not just their classroom? 3-20 How often in this school year have you invited someone in to help teach your class(es)? 3-21 How often in this school year have you had colleagues observe your classroom? 3-22 How often in this school year have you received meaningful feedback on your performance from colleagues? 3-23 How often in this school year have you visited other teachers' classrooms to observe instruction? 3-24 How often in this school year have you exchanged suggestions for curriculum materials with colleagues? 3-25 How often in this school year have you had conversations with colleagues about the goals of this school? 3-26 How often in this school year have you had conversations with colleagues about development of new curriculum? 3-27 How often in this school year have you had conversations with colleagues about managing classroom behavior? 3-28 How often in this school year have you had conversations with colleagues about what helps students learn best?
Shared Leadership	.78	The department chairs/grade-level team leaders influence how money is spent in this school. Teachers have an effective role in school-wide decision making.

(continued)

Table 1. (Continued).

New Variable	Alpha	Survey Items
Instructional Leadership	.82	Teachers have significant input into plans for professional development and growth.
		School's principal(s) ensures wide participation in decisions about school improvement.
		How much direct influence do students have on school decisions?
		How much direct influence do school teams (depts., grade levels, other teacher groups) have on school decisions?
		My school administrator clearly defines standards for instructional practices.
		How often in this school year has your school administrator discussed instructional issues with you?
		How often in this school year has your school administrator observed your classroom instruction?
		How often in this school year has your school administrator attended teacher planning meetings?
		How often in this school year has your school administrator made suggestions to improve classroom behavior or classroom management?
		How often in this school year has your school administrator given you specific ideas for how to improve your instruction?
Trust in Principal	.90	How often in this school year has your school administrator buffered teachers from distractions to their instruction?
		When teachers are struggling, our principal provides support for them.
		Our principal ensures that all students get high quality teachers.
		If my principal promised to do something, s/he would follow through.
		In general, I believe my principal's motives and intentions are good.
		I feel free to discuss work problems with my principal without fear of having it used against me later.

with principal behaviors (instructional leadership and shared leadership), which provides support for our assumption. Trust in the principal and professional community, on the other hand, are both associated with student math achievement, which suggests that relationships among adults may be important factors determining how well students perform. In our sample, students in elementary schools perform better than students in secondary schools on state benchmark tests.

If we look at the remaining cells in the correlation matrix, it is clear that the measures of predictor variables are rather highly correlated. Our data support other studies, for example, in suggesting that many measures of teachers' quality of work life (trust, professional community, experiences of strong leadership) are lower in secondary schools (Louis & Marks, 1998). In addition, it is apparent that teachers whose experiences with other adults are positive on one of our dimensions tend to have similarly positive responses on the others. In sum, while the results are

Table 2. Correlations among variables in the model ($N = 103$).

	2004-05 Mean math proficiency for that building	Building Mean Focused Instruction	Building Mean Instructional Leadership T2	Building Mean Trust T2	Building Mean Shared Leadership	Building Mean Professional Community
2004-05 Mean math proficiency for that building	1					
Building Mean focused instruction summed	.269**	1				
Building Mean Instructional Leadership T2	-.071	.310**	1			
Building Mean Trust T2	.475	.001	.490**	1		
Building Mean Shared Leadership	.249*	.436**	.000	.256**	1	
Building Mean Professional Community	.011	.000	.106	.007	.597**	1
Bldg Level 0 = Elem 1 = Mid/Jr/Sr	.170	.330**	.276	.451**	.000	-.540**
	.052	.000	.420**	.000	-.209*	.000
	.198*	.510**	.000	-.166	.086	.014
	.023	-.315**	.001	.009		

**Correlation is significant at the 0.01 level (2-tailed).

*Correlation is significant at the 0.05 level (2-tailed).

confirmatory, they suggest a need for further analysis to investigate how the relationships among the variables may combine to affect teachers' classroom practices and student learning.

We therefore went on to conduct several stepwise regression analyses to address the two questions laid out at the beginning of this paper. First, we extended the results of earlier investigations (Louis & Marks, 1998; Wahlstrom & Louis, 2008), looking at the relationship between principal behaviors and characteristics and teachers work (Table 3). Using a three-model approach, we first examined the relationship between professional community and focused instruction, adding principal behaviors and characteristics in Model 2 and finally adding school level, which has been shown to affect both professional community and instruction in previous studies (Louis & Marks, 1998). The results suggest that professional community and trust in the principal are the only significant predictors. In addition, until building level is added in Model 3, professional community seems to bear more weight than trust (the change in the relationship in Model 3 is presumably accounted for by the negative relationship between being a secondary school and trusting the principal). At first blush, therefore, it appears that it is relationships among adults in the school, whether principal-teacher or teacher-teacher, that seem to lead to stronger focused instruction.

To answer the second question, which asks what effects principal leadership has on student achievement, we again used a three-model approach (see Table 4). We first looked at the instruction-learning relationship in Model 1, then added professional community (teacher-teacher relationships) as a second step, and finally adding both building level and leadership characteristics in a third stage (Table 3). The overall results indicate that instructional practices have a significant effect on achievement (Model 1), but that this effect is diminished when we introduce teachers' professional community (Model 2) and is further diminished when we look at school level and school demographic characteristics (Model 3).

Table 3. Regression of focused instruction on professional community and principal leadership.

Model		Standardized Coefficients		Significance		Model F/Sig. Change	R(R ²)
		Beta		t	Sig.		
1	(Constant)			9.471	.000		
	Prof. Community	.510		6.102	.000	.37.24***	.51(.26)
2	(Constant)			9.138	.000		
	Prof. Community	.337		3.173	.002		
	Prof. Community	.119		1.076	.284		
	Instruc. Leadership	.041		.422	.674		
	Trust in Principal	.239		2.432	.017		
	Shared Leadership	.096		1.014	.313	12.15*	.56(.32)
3	(Constant)			8.141	.000		
	Prof. Community	.280		2.285	.024		
	Instruc. Leadership	.051		.524	.601		
	Trust in Principal	.233		2.358	.020		
	Shared Leadership	.113		1.167	.246		
	Building Level	-.092		-.946	.346	9.9	.57(.33)

Table 4. Regression of math achievement on model variables (standardized regression coefficients, building means, $N = 103$).

Model	Standardized Coefficients		Significance		Model F/ Sig. Change	$R(R^2)$
	Beta		<i>t</i>	Sig.		
1 (Constant)			-1.372	.173		
Focused Instruction	.267		2.785	.006	7.76**	.27(.07)
2 (Constant)			-1.624	.107		
Focused Instruction	.208		1.887	.062		
Prof. Community	.119		1.076	.284	4.46*	.29 (.08)
3 (Constant)			-.695	.489		
Focused Instruction	.179		1.597	.114		
Prof. Community	.108		.761	.449		
Bldg Level	-.154		-1.398	.165		
Instruc. Leadership	-.315		-2.816	.006		
Trust in Principal	.243		2.102	.038		
Shared Leadership	-.059		-.534	.594	3.74**	.44(.19)

Sig \geq .01 *.** \geq .001**.

The regression models furthermore show that adding professional community to the simple instruction–achievement model barely raises the percentage of variance explained. However, when the leadership variables are added in Model 3, there is a large increase in the R and R^2 , which suggests that principal leadership, even if it is indirect, is important. Both trust in leadership and instructional leadership exhibit significant regression coefficients, while building level and shared leadership are insignificant. Overall, adding leadership variables and the building level control variable more than double the percentage of variance in math achievement that is explained.

While the regressions support our assumption that leadership affects student learning, we assumed that it was unwise to overinterpret the regression coefficients due to the relatively high levels of multicollinearity among the predictor variables. In addition, the results of the two regressions raise as many questions as they answer: Why, for example, does principal instructional leadership have an insignificant effect in the regressions that look at instruction as the dependent variable, while exhibiting a strong effect when the dependent variable is student achievement? We therefore moved to test our assumptions through structural equation modeling, guided by a set of possible interpretations of the regressions, as well as the literature reviewed above.

Figure 1 presents the model that illustrates the least complicated approach to answering the two questions that motivated our inquiry. The model makes several simplifying assumptions:

- (1) We do not yet know enough to examine a causal relationship among the three measures of leadership behavior/characteristics. They are, thus, positioned, along with the dichotomous variable reflecting the building level (elementary/secondary) at the left side of the model.

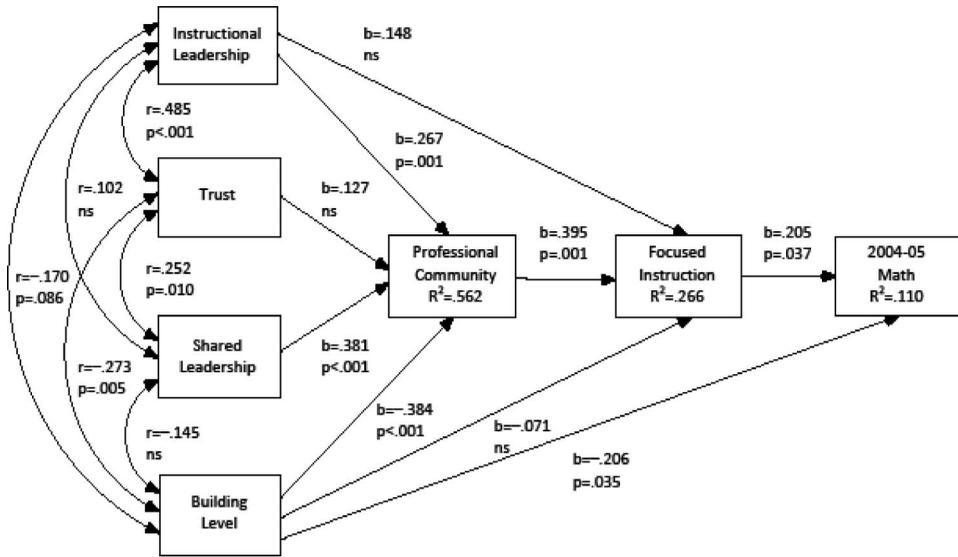


Figure 1. Path model of the effects of leadership on student achievement.

- (2) We then assume, based on existing research, that leadership behaviors and characteristics may create the conditions for professional community to develop among teachers rather than there being a reciprocal relationship.
- (3) We assumed that instructional leadership might have a direct relationship with classroom practices, since our measures incorporate discussions of practice between teacher and principal. Shared leadership and trust, however, were assumed to have an indirect relationship with classroom instructional practice, since none of the items included in the scales reflect pedagogy.
- (4) We assumed that professional community would not have a direct effect on students because students experience classrooms but not the conversations that occur among teachers.

Additional model assumptions will be discussed in our interpretations of results, which follow.

The maximum likelihood method was used for the path analysis. Goodness of fit between the model and the data was assessed via three fit indices: the goodness-of-fit index (GFI), normed fit index (NFI), and the comparative fit index (CFI). GFI, NFI, and CFI values greater than .9 indicate that the model is a good fit with the data (Bentler & Bonett, 1980). The CFI is particularly critical, since it is a useful statistic with relatively small samples (Bentler, 1990). The values of the GFI (.952), CFI (.924), and the NFI (.900) all meet the suggested criterion. Taken together, these results indicate that the fit between the model and the data is adequate.⁸ We interpret the findings of the path analysis as follows:

- Instructional leadership was assumed to have both direct and indirect effects on instruction, since the measure included principals' visits to classrooms and other behaviors that might involve direct recommendations or advice about change in instruction. Our model suggests, however, that, although principal

instructional leadership has significant effects on teachers' working relationships (professional community), its effects on instruction are limited.

- Shared leadership was not assumed to have a direct effect on instruction, but rather an indirect effect through professional community as a locus for teacher leadership around improvement. The model confirms this indirect relationship.
- Trust, which represents the emotional and professional bond between the principal and teachers, was assumed to have strong effects on teacher–teacher relationships. The model suggests, however, that its impact on professional community is limited compared to leadership behaviors.
- Building level, as expected, has a strong effect on professional community (with elementary schools being advantaged) and an equally strong direct effect on achievement (again an elementary school advantage), but no significant effect on focused instruction. This latter result was not expected and suggests a need for further investigation to understand the dynamics of professional community, instruction, and achievement in high schools.
- Professional community has significant indirect effects on achievement due to its strong relationship to focused instruction.

Summary and discussion

This analysis provides a relatively comprehensive empirical “test” of the notion that a number of leadership variables (e.g., instructional leadership, shared leadership) and trust in the principal, when considered together, are positively related to student learning. Our work suggests that shared leadership is one important means of creating a learning organization in which efforts are focused on ways in which increasing instructional capacity can influence student learning. We found several critical differences between elementary and secondary schools that are particularly important in developing a theory of effective school leadership. In particular, the exercise of leadership for student achievement appears to be much easier in elementary rather than in secondary settings.

Although we can make a straightforward summary of the findings, we also note that they are complex and suggest a need for further analysis. First, the emotional side of school leader behavior, which we have examined as teachers' trust in the school leader as ethical, caring, and competent, has been shown in previous studies to have a strong relationship to student outcomes. In our study, however, its relative significance diminishes when we take into consideration reported leader behaviors, as measured by our constructs of instructional leadership and shared leadership. We are not prepared, based on a single study and a simple path model, to discount the importance of the emotional side of leadership. Because trust is highly correlated with other key measures in this study, we are inclined to say that our findings require additional exploration and, perhaps, more elaboration about the way in which emotions and behaviors interact. This should build on existing work on the emotions of leadership but also incorporate attention to more instrumental leadership actions (Hargreaves, 2002; Leithwood & Beatty, 2007; Little, 1996; Zembylas, 2003).

Shared leadership and instructional leadership are both important, but they are indirectly related to student achievement. In addition, both seem to gain their influence because they have strong relationships to the way in which teachers organize themselves into professional communities characterized by strongly held norms and values, reflective discussions about instruction, and a sense of collective

responsibility for student learning. This finding is hardly surprising when we consider the arguments for shared leadership, which generally focus on expanding the sphere of responsibility and creativity to meet pressing school needs. The largely indirect effects of instructional leadership are, however, equally significant. While principals may engage in classroom visits and model good teaching by working with individual teachers, individual interventions (which would have emerged as a direct effect on good classroom practice) seem less important than detailed investigations of elementary schools suggest (Spillane, 2005; Stein & Nelson, 2003).

The finding is important because these two forms of leadership are often regarded as alternative strategies to reach the desired end of student learning. Those advocating instructional leadership emphasize the need to maintain a singular focus on classroom practice as the key to raising student achievement and point to the important role of the school leader as a model. Others who look at shared leadership and teacher leadership point to the importance of creating a learning organization in which all eyes are focused on leadership for learning. Our data suggest that these are complementary approaches, and that both may be necessary. Thus, using a larger and more diverse sample, we affirm Marks and Printy's (2003) work, which emphasizes the importance of combining leadership foci (in their case, transformational and instructional).

The findings with respect to differences between elementary and secondary schools are particularly important as we begin to develop theories of effective school leadership. Our results, as we have noted, are far from definitive, but what is clear is that the job of influencing student achievement is far easier in elementary schools than in secondary settings.

Before discussing the implications of this study, we hasten to note a few of its limitations. First, although the sample is large and comprehensive, it is limited to a single country. There is a great deal of evidence to suggest that the exercise of leadership and its effects are deeply embedded in national as well as organizational cultures. Second, there are clearly limitations to the use of SEM, which include both its requirements to assume causality (where mutual interdependence may be a more realistic assumption) and the distinct possibility that omitted variables might influence the overall model. Some of these might be addressed through a longitudinal design (see, e.g., Heck & Hallinger, 2009) or through case studies.⁹ Third, there are clearly variables missing from the SEM model that might be important. We plan, for example, to explore the importance of district and student demographic characteristics in further analyses.

Implications for policy and practice

We have argued that there is a need for additional research to examine the specific leadership behaviors that are most effective in supporting student learning. However, even without additional investigations, there are four clear implications

First, both teachers and those with formal administrative responsibilities need to acknowledge and act on the increased importance of collective and shared work around instruction. Professional community is too frequently considered an administratively initiated program to encourage teachers to analyze student achievement data and turn it into increased test scores. Our analysis suggests that the reality is more complex. Not only do teachers need to work together around instruction and student

learning, but administrators need to be part of that process. While this may be as simple as having principals participate in professional development activities for teachers, or as difficult as reorganizing the formal authority structure of the school, it requires a substantial rethinking of the “bright line” that all-too-often separates administration and teaching.

Second, it is important to provide significant additional support for secondary school leaders to establish the kind of instructional leadership that is “workable” in their larger and more complex settings. It is unlikely that real improvements in the climate for principal–teacher collaboration and improved achievement in secondary schools will occur simply because of increased pressure. Because most districts have only a small number of secondary schools, their ability to refocus energies and supply the support for change is limited. We suggest that states or even regional/national entities will need to be involved. Because we know from international studies such as the Programme for International Student Assessment (PISA) and the Trends in International Mathematics and Science Study (TIMSS) that US secondary schools (particularly high schools) are the weakest link in the US educational system, and they show limited evidence of improving under current accountability policies, we suggest that this must be a priority for school reform.

Third, school leader preparation and professional development programs should continue to emphasize both the “softer” (emotional) and “harder” (behavioral) aspects of leadership. Although our results suggest that principal behaviors are more important than emotional factors like trust, they are empirically part of a bundle that is difficult to separate. Although trust without supporting instructional and shared leadership may be of little consequence for students, our data suggest that teachers’ relationships with each other and their trust in the principal cannot be easily disaggregated.

Fourth, while there is increased emphasis on the responsibility of principals for student test scores, it is important to remember that their primary focus within the school must be on instructional and shared leadership. Increasing teachers’ involvement in the difficult task of making good decisions and introducing improved practices must be at the heart of school leadership. There is no simple short-cut.

Notes

1. This analysis was supported by a grant from the Wallace Foundation. The funding agency bears no responsibility for the contents of this paper.
2. See Ogawa and Bossert (1995) for a discussion of the relationship between broader patterns of leadership as an organizational property.
3. This view of shared leadership reflects an emerging consensus among current scholars and distinguishes our approach from scholars who blend shared leadership with instructional leadership (Marks & Printy, 2003).
4. Principal surveys and qualitative data around instructional leadership are being analyzed in other papers and reports (see Louis et al., 2010, for the broadest review).
5. While teachers are associated with principals, we do not have individual student achievement scores and are therefore unable to use a hierarchical analysis like hierarchical linear modeling.
6. Two other factors emerged on our initial efforts to examine instruction, which are described in a previous paper (Wahlstrom & Louis, 2008). While not reported here, we initially attempted to use them in this investigation. However, neither of the other instructional factors is associated with the measure of student achievement used in this paper, nor with other measures available to us. We therefore have chosen not to report these findings.

7. Because of changes in state tests and state cut scores on stable tests, and the inability to obtain tests at the student level from many states, we were unable to look at changes in test scores over the 5-year period, which was our original intention.
8. The RMSEA is .45, which is considerably higher than the suggested value of .05.
9. We have, elsewhere, drawn on our case study data to illuminate some of the differences between instructional leadership in elementary and secondary schools (Louis et al., 2010, pp. 74–90), but the interview data from teachers are relatively thin.

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