DISTRICTS, TEACHER LEADERS, AND DISTRIBUTED LEADERSHIP:
CHANGING INSTRUCTIONAL PRACTICE

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Abstract

The growing interest in distributed leadership reflects an effort to reconceptualize leadership in schools by exploring how leadership is spread across a variety of roles and to explore the process of leadership. Using case studies of four schools in three districts, this paper explores how leadership is distributed in school districts and asks about the role of teacher leaders in particular. It proposes that teacher leaders and districts can share three leadership tasks: procuring and distributing materials, monitoring improvement, and developing people. The district and teacher leaders play complementary roles. Districts tend to be distant forces, and teacher leaders are more personal. How effective teacher leaders do at people development will depend on the time they have, the knowledge they have, and their monitoring responsibility. These conditions depend partly on their administrative support. We suggest that districts may have more opportunity to influence teaching practice than past research had indicated.

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The growing interest in distributed leadership reflects an effort to reconceptualize leadership in schools by exploring how leadership is spread across a variety of roles and to explore the process of leadership (Spillane, Halvorson, & Diamond, 2004). However, most research on distributed leadership has examined its distribution within schools and not looked beyond them. This paper seeks to expand the reach of distributed leadership research by exploring how leadership is distributed within school districts. It explores three questions:

- How do districts influence teaching practice?

- How do teacher leaders influence teaching practice?

- What is the relationship between teacher leaders and districts in educational change efforts?

These questions are explored through case studies of four schools in three school districts that collaborated with a university-based program to improve the teaching of mathematics and science.

Evidence from these cases suggests that districts may be able to have more influence on teaching practice than past research coming out of the loose coupling tradition (Bidwell, 1965; Meyer & Rowan, 1977) has indicated. Using these cases, we also propose that a distributed leadership framework can suggest how teacher leaders can be integrated into a district-wide change effort and complement district leadership. More specifically, we identify the leadership tasks that the district and teacher leaders conduct jointly—procuring and distributing resources, monitoring implementation, and

developing people—and the conditions under which teacher leaders are most effective at contributing to the final task.

Research

Leadership is notoriously difficult to define but it usually involves the exercise of social influence, usually in the service of some collective end, often organizational productivity (Leithwood, Jantzi, & Steinbach, 1999; Smylie, Conley, & Marks, 2002). Distributed leadership moves away from individual- and role-based views of leadership to those that focus on the organization and on leadership tasks (Smylie et al., 2002).

The term "distributed leadership" has been used in two ways. One is normatively, as a quasi-synonym for democratic leadership and as part of an effort to either expand the administrative apparatus of schools or to give more authority to teachers (Harris & Muijs, 2005). It is much like corporate research on shared leadership (Pearce & Conger, 2003). The other is as an analytic perspective to understand how leadership work is spread among leaders, followers, and the situation (Spillane et al., 2004). This second usage is intended to have no normative loading. There is to be no advocacy for (or against) teacher leadership or any particular pattern of leadership distribution. Rather the task is to describe different ways in which leadership is distributed and their causes and consequences.

Whichever orientation is taken, however, most examinations of distributed leadership focused on the school and explored the spread of leadership among principals and teachers without exploring the role of the district. This paper expands the focus of leadership distribution to the district. We focus on three questions.

The first is how do districts influence teaching practice? While there has been a range of views on this issue, expectations for district influence have been low. Some have viewed districts as structurally loose entities that gave teachers considerable autonomy (Bidwell, 1965). Others pointed to a zoning of authority in which the district had more authority over curriculum than instruction but expected teachers to have substantial autonomy in the classroom (Lortie, 1975). Yet, even when the district had authority over curriculum, observers doubted that it was used effectively (Floden et al., 1988).

More recently, observers have noted that districts have been willing and able to bring about changes in some kinds of practices, but not others. They have been more likely to and able to ensure the implementation of practices that can be brought about through the enforcement of a clear, unambiguous policy (Rowan & Miskel, 1999). Practices that require the re-education of teachers appear more difficult to implement (Fairman & Firestone, 2001). Districts' willingness to influence teaching practice appears attributable to growing accountability pressures from state and federal government (Firestone & Shipps, 2005; Stecher & Barron, 1999).

What tools or influence mechanisms do districts use to influence teaching? Reviews of the limited available research point to a limited set of possibilities. These include adopting a curriculum, providing time for instruction and specifying how that time should be used—i.e., how time should be allocated among subjects, providing professional development, and building a district normative culture that emphasizes the use of specific instructional strategies, high expectations for all students, and

collaboration among teachers in order to learn new practices (Leithwood, Louis, Anderson, & Wahlstrom, 2004; Marsh, 2002).

The second question concerns the influence of teacher leaders. While the idea of teacher leadership is not new, there is little consensus on what it should mean although there is a common understanding that teacher leaders are peers with no authority over other teachers (Harris & Muijs, 2005). Some formalized teacher leader roles, like department chairs, are quite well established, but have traditionally been administrative and part of the regular structure of schools. Smylie and colleagues (2002) note a change in reform uses of teacher leadership from the 1970s to the present. The first formalized teacher leader roles established individual teacher leaders in order to decentralize school structures and empower and professionalize teachers. When these experiments proved counter-productive, attention shifted in the 1990s to new strategies that included teacher research, leadership of teams and maintaining professional communities (Smylie et al., 2002), and coaching other teachers (Timperley, 2005). In addition, informal teacher leadership has always existed, although teaching tends to be an isolated occupation in which individuals have relatively little opportunity to share what they do with other adults during the working day (Lortie, 1975).

Teacher leadership tasks are as diverse as teacher leadership roles (Harris & Muijs, 2005). Some teacher leaders are involved in administrative work like setting standards for student behavior, deciding on budgets, and addressing personnel issues. Some serve as go betweens or liaisons between administrators and teachers. Of most interest, others focus on issues of curriculum and instruction and help their peers improve their own teaching.

The evidence on how teacher leaders help their peers improve their teaching is quite weak, perhaps because teacher leadership takes so many forms, but also because of the poor design of past research (York-Barr & Duke, 2004). Nevertheless, some conditions seem to facilitate teacher leader influence. For instance, teacher leaders that have the time and opportunity to interact with their peers appear more likely to influence them (Gigante, 2006; Harris & Muijs, 2005). Those that have an understanding of teaching practices and the content in the area where they are providing assistance may simply have more to offer to their peers and therefore be better able to build a relationship with them (Manno, 2005). Finally, because teaching is isolated, autonomous work, the assistance that accompanies coaching may require teachers to disclose potentially embarrassing information. Thus, trust may be a prerequisite for an effective helping relationship (Bryk & Schneider, 2002; Louis & Kruse, 1995).

The third question concerns the relationship between the district and teacher leaders. At the extreme, these relationship could be oppositional. Some recommend that school districts centralize more and hold principals and teachers accountable for their practice (Cawelti & Protheroe, 2001; Ouchi, 2003). Meanwhile, some writing on teacher leadership is explicitly "anti-hierarchical," focusing on teacher empowerment (Silva, Gimbert, & Nolan, 2000). Others examine teacher leadership where administrative leadership has to some extent fallen short. Heller and Firestone (1995) describe teachers helping to maintain the vision for a program in part because administrators did not.

Yet, districts and teacher leaders may also be complementary. On the one hand, teacher leaders may depend on their district for some of the conditions that facilitate their work. These include the time, materials, and opportunities to interact with teachers.

District leaders may also affect teacher leaders' relationships with teachers depending on what demands they place on the latter for monitoring teaching practices (Gigante, 2006; Harris & Muijs, 2005).

On the other hand, the district may depend on teacher leaders to improve teaching practice and support its initiatives. Many of the of the district's sources of influence are substitutes for leadership (Kerr & Jermier, 1978). As artifacts, schedules, or shared understandings, they operate at a distance to shape interaction. They lack the personal and informal touch that teacher leaders can offer and that may be extremely helpful in facilitating individual learning. Teacher leaders may be especially useful in contributing this missing piece.

Distributed leadership provides a way of thinking about how the work of school districts and teacher leaders may or may not complement each other. One growing point of consensus in theorizing about distributed leadership is that leadership work is carried out through a series of tasks or activities, although there remains considerable disagreement about what those activities might be (Leithwood et al., Forthcoming ; Spillane et al., 2004). These tasks may be means of influence. A representative list of leadership tasks would include developing and maintaining a vision of an effective school or district; developing and managing a culture to support that vision; providing encouragement; procuring and distributing resources; supporting the growth and development of people in the organization; and monitoring instruction, innovation, and the overall climate (Heller & Firestone, 1995; Spillane et al., 2004). The challenge becomes distributing the work of accomplishing these tasks across roles and ensuring and appropriate alignment between people in diverse jobs. The theoretical and practical

challenge for research on distributed leadership in school districts is to identify what constitutes an appropriate pattern of task distribution and to clarify what factors affect how those tasks are distributed. To cast further light on that issue, we turn to our cases.

Methods

This study draws on a larger study conducted at the Center for Educational Policy Analysis (CEPA) at Rutgers University, of schools partnered with the New Jersey Math Science Partnership (NJ MSP). The NJ MSP engaged two local universities and eleven school districts in the improvement of math and science teaching. Funded by the National Science Foundation (NSF), NJ MSP sought to increase district and school capacity to adopt an inquiry-oriented approach to teach math and science. NJ MSP provided the unique opportunity to explore how teacher leadership roles, which were supported by the MSP, developed differently in each district and schools.

This study focus on four schools in three districts and their district contexts. The four schools were all those in the larger study that had teacher leaders. All were in "Abbott districts"—i.e., districts designated by the State Supreme court to receive special state aid to equalize funding with the wealthiest districts in the state because of their poverty.

The schools were poor, but they varied in their demographics although most students were Latino or African American (See Table 1).

In each school an average of eight teachers were interviewed along with principals and teacher leaders. Teachers were selected to represent different levels of experiences and grade levels. Teachers' credentials varied among the schools from Wood

where only 16% had masters degrees to Kahlo where half of them did. Six percent of the teachers in Marti School had emergency certificates.

The study used data from two consecutive years. Data collection for the MSP study started in the fall 2003 and continued in the schools through the spring of 2005. Additional data were collected through spring 2006. Data were collected in each school through observation, interviews and document analysis. Each teacher was interviewed six times, after a math or a science classroom observation. Data also includes two interviews with a principal, teacher leaders.

Table 1:
Schools Sample

Categories	Lopez	Kahlo	Marti	Madera
District	A	A	B	C
Grade Range	K-8	K-8	PreK-5	K-5
Enrollment	829	400	541	308
Percent Free or Reduced Lunch	86%	93%	87%	82%
Percent Hispanic	88%	84%	47%	15%
African American	11%	16%	52%	52%
White	n/a	0%	1%	32%
Students' mobility rate	13%	6.3%	1.7%	44%
Teachers with Emergency Certificate	0%	0%	6.4 %	0%
Teachers with Masters or Higher	37%	50%	27%	16%

In the spring of 2006, we interviewed district math and science supervisors. We also observed a two-day retreat with district and MSP leaders and teachers' meeting at each school. Semi-structured open-ended interviews (Patton, 1990), allowed gathering data about the roles and performance of district and school leaders. In addition, the study relies on data collected from previous studies of professional development and the effects of testing in the same districts. Moreover, in his the role as principal investigator of the NJ MSP, the senior author informally obtained information as a participant observer during MSP meetings with district and school leaders. This information provided valuable insights about district history and context. Multiple sources of data allowed triangulation, which increased the validity of the study. The fact that the interviews with different actors addressed the same issues allowed further triangulation.

Data identification includes sorting the data into analytically meaningful and easy to find segments (Reid, 1992). Through the process of coding, the researchers could assign analytical categories to segments of data. Coding allowed for retrieval of specific parts of the data later on during the analysis and enabled the researchers to combine and compare information from different sources. Transcribed interviews, observations and field-notes were coded using the software N6 for qualitative research.

The analysis consisted on rich descriptions and summaries of combined analytic categories. We wrote school based descriptions and cross-case comparisons. The analysis described the different ways teacher leaders and district influenced practice.

To increase validity, the analysis looked for disconfirming evidence. Prolonged engagement in the schools and districts as well as multiple visits to the teachers, teacher

leaders, and administrators contributed to building trust with the participants (Cresswell, 1998).

Our findings suggest that teacher leaders complement the district efforts. Teacher leaders and districts contribute to the same leadership tasks: procuring and distributing materials, monitoring the improvement effort, and developing people. However, they do so in different ways. Districts operate at a distance and rely on formal authority and substitutes for leadership while teachers rely more on close relationships to lead. Moreover, teacher leaders are constrained by the time they have to work, their own experiences and knowledge, and the tension between monitoring and providing professional development where monitoring can diminish the trust needed for the later. To provide the basis for these conclusions, we first introduce the districts studied. Then in turn, we describe district influence on teachers, teacher leadership influence on teachers, and how the districts affect teacher leaders.

Three Districts

Riverside

Riverside had had the same superintendent and deputy superintendent for twenty years at the start of field work. Like all urban districts in New Jersey, leaders worried about raising test scores and reducing achievement gaps. They therefore sought to exercise considerable control. Early in this superintendent's tenure, they had mandated "quarterly topic plans" to get teachers to follow the required curriculum for their grades.

The district also provided learning opportunities for teachers. These included a corps of teacher leaders who were content area "specialists" to assist elementary teachers. The math specialists taught one course and had free time for a variety of

assignments, including working with other teachers in their classrooms, providing teachers with the calculators and manipulatives they needed, running after-school test preparation programs, and developing materials that teachers could use in the classroom. helping other teachers teach better. Other specialists supported the teaching of science.

While the district was very sensitive to test scores and maintained was a strong central discipline, this discipline had a constructivist bent. The mathematics supervisor said that the deputy superintendent wanted district curricula "to be much more kid-centered, to be more focused on the child and, you know, and engaging the child in the activity." The math and science education leaders of the district saw their constructivist approach as a way to prepare for the state tests but recognized that people in the schools did not. One gave the following example:

> At one school, I remember they said, "We're doing Trailblazers but one day a week we're doing test prep." And I was like, "Look. Trailblazers is teaching the stuff on the test…" And test prep was, a drilling, you know… They did not understand that Trailblazers was building thinking and the kids who could think mathematically could do that test… But they still had that because… we hadn't reached a critical mass at that point where enough teachers believed it worked to sort of say to other ones… "You've got to stop doing that."

During the first year of field work, the superintendent and deputy superintendent left the district; the mathematics supervisor left the next year. The team that replaced them maintained the specialist positions but did not have the same understanding of curriculum or its relationship to testing. The district developed a narrower focus on raising test scores. According to a principal, "This year, unlike past years, every school,

at the direction of the superintendent, will be concentrating on one goal and one goal alone, which is student achievement, which can be interpreted as 'pass the test.'" While the curriculum remained the same, special test preparation programs became more common.

Victorian

Ten years before the start of field work, Victorian hired an outside new superintendent. This individual brought in a cosmopolitan team of change agents with an ambitious agenda for improvement. Initially it sought to reform instruction in several subject areas, but it soon focused on improving literacy achievement. After about three years, the effort was expanded to include mathematics. Its approach was to combine long-term efforts to build teachers' knowledge and understanding and implement state standards with shorter term efforts to raise test scores. Speaking to its interest in standards, the director of mathematics stated:

> I think that the children of Victorian deserve the same math and science
> experiences that everybody… else has. It should be standards-based. It should be
> high-level, it should be interactive, it should be hands-on. But I just think that
> that's… best practice for everybody.

In these early years, district leaders cited teachers' low motivation to engage in new learning and limited knowledge of mathematics and science as a problem for achieving those standards.[1]

Even before the district began focusing on improving mathematics education, it participated in a major NSF program to improve the mathematics teaching of selected teachers. This was the prelude to an effort to identify and groom informed teachers who

would become math "coaches," full time teacher leaders who would be available to help their peers improve their teaching of mathematics. When the district did shift more attention to mathematics, it hired one full-time coach for each elementary school. These steps were part of the district's larger vision of where its mathematics program should go. Implementing that vision also entailed professional development which was linked to the implementation of new curricula.

In the first year of field work, the superintendent took a job in another district and the deputy superintendent resigned. A new superintendent with experience in mathematics education was hired from outside the district.

Sandyfield

Shortly before field work began, Sandyfield promoted its assistant superintendent to superintendent. The superintendent promoted the science supervisor in the high school to district wide math and science supervisor. He saw three main challenges. One was to raise teachers expectations for students. The second was helping teachers, even at the elementary level, better understand the math they would be teaching. The third was moving to more of "an inquiry or a discovery approach in math as well as in science." He said, "I'm a great fan of the inquiry approach and discovery approach. I think students learn far more from their failures if they're allowed to fail and allowed to learn from it and move on, then simply by a teacher handing them answers." The district leaders saw these changes as compatible with the pressure to raise test scores and reduce achievement gaps. As a teacher explained, test scores are "important to the district as a whole…statistics are out and you know, the facts are in the newspaper…so it is very important".

These efforts were supported by ten teacher leaders, but these individuals had no release time to work with their peers. One, who worked with thirty teachers, said her job was to "be communicator between the district level and our school level, as far as new initiatives, materials, supplies, information. Lately it's been to celebrate test scores, we got an increase in test scores."

District Influence on Teaching

Some of the activities the districts engaged in fell clearly into well defined leadership tasks such as monitoring instruction, procuring and distributing resources, and supporting the growth and development of people. We discuss curriculum development separately because it fell across tasks and had other elements. Finally we discuss administrative succession because of its implication for the tasks of developing and maintaining district vision and culture.

Monitoring

An important part of influencing teaching was monitoring which happened directly through direct observation in supervision and indirectly through the use of testing. This was done with more or less reliance on formal authority. Victorian used a procedure called a "walkthrough" modeled on an approach used in District 2 in New York. Supervisors came into the classroom with a checklist that included the types of posters and graphics teachers needed to have and the type of teaching strategies.

In the other two districts, supervisors would check to ensure that teachers were following the curriculum and try to ensure that that was happening. At the same time,

they would work to build teachers' trust and knowledge by showing what they knew. As the new supervisor in Sandyfield explained:

> the elementary teachers were a little concerned three years ago… when I got the job because they said, "oh, he doesn't understand elementary. He's a secondary guy." So I made it a point to get out in the classrooms in front of them as soon as I could and every elementary teacher whose classroom I've been in has said the same thing to me. We're really surprised how good you are with the kids.

They often did this during their supervision visits by teaching part of a lesson or offering useful suggestions. The math supervisor in Riverside said she told teacher leaders to tell teachers:

> Dr. Adelman will come and observe… And she will sit and do the check-off. However, at some point, she will probably ask if she can ask a question. And she may even teach for a few minutes. Do not think that that means she doesn't think you're doing a good job. It's just that she's someone who is very passionate about teaching and very passionate about math. And so if she has… another strategy,… she's going to get up and model it for you…She's not going to write you up.

Direct supervision was supplemented by monitoring test scores. All three districts adopted a commercially developed test and implemented a district test to assess district benchmarks. Thus, most children took two tests, either the commercial test or the State test, and the district test. The district, teacher leaders and principals analyzed commercial test results and showed results to teachers. Leaders analyzed specific areas such as open-ended questions, from the test. The district's tests allowed leaders to monitor the implementation of the curriculum. The district test was also a way to ensure that the

teachers were following the required pace. This was particularly true at Sandyfield where curriculum pacing was a response not only to the need to reform mathematics and science, but to deal with high student mobility.

Procuring and Distributing Resources

Districts managed two kinds of resources that were important to teachers. The first was instructional materials. While materials were available in all three districts, communication around materials varied. Teachers at Wood could call the district supervisor as needed. At Riverside and Victorian teachers saw their supervisors during meetings, walk-through, and professional development events, but felt they had less influence than in Sandyfield.

All three districts also provided the teachers with practice-test materials that influenced instructional strategies and content coverage. Talking about how these materials influenced her teaching, a teacher reported that "Practice testing material [is] very influential because the New Jersey [test] is the priority in fourth grade… The format in the practice book is a help for them."

The second was time allocated for instruction. Districts had the authority to allocate time to different subject areas. In the Riverside and Sandyfield, the district increased the time to teach math. This affected how time was distributed in other areas. Madera School allocated 70 minutes for math every day. The two Riverside schools increased the time for math and decreased the time for science by ten minutes.

Moreover, the districts allocated more time for test-preparation. At Madera, the district organized an "After School Club" that met twice a week for math, and twice a week for literacy. Students who scored below certain criteria on district-administered

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tests were encouraged to attend. In order to have this "club," the district eliminated another after-school program that was open all the children who needed help with the homework. In Riverside, the district replaced an after-school enrichment program with a test preparation program provided by a private company. In addition, a large part of the program targeted English language learners, and instruction consisted of English vocabulary that might be on math tests.

Growth and Development of People

Districts addressed the growth and development of people primarily through professional development.[2] The quantity and quality of district professional development varied. In Riverside, teachers had been learning about constructivist pedagogy for eight years through on-going, in-depth professional development events. Teachers reported discussing content, pedagogy, and the reason behind teaching strategies during these events. They had monthly district workshops, and some were part of "Lesson Study Groups" led by the MSP liaison that discussed, implemented, and reflected on lesson plans. Generally, Riverside teachers showed more knowledge of the pedagogy when they spoke about the intentions of the lesson and the reasons behind the strategies they used.

Sandyfield began continuous professional development with a strong focus on how to implement the textbook with the introduction of that textbook. Teachers reported learning the new pedagogy and being aware that they needed more time to change their practice. They had monthly district-wide grade level meetings and had four workshops provided by a consultant. In addition, teachers often talked among themselves. Because the program was new, teachers had difficulties integrating knowledge about the pedagogy

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with their expectations about their students. Teachers transformed inquiry-oriented tasks, (such as allowing students to come up with different ways to solve a problem), into direct instruction, (lecturing about the different ways to solve problems).

Victorian introduced two new textbooks during the field work period (see below). Each year, the district provided three days of summer workshops on the use of each one. For most teachers, professional development began with the introduction of the first textbook, although some had participated in an earlier intensive program that provided a general introduction to constructivist approaches to teaching mathematics. In this new program, teachers met for three full days of hands-on workshops to perform tasks that their students would be require to do. Teachers mentioned that this kind of professional development increased both their knowledge of content and teaching strategies to implement the program. Some teachers reported not receiving as much professional development for the second math series. The emphasis in the second workshops was more on pacing, classroom management, and lesson planning than math content.

Curriculum

All three districts had centrally mandated mathematics curricula. They also expected teachers to use science "kits" to teach certain lessons in specific grades. These functioned as a material resource, much like manipulatives or other teaching materials. Their introduction became an occasion for the development of people. However, they were also key artifacts for controlling how teachers use their time. They also represented a vision of effective instruction so district leaders used them as a way to establish a new direction and build a culture of instruction.

The districts had several ways to control the implementation of the textbook. One was using formal authority to require teachers to follow the textbook. In all three districts, teachers reported that they were mandated to use math textbooks and follow a specific order in how they used them. In Riverside, a teacher mentioned, "[they] encouraged us to follow it step by step," and that they "had" to teach from the book because it was assigned to them. A teacher from Sandyfield said "Everything I needed is in the Everyday Math manual….You're not supposed to do anything extra. You're supposed to do exactly what the book asks you to do." And a Victorian teacher said that they were required to follow the book "to the letter" so that the company was to blame if test scores did not go up. Much of the monitoring described above was about the use of textbooks and materials.

The mandate to follow the book influenced both teaching strategies and the content teachers needed to cover. One teacher reported that the district leaders have pushed her to "move all the way through the book." And this feeling was shared among teachers from the three districts. Five Sandyfield teachers said that because of the new math series, they were teaching content that they had not taught before. For instance, a second grade teacher said she had never taught division before. But Sandyfield was the only district where that happened.

Most teachers from the four schools said that they used hands-on materials because the book suggested presenting the topics with manipulatives. When asked why a teacher had chosen to use straws and pins to make geometric figures, she said she was "following the Everyday Math format." All three textbooks—Everyday Math,

Investigations, and Trailblazers—provided many materials that allowed children multiple representations such as individual boards, manipulatives, etc.

While the district made the ultimate decision about which textbook to adopt, teachers' input varied. In Sandyfield, a few teachers brought back the idea of using Everyday Math—a moderately constructivist text—from professional development they received at a nearby university and tried it out at Madera before the math supervisor led a curriculum selection process. Through that process, Everyday Math was ultimately selected, in part because of those teachers' endorsement. Riverside held a similar committee process that led to the selection of Math Trailblazers, another moderately constructivist text. At Lopez and Kahlo Schools, some teachers felt they had had some input in the process, reviewing and comparing the textbook, but most teachers felt that the textbook was imposed. At Victorian, teachers said they had no input at all in the selection of Everyday Math. Nevertheless, through informal communication with parents, they influenced the district to end the use of a previous textbook which they deemed too constructivist and got the superintendent to bring together a committee of experts to recommend the change to that text.

Regime Succession

Regime changes affected district's capacity to change teaching in several ways. They influenced people development activities, for instance, and stability of curriculum. They also upset district vision and culture. Riverside had been moving its math program in a constructivist direction before its superintendent retired. When the new administration came in, some individuals said there was clearly a shift to more short-term test preparation activities. Beyond that, the district seemed to lose its instructional vision.

The Victorian administration had been in place for almost a decade and working on

mathematics reform for about five years with a tie to the local university for most of that

time. The Investigations had been part of that change. The new superintendent was more

willing to listen to parent and teacher complaints. She introduced an expert review that

allowed the shift to Everyday Math which teachers saw as more "back to basics" and less

different from their previous practice than the textbook that preceded it. The

administration that began just before field work in Sandyfield introduced new textbooks

and a new approach to instruction that changed content coverage as well.

Teacher Leaders' Influence on Teachers

Teacher leaders engaged in three tasks that influenced teachers.   They provided

materials, monitored, and supported the growth and development of people, most notably

teachers. The latter was the key task, but teacher leader's capacity to do it depended on a

fragile set of relationships. Monitoring, for instance, might work against the trust

necessary to support growth. As we describe how teacher leaders carried out each task,

we attend to the conditions that facilitate supporting growth and development. Table 2

indicates how many teachers from each school reported teacher leaders engaging each

type of activity.

Table: 2
Teacher Leaders' Tasks As Perceived by Teachers

Number of teachers per school. Number Saying Teacher Leaders:	Lopez N=10	Kahlo N=7	Marti N=11	Madera N=7

Provide Materials	8	6	10	1
Monitor	1	3	4	0
Coach	7	6	9	2

Providing Materials

All the teacher leaders in the schools we visited provided materials. Most teachers perceived this was helpful. A Riverside teacher mentioned "She will make the practice easier. That's very important." Teacher leaders were the direct sources of such supplies as calculators and manipulatives as well as science kits.

At Lopez School, the science teacher leader focused primarily on providing materials. She coordinated the use of the science kits (because schools shared the same materials) and ordered supplies. One teacher mentioned, "She makes sure that we have all the resources that our kits are refurbished with all that we need." Coordinating the use of materials in this case also implied determining and pacing the curriculum. Another teacher reported: "...she coordinates all science activities. She determines what you're gonna teach and try, the idea is to get uniformity across the district." As part of this role, she assisted teachers with their planning.

The teacher leader at Marti School provided copies of workbook activities during the year teacher were using the Math Investigations to supplement the curriculum with "basic skills practices". The next year, when she could no longer provide extra material since the district prohibited using materials other than the new textbook, the teacher leader provided copies of the assessments that teachers could use after each content unit. Providing these assessments helped the district control curriculum pacing and monitor the implementation of the textbook. Since the teacher leader's role changed from school-

based to district-based in Victorian, teachers had more difficulties accessing materials through the teacher leader so teachers had to go to friends instead.

Because the district supervisor provided most of the materials at Wood School, only one teacher said that the teacher leader distributed materials. Since the teacher leader role was new and ambiguous, teachers rarely asked the teacher leader for materials. But, if the teacher leader found out that a teacher needed materials, she would call the math supervisor and order them. One teacher said the teacher leader is "a point of contact people for math in the building who could contact the supervisor… so they just went to a workshop with the math supervisor last week and they sent us a little letter about what's going on."

While most teachers saw providing materials as very useful, its influence was limited. One Marti School teacher said "they [the teacher leaders] don't really help us with teaching it…the math coaches tell us what we need to have and they have a math folder and a portfolio folder and they help us with what needs to be contained in that." Still, teacher leaders could use providing materials to build relationships. A teacher leader in Sandyfield impressed a colleague by quickly getting a special set of manipulatives for her from the central office, for instance.

Monitoring

Eight teachers mentioned that the teacher leader monitored the implementation of the program. Monitoring can be intrusive and, if done inappropriately, can undermine the trust teacher leaders need to coach well. Monitoring was most prevalent at Marti School and to a lesser degree at Kahlo School.

Teachers said that teacher leaders monitored the pace of the curriculum. A teacher at Lopez in Riverside said that the teacher leader was "usually asking me questions, like where am I in the Foss kits." Similar statements were made in Victorian where the teacher leader asked teachers what chapter they were teaching.

The Victorian teacher leader also checked teachers' anecdotal notes. One teacher said, "[she] makes sure that …we're basically up to date…that…we're …definitely taking notes and trying to keep on top of things." In this respect, the teacher leader said that although she was not supposed to supervise, "I have to turn in reports or my logs, which may have notes and things that go on between the teacher and I. Then I feel that that is a supervisory type position." Since many teachers objected to this curriculum, her monitoring put her at odds with them. She also tracked portfolios of student work and the bulletin boards. To ease some of the friction, when teachers did not have mandated materials on bulletin boards, she would put them up for the teachers.

Kahlo teacher leaders also reported monitoring curriculum implementation. A teacher leader said "My job is pretty much to make sure that they stick to their script." She also mentioned that some teachers resisted change or had more problems than other to change their practices. In these cases she tried to approach the teachers by herself and then may ask the principal intervention.

Teacher leaders also participated in indirect monitoring through analyzing test scores and feeding back results to teachers.

Growth and Development of People

Teacher leader's main mode of helping teachers grow and develop was through individual coaching both in the classroom and during one-on-one and small-group

meetings. The same interactions that provided the information for monitoring also provided the opportunities for coaching. Twenty four teachers said that coaching was one of the main tasks teacher leaders performed. Unlike providing materials, coaching clearly influenced teaching, but coaching was different in each school. Most teachers reported that they had learned new teaching strategies as a result of teacher leader coaching.

At Lopez School, the math coach did not have much time because he taught in a bilingual classroom. Nevertheless, as timed permitted, he would model some strategies or provide time for teachers to visit other teachers' classroom. In addition, the teacher leader helped teachers with strategies to address a particular area that the teachers had difficulties with. He worked exclusively with the tested grades, emphasizing topics that needed coverage because they were on the state test. The Lopez science teacher leader worked with several schools so she was only there a few days a week and thus only reached a few teachers. Nevertheless, she modeled lessons and strategies and demonstrated how to use the new science kits.

The Kahlo coaches helped with teaching strategies. One saw and met all fourth grade teachers five periods a week: "My whole afternoon is teaching fourth grade…I'm actually in their room… they tell me either before I come into their room or right after… what [the lesson is about] or what they would like me to do. I might just go around working with a small group, helping them through the lesson." She helped teachers in their classrooms with children who had difficulty in math or by "team teaching as needed". In addition to helping in the classroom, teacher leaders worked with teachers as a group or individually discussing and reflecting on teaching strategies. She said, "At the

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end of a lesson, I'll stay and I'll talk with them… I make suggestions to them…I tell them ideas that they might want to try out…or if children are having trouble, I try to model ways of rephrasing…." Teachers reported gaining more confidence, especially with new materials, as a result of working with the leaders.

In Victorian, teachers reported that they met once a month in a half-day workshop with the teacher leader. During these workshops they would "troubleshoot" and also discuss the implementation of the curriculum. A teacher said:

> We all talk about what problems, trials and tribulations of teaching first year of Everyday Math. And that's been very helpful because you never want to be in a boat alone, especially if you think your boat's sinking. But in our case, we were all pretty much swimming and we were doing OK… You always want to monitor well, I'm only on chapter 6, where is somebody else? We're on chapter 8. So that all was taken care of by going to these meetings.

Teachers also reported that the teacher leaders helped them to ask higher order questions, explained each unit and how to use the materials that came with it, presented games, reflection activities, and math messages of the day. Teacher leaders modeled lessons as well. Most teachers saw explaining how to use the new textbook was perceived as very helpful. They said that the teacher leaders discussed individual units, assessment, and teaching strategies that went with them.

At Madera School, teacher leaders were assigned to a group grade levels. Only two teachers, who referred to the same teacher leader, said that the teacher leader assisted them with teaching strategies or "little suggestions".

Two factors affected how influential teacher leaders were. One was the knowledge they brought to their work, including both their content knowledge and their general experience as teachers. Martha was an especially influential teacher leader with thirty years of experience and two years as a math coach. With a major in math education and credits in a master's program towards math education, she has worked as a teacher and as consultant for a private testing company in teacher to teacher mentoring. Martha believed she established her legitimacy with other teachers not only because she had knowledge of math, but most importantly, because of her experience. As she put it: "I teach for some of the teachers…because I've taught it a lot of years. That's probably why I was assigned. I've taught math a long time so I'm pretty much can do a lesson pretty spontaneously."

Furthermore, Martha clearly expressed that her deep understanding of the math program allowed her to intervene in the classrooms as a team teacher and to effectively perform the coaching tasks. She said:

> [If] teachers are new to the [math program]; I've gone through the lessons already so I know the general idea and I know where they're headed. And I'll help them out or I'll get them started. I might model something for them if they're not that sure or if they're a little nervous.

In contrast, Britney in Sandyfield was the least experienced teacher leader in our sample; although she has been teaching for 10 years, she had only been teaching math and the fifth grade for 2 years. With a major in elementary education and sociology, Britney did not feel very knowledgeable about the new curriculum. The initiative to adopt the math curriculum had started with other teachers who had piloted the program earlier.

According to Britney they had more experience than she did with the program. Britney often asked one these teachers to help her prepare a lesson. Thus, although she had the title of teacher leader, she was still learning from her peers and not in a position to help others.

The other factor was teachers' modes of interaction as they worked with teachers in ways that combined both monitoring and coaching. Teacher leaders sought to share what they knew without positioning themselves as authorities, either in the sense of formal authority or more knowledgeable authority. Martha explained that she was "not a supervisor that's coming in and bossing them around or observing them where we all feel tense when we're being reported or observed or written up. But it's much more informal, my going in. And I know I don't see myself as going in as a disruption. If anything, it's like an extra set of hands or another pair of eyes observing or another experienced teacher helping."

Sometimes this meant finding ways to suggest teachers do things differently without being negative. Another teacher leader described situations where

I'll hear the teacher doing it. And I will walk up to them, pull them aside and I'll say, OK. Wait. Don't put the answers up so fast. Let's give them another 10 minutes. And again, just try to nudge them in that direction without saying, "No! no! You're doing it wrong." I'm not trying to criticize anyone. I'm trying to get them to move in a new direction.

Occasionally, teacher leaders would find that formal changes, like reassignments, would sunder the fabric of relationships they had developed. Then they would have to allow time for new relationships to develop. In the process, they might have to take

special steps to build relationships. One teacher leader said, "what we were asked to do was to select, after we had [provided training to teachers he did not know before] for a while, to select maybe one or two in that building that we felt would benefit from our support… But going into a building, I didn't want to slight anyone, so I would always try to see everybody and not make that one teacher feel that they were in need of me."

These statements by teacher leaders describe their modes of interaction negatively. More positively, what they have in common is respecting the autonomy and knowledge of the individual teacher, indicating that the teacher leader respects the value of that person in his or her interactions with that person.

The District and Teacher Leaders

These teacher leaders were largely the creatures of the districts. They occupied formal positions created by the districts to work with other teachers. The most important resource these positions provided was time, and the amount of time varied substantially across districts. Victorian's math coaches were full time while Sandyfield's teacher leaders had no release time but apparently much less expectation that they would help other teachers. In between, Riverside's math coaches were expected to teach at least one algebra class or work in several buildings.

The other constraints on teacher leaders' time point to crucial ambiguities in the teacher leadership role about both authority or purpose. Particularly in Riverside and Victorian, teacher leaders saw their general mission in much the same terms as the curriculum staff, as supporting the development of a particular approach to teaching

mathematics and science teaching. In Riverside, a math specialist said, "my goal is try to get them…to understand the deeper mathematics behind what they're teaching and also to get them to let the kids do more. To get them used to using manipulatives, get them off of drill and kill sheets." And a Victorian math coach said, "I would have to say some of the most effective [teaching strategies] would probably be actually having the students do the hands on, using the manipulatives… getting them to explore and get deeper into the math."

Yet, on a daily basis, they took orders from their principals. In both districts, teacher leaders were originally assigned to one building. In Victorian, the math coach reported to the principal and was initially quite loyal to that individual. He followed the principal's guidance about who needed his help but complained that he was assigned to monitoring lunch hour and other duties that had no relationship to improving mathematics teaching in the building. Apparently, to keep principals from making such assignments, the central office assigned math coaches to grade levels across buildings in the second year of field work. These reassignments had mixed results. They undermined the fabric of relationships that had developed with teachers and required more driving time.

In Riverside, too, math specialists were assigned to buildings, many of their day-to-day assignments came from principals. While the assignments described to us were more closely related to math and science teaching, they often got in the way of working with teachers. One specialist had to stop working with teachers at one point because, at his principal's request, she was spending so much time designing practice materials to prepare for the state test and coaching students after school. Thus, administrators gave

teachers time to work with other teachers but often also gave assignments that constrained such work.

Besides providing time, district leaders attended to the professional development of teacher leaders. The district helped teacher leaders become experts to whom teachers could turn and who would have knowledge to offer teachers. Describing the math supervisor in one district, a teacher leader said:

> I love her professional development activities always, she always presents some interesting, engaging problems and it kind of gives you the ideas where you can direct your questioning. New ways to look at old materials, old styles. And generally, when I see her, we'll discuss, I, when she comes in for observations, we meet in the teachers' room or I'll catch her in the hall and discuss my experiences with the teachers. It's always positive.

Teacher leaders described three kinds of professional development, two of which were most prevalent in Riverside and Victorian. The first was monthly meetings that might average as long as one day a month. These were often group sharing and problem solving sessions led by the district math or science curriculum supervisor. As described by teacher leaders, they covered three topics:

- working with difficult teachers—" Do we have teachers who are fighting us on it? The kind of teacher where, when we go in there to help them, they'll do Trailblazers, but as soon as you're not there for two or three days, they go back to handing out drill sheets,"

- learning about content and instruction—" A favorite lesson. Each week, somebody would bring in something that they've taught in a specific way, using a specific manipulative that they thought went very well," and

- issues related to testing—"we deal with test data."

The second was summer workshops. These were often week-long workshop. The Victorian coaches reported that two summers in a row, they spent five days, often in conjunction with teachers, learning about new curricula the district was implementing. Finally, teacher leaders would go to out-of-district events. Most teacher leaders went to some Math Science Partnership events. In Riverside, teacher leaders went to some national conferences as well. These activities helped teachers develop an understanding of their content area and the process of working with teachers that was deeper than that of other teachers and would help them both be of assistance to teachers and develop some legitimacy with them.

Conclusion

This paper describes how leadership is distributed in three districts engaging in mathematics and science reform. These districts represent somewhat special cases because of their participation in a university partnership. Moreover, our perspective is somewhat peculiar because of our focus on four schools. Nevertheless, we believe we offer two useful insights into how leadership is distributed between districts and teacher leaders.

The first is that ideas about distributed leadership suggest ways that teacher leaders can be integrated into an overall district reform effort. In these districts, teacher leaders complemented district leadership efforts. They participated in some of the same

leadership tasks as the district—i.e., procuring and distributing resources, monitoring progress, and developing people—but did so in a different way. The district often operated at a distance by setting rules and mandates and by procuring materials. It tended to be impersonal and distant, using formal authority dispassionate substitutes for leadership like the curriculum and testing to exercise influence. Teacher leaders moderated that distance by being more personal and closer and they deliberatively did so, in part to compensate they lack of formal authority. Some supervisors also sought to cultivate personal relationships too, but even more than teacher leaders, they lacked the time to do so.

Teacher leaders' capacity to play their complementary role depended on a variety of factors. One was the time they had. Teacher leaders who spent all their time teaching or tied up in other responsibilities, whether monitoring the lunch room or developing test preparation materials, could not work with other teachers. This was a cost factor for the district (and for principals). Freeing teacher leaders to work with teachers kept them from doing other things that might seem to have greater short-term benefits. Another was their own knowledge and expertise. They had to know more about teaching their subject matter and about the curriculum teachers were using to have something to offer teachers. A third was the relative emphasis on the tension between personal development v. monitoring. Teacher leaders needed to be in a position where teachers could know they were trusted. When they were doing too much monitoring, teachers were unlikely to trust them. Here the district had a conflict of interest, because it appeared to sometimes need teacher leaders to do both. Whether district leaders appreciated this conflict is unclear.

The second insight is that districts may be able to have more influence over teaching than had been thought in the past. There are indications that these districts were not only able to get teachers to comply with curriculum mandates—the sort of policy enforcement that Rowan and Miskel (1999)—suggested is possible. At least one district—Riverside—may have been able to shape teaching practice through a long-term program of professional development. The key here is that it was a program lasting several years and combining several leadership tasks and other elements. On the other hand, while teacher leader can complement district leadership, the specific role of the teacher leader did not appear to be necessary to district leadership. What was important necessary was in-class support to implement changes (Veenman, Denessen, Gerrits, & Kenter, 2001). In Riverside, that in-class support came from the district supervisor and the teacher leaders. In Sandyfield, it came from the district supervisor and from a math consultant who visited the schools often. While the teacher leaders lacked time and experience to influence teachers, teachers seemed to gradually change because of other sources of leadership. In Victorian, teachers depended largely on the teacher leader for everyday support since the district had a strong focus on monitoring and setting demands. The teacher leader seemed almost necessary at Victorian because teachers did not have direct communication with their supervisors.

This exploratory study analyzed the relationship between district and teacher leaders. We need research that goes farther to operationalize different leadership tasks from different actors and link them to changes in teaching practice. Ultimately, research is been needed across more district to ascertain the possibilities of distributed leadership

that includes districts, schools, and teacher leaders and the implications of such

leadership for the improvement of teaching and learning.

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[1] Some of this information is taken from Bulkely, Fairman, Martinez & Hicks (2004).

[2] Districts also supported individual course taking, but that was not part of the subject of this inquiry.