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Linking Leadership to Student Learning: The Contributions of Leader Efficacy

Kenneth Leithwood
Doris Jantzi

Purposes: *This study aimed to improve our understanding of the nature, causes and consequence of school leader efficacy, including indirect influences on student learning. We asked about district contributions to school leader efficacy, whether leader self- and collective efficacy responded to the same or different district conditions and the effects of leader efficacy on conditions in the school and the learning of students.*

Methods: *Evidence for the study was provided by 96 principal and 2,764 teacher respondents to two separate surveys, along with student achievement data in language and math averaged over 3 years. Path analytic techniques were used to address the objectives for the study.*

Findings: *In this study, school leaders' collective efficacy was an important link between district conditions and both the conditions found in schools and their effects on student achievement. School leaders' sense of collective efficacy also had a strong, positive, relationship with leadership practices found to be effective in earlier studies.*

Implications: *These results suggest that district leaders are most likely to build the confidence and sense of collective efficacy among principals by emphasizing the priority they attach to achievement and instruction, providing targeted and phased focus for school improvement efforts and by building cooperative working relationships with schools.*

Keywords: *Leader efficacy; collective efficacy; district leadership; student achievement*

INTRODUCTION

This study is part of a larger project aimed at better understanding how successful leadership effects student learning.¹ Because most leadership effects will be indirect, our task is to discover the many links in the chain connecting state, district and school leadership to learning. In this article we

report evidence suggesting that school-level leaders' individual and collective sense of efficacy for school improvement is one such link, a link significantly related to district leadership and other organizational conditions.

Sense of efficacy is a belief about one's own ability (self-efficacy), or the ability of one's colleagues collectively (collective efficacy), to perform a task or achieve a goal. It is a belief about ability, not actual ability. Bandura (1997a), self-efficacy's most prominent theorist, claims that:

People make causal contributions to their own functioning through mechanisms of personal agency. Among the mechanisms of agency, none is more central or pervasive than peoples' beliefs about their capabilities to exercise control over their own level of functioning and over events that effect their lives (p. 118).

Considerable evidence has now accumulated about the significant contributions that positive efficacy beliefs on the part of those in many different roles make to such important personal and organizational outcomes as job search success, increased task performance, improved attendance, and increased academic achievement (Prussia, Anderson, & Manz, 1998). In the case of teachers' individual efficacy beliefs, a small but impressive body of research indicates that it has large effects on both teacher performance and student outcomes (Tschannen-Moran & Hoy, 2001; Tschannen-Moran, Woolfolk Hoy, & Hoy, 1998). We are also beginning to learn from this research about the conditions that give rise to positive self-efficacy on the part of teachers (Tschannen-Moran & Barr, 2004) and other groups of non-school employees (Thoms, Moore, & Scott, 1996).

Efficacy is a key variable in better understanding effects in most organizations. Pointing to the similarity of efficacy and self-confidence, McCormick (2001) claims that leadership self-efficacy or confidence is likely the key cognitive variable regulating leader functioning in a dynamic environment. "Every major review of the leadership literature lists self-confidence as an essential characteristic for effective leadership." (p. 23). That said, we know very little about the efficacy beliefs of leaders, in particular (Chemers, Watson, & May, 2000; Gareis & Tschannen-Moran, 2005), and even less about the antecedents of those beliefs (Chen & Bliese, 2002). Designed to address this knowledge gap, our study asked four questions:

1. To what extent are district leadership and district organizational conditions related to school leaders' individual and collective sense of efficacy for school improvement? Are there differences in the antecedents of the two types of efficacy?

2. What is the relationship between leaders' efficacy and leader practices or behaviors, as well as school and classroom conditions?
3. What is the contribution of leaders' efficacy to variations in student learning?
4. Are the relationships between leaders' efficacy and student learning significantly moderated by personal or organizational characteristics?

FRAMEWORK AND LITERATURE

Adapted from our larger study, the framework for this article conceptualized district leadership and organizational conditions as two important categories of school leader efficacy antecedents, their influence on such efficacy moderated by a small number of organizational and individual leader characteristics. School leaders' efficacy beliefs are of two types—beliefs about one's self-efficacy for improving instruction and student learning (LSE) and beliefs about the collective capacity of colleagues across schools in the district to improve student learning (LCE). Both sets of efficacy beliefs were hypothesized to have significant effects on school leaders' practices or behaviors, conditions in schools and classrooms known to account for student learning, and student learning. Relationships among LSE, LCE, leaders' practices, school and classroom conditions, and student learning were assumed to be interactive.

To be clear, our framework takes the form of a causal model with hypothesized relationships among a series of variables. These variables form a chain eventually linked to student learning. In this section, we review prior evidence about each of these variables.

Leaders' Efficacy Beliefs

We conducted an extensive search for earlier evidence about LSE and LCE in both published and unpublished sources. This search confirmed our initial impression that formal inquiry about leader efficacy is in its infancy, although it seems to have been studied over a longer period of time in school (e.g., Dimmock & Hattie, 1996) than in nonschool contexts (Chemers et al., 2000). Those doing LSE research in other organizational contexts seem unaware of school-based leader efficacy research.

As Table 1 indicates, we were able to find 15 empirical studies carried out in school contexts, the earliest published by Hillman in 1983. In addition, we found 6 empirical studies of LSE conducted in other organizational contexts. Many more theoretical articles (e.g., Gist & Mitchell, 1992) and literature reviews (Sadri & Robertson, 1993) were identified and we used

TABLE 1
Methodological Features of Leader Efficacy Studies

Study	Design	Sample/Role	Achieved Sample	Efficacy Measure
School-based studies				
1. DeMoulin (1992)	Survey	Principals	212	CAI
2. Dimmock & Hattie (1996)	Survey	Principals	50	Primes
3. Gareis & Tschannen-Moran (2005)	Survey	Principals	588	PSES
4. Gill (1993)	Survey	Principals	Not available	Not available
5. Hernandez-Mezquita et al. (2001)	Survey	Principals	Not available	Author developed
6. Hillman (1983)	Surveys/outlier design	Schools	20	PES
		Teachers	35	
		Principals	19	
		Students	758	
7. Imants & De Brabander (1996)	Survey	Principals	121	
		Teachers	204	TPSE
8. King (2005)	Surveys	Principals	127	NGSS
9. Lloyd-Zannini (2001)	Surveys	Principals	129	PES
10. Lucas (2003)	Survey	Principals	89	Author developed
		Principals	74	
		Teachers	2356	
11. Lynn (2000)	Surveys	Principals and vice principals	183	Self-efficacy scale
12. Lyons & Murphy (1994)	Survey	Principals	121	Bandura based
		Principals	25	
		Teachers	not reported	

(continued)

TABLE 1 (continued)

Study	Design	Sample/Role	Achieved Sample	Efficacy Measure
13. Modlin (1996)	Survey Interviews	Principals Teachers	8 225	PES
14. Roberts (1997)	Surveys	Principals	3	SASES
15. Smith et al. (2003)	Survey	Principals	273	PSES
Nonschool based studies			284	
16. Chemers et al. (2000)	Surveys/ratings/ observations	Cadets Cadets	96 64	Murphy (1992)
17. Chen & Bliese (2002)	Surveys	Soldiers	2585	Author developed
18. McCormick (2000)	Nonequivalent control group	University students	280	Author developed
19. Paglis & Green (2002)	Surveys	Managers Employees	150 415	Bandura based
20. Pescosolido (2003)	Observations Surveys	MBA students	130	Author developed
21. Shea & Howell (1999)	Experiment	Grad. students	99	Bandura based

NOTE: Measures: PSES = Principal Sense of Efficacy Scale (18 items; Gareis & Tschannen-Moran, 2004); Prinses = Principals' Self-efficacy Scale (12 vignettes; Dimmock & Hattie, 1996); TPSE = The Teacher and Principal Sense of Efficacy scale (32 items); CAI = Career Awareness Index (100 items; DeMoulin, 1992); Murphy = based on Army Leadership Assessment Program (24 items); PES = Principal efficacy scale (Hillman, 1983); NGSS = New General Self-efficacy scale (Chen, Gully, & Eden, 2001); Self-efficacy scale (Sherer et al., 1982); SASES = The School Administrator Self Efficacy Survey (33 items; Rinehart, Gorrell, & Short, 1995).

them, in a selective way, to help us better understand the self-efficacy construct and what part it might play in the leadership process.

Table 1 indicates that data for most studies were provided through one-shot surveys. The only two studies using more sophisticated experimental or quasi-experimental designs were conducted in nonschool contexts (McCormick, 2000; Shea & Howell, 1999). All studies carried out in schools focused on the efficacy of principals, as did ours. Nonschool research examined the efficacy of managers, university students, and soldiers. Finally, a substantial variety of efficacy measures have been used in this research, although the majority has been designed to measure the construct as it has been conceptualized by Bandura.

Leaders' Individual or Self-Efficacy Beliefs

Most leader efficacy studies have been substantially influenced by Bandura's socio-psychological theory of self-efficacy (e.g., 1982, 1986, 1993, 1997a, 1997b). In addition to defining the meaning of self-efficacy and its several dimensions, this body of work identifies the effects of self-efficacy feelings on a leader's own behavior and the consequences of that behavior for others. This line of theory also specifies the proximal antecedents of self-efficacy beliefs and the mechanisms through which such beliefs develop.

Self-efficacy beliefs, according to such theory, have directive effects on one's choice of activities and settings and can affect coping efforts once those activities are begun. Such beliefs determine how much effort people will expend and how long they will persist in the face of failure or difficulty. The stronger the self-efficacy the longer the persistence. People who persist at subjectively threatening activities that are not actually threatening gain corrective experiences that further enhance their sense of efficacy. In sum, "Given appropriate skills and adequate incentives . . . efficacy expectations are a major determinant of peoples' choice of activities, how much effort they will expend and how long they will sustain effort in dealing with stressful situations" (Bandura, 1997a, p.77).

Bandura (1977) has conceptualized self-efficacy along three dimensions—complexity, generality, and strength. When tasks are ordered from simple to difficult, peoples' efficacy may be limited to relatively simple tasks or extend to the most difficult. Self-efficacy may be focused on very specific tasks (school improvement in our study, for example) or be more broadly conceived. One also may hold efficacy beliefs weakly or strongly, weakly held beliefs being easily extinguished in the face of difficulty.

Efficacy beliefs, suggests Bandura (1993), develop in response to both cognitive and affective processes. Among the strongest cognitive influences on self-efficacy are beliefs about ability as either inherent capacity or acquired skill. The inherent capacity view fosters a concern for protecting one's positive evaluation of one's competence. Those in leadership roles holding this view, for example, will experience an eroding sense of efficacy as difficulties arise, become more erratic in their problem solving, and lower their aspirations for the individuals or groups in their organization. These lowered aspirations then lead to declines in performance. The acquirable skills view, on the other hand, encourages the expansion of one's competence. Under this belief system, leaders' own self-judgments change very little in response to challenging circumstances. They will continue to set challenging goals for themselves and their colleagues and remain systematic and efficient in their problem solving. High levels of organizational performance are predicted by such behavior.

Also among the cognitive mechanisms influencing efficacy beliefs are perceptions about how controllable or alterable is one's working environment. This perception includes two components: one's ability to influence what goes on in the environment through effort and persistence, and the malleability of the environment itself. Bandura (1993) reports evidence suggesting that those with low levels of belief in how controllable their environment is produce little change even in highly malleable environments. Those with firm beliefs of this sort, through persistence and ingenuity, figure out ways of exercising some control even in environments with many challenges to change.

Self-efficacy beliefs also evolve in response to motivational and affective processes. These beliefs influence motivation in several ways: by determining the goals that people set for themselves (e.g., Locke & Latham, 1984); how much effort they expend; how long they persevere in the face of obstacles; and their resilience to failure. Additionally, motivation relies on both discrepancy reduction, as well as discrepancy production. That is, people are motivated both to reduce the gap between perceived and desired performance and to set themselves challenging goals, which they then work hard to accomplish. They mobilize their skills and effort to accomplish what they seek (Bandura, 1993). Leaders' beliefs in their own capacities affect how much stress and depression they experience in threatening or difficult situations.

Leaders' Collective Efficacy Beliefs

Collective efficacy is defined by Bandura as "a group's shared belief in its conjoint capabilities to organize and execute the courses of action required

to produce given levels of attainments" (1997a, p. 477). Although conceptually close to individual efficacy, research about the antecedents, nature, and consequences of collective (or group) efficacy is relatively recent. Results of that research in both schools (Goddard, Hoy, & Woolfolk Hoy, 2000, 2004; Ross, Hogaboam-Gray, & Gray, 2004; Tschannen-Moran & Barr, 2004; Tschannen-Moran & Goddard, 2001) and other types of organizations (Chen & Bliese, 2002; Pescosolido, 2003) indicate that it is a significant predictor of job attitudes, training proficiency, and job performance. In addition, it acts as a buffer to ameliorate the negative effects of work stressors on employees' psychological well being.

School-based research associates collective teacher efficacy with faculty trust in students and parents (Tschannen-Moran, 2001), as well as student achievement in math and reading (Goddard et al., 2000). Almost all of the available evidence about collective efficacy concerns groups of teachers or other employees not typically considered to be in leadership roles. So our focus in this study about the collective efficacy of school administrators in their district contexts is relatively unique.

Antecedents of LSE and LCE

According to Chen & Bliese (2002), the majority of organizational research has focused on the outcomes of efficacy beliefs, with much less attention devoted to inquiry about their antecedents. Pescosolido (2003) has argued, in addition, that the antecedents of LSE and LCE may well differ. For example, district leadership practices and organizational conditions may be a more proximal predictor of collective than individual efficacy because those behaviors only indirectly relate to the more proximal antecedents of individual efficacy such as role clarity and psychological states (Zaccaro, Blair, Peterson, & Zazanis, 1995).

Table 2 summarizes empirical evidence about the antecedents of both LSE and LCE and includes four categories—personal, school level, district level, and other.

Several conclusions are obvious from this table. First, no single antecedent has attracted much attention from researchers. Of the 33 listed in Table 2, 24 have been included in only one study. Second, the most frequently studied antecedents—leader gender (5 studies), leaders' years of experience (4 studies), level of schooling (4 studies) and compliance with policy or procedures (3 studies)—have still not attracted much evidence by any conventional social science standard. Third, what evidence there is about the impact on leader efficacy of those antecedents that have been studied suggests that it is either mixed or not significant. Finally, as far as we could determine, there

TABLE 2
Factors Influencing Leader Self-efficacy

Antecedents of LES	Sources of Evidence ^a	Nature of Relationship
Personal		
Leader gender	2, 3, 7, 12, 15	ns, ns, ns, ++
Race	3	ns,
Years experience	2, 3, 10, 12	ns, +, ns, +
Leader age	7, 12	ns, +
Future change in tasks	2	+
Current change in tasks	2	-
Retention of leadership in future (perceived)	2	+
Workload	1	-
Orientation to job	13	+
Leader self-esteem	19	+
<i>Successful leadership experience^b</i>	19	+
<i>Locus of control</i>	19	+
<i>Organizational commitment</i>	19	+
School/Unit level		
Location (urban, sub., rural)	2, 3	ns, ns
Level (elem., junior, second)	1, 2, 3, 12	ns, ns, ns, -,
Size	10, 15	+, +
Student SES	3, 15	ns, +
Teaching resources/materials	3, 19	+
Resource supply		+
Facilities	3	+
Student support	3	
Teacher support	3	
Staff support/subord. support	3, 19	+, +
<i>Salary</i>	1	+
<i>Subordinates' abilities</i>	19	+
<i>Subordinate cynicism</i>	19	-
District/head office level		
Superintendent	3	+
Central office staff	3	+
Leaders' job autonomy	19	+
Leadership training	18	ns
Parent support	3	
Other		
Quality of initial preparation	3	+
Utility of initial preparation	3	+
Number of relevant courses	12	ns

NOTE: ns = nonsignificant relationships; - = significant negative relationships; + = significant positive relationships.

^aThese numbers correspond to the citation numbers in Table 1. ^bVariables in italics were identified from research in nonschool contexts.

has been very little effort to understand district antecedents of school-level leader efficacy; only three studies have touched on this source, one in school contexts (Gareis & Tschannen-Moran, 2005) and two in other organizational sectors (McCormick, 2000; Paglis & Green, 2002).

Our conception of district antecedents was rooted in two bodies of evidence: research on organizational conditions and research on psychological dispositions. The first body of evidence was a summary of empirical research about the organizational conditions characteristic of effective districts (Anderson & Togneri, 2005; Leithwood, Riedlinger, Bauer, & Jantzi, 2003). These conditions included:

- A district-wide focus on student achievement and the quality of instruction (e.g., goals focused on student learning, programs aligned with state standards, support for the use of particular forms of instruction).
- District-wide use of data (e.g., capacity for reliably assessing student learning, use of such data in district decision making).
- Targeted and phased focuses for improvement (e.g., improvement efforts focused on clear goals, targeting specific areas of the curriculum and lower performing schools and classrooms).
- Investment in instructional leadership at the school and district levels (e.g., training for principals in school improvement processes, systematic and written appraisals of principals' performance).
- An emphasis on team work and professional community (e.g., foster flow of ideas through district, chances for principals to share knowledge with peers, support for teacher collaboration in schools).
- New approaches to board-district and district-school relations (e.g., find appropriate balance between local autonomy and central control).
- District culture (e.g., widespread understanding of district goals, values community partners, recognition of contributions).
- District-sponsored teacher professional development (e.g., focus on district priorities, intensive teacher development opportunities).

Although these conditions have been empirically associated with improvements in student learning, the original reason for including them in our larger project, they make unknown contributions to leader efficacy. We conceptualized them as distal antecedents in our study and one of our objectives was to shed light on their relationship with the more immediate antecedents included in Bandura's theory—mastery experiences, vicarious experiences, social persuasion, and emotional arousal processes. This is the second body of evidence mentioned above. Mastery experiences, or individual past successes and failures with a task, will have strong effects on feelings of self-efficacy for accomplishing similar future tasks. School leaders might have mastery experiences, for example, from participation in some form of district professional development, opportunities to solve

manageable problems in their schools and districts, and working with a mentor. Vicarious experiences may arise through the visualization of successful performance. Such experiences may also be a product of observing a skilled model (e.g., a district administrator; Coffin & Leithwood, 2000) mastering an important task or skill or by hearing about how other leaders have solved relevant organizational problems.

Verbal persuasion includes encouragement and feedback from a credible, trusted, and respected colleague. We speculate that performance appraisal feedback from central office leaders might serve as a form of verbal persuasion influencing school leaders' efficacy beliefs. Bandura argues that performance feedback "focused on achieved progress underscores personal capabilities whereas feedback that focuses on shortfalls highlights personal shortcomings" (1977, p. 199). Finally, emotional arousal may occur in response to an inspirational other (e.g., a charismatic district leader) who helps elevate leaders' standards and aspirations and helps them see the relationship between the district's goals and larger social and moral purposes. District conditions are likely to be antecedents of leader efficacy to the extent that they influence one or more of the four immediate sources of efficacy identified by Bandura.

SUCCESSFUL LEADERSHIP

Because our study inquired about the links between leadership and student learning, it demanded a robust conception of leadership on which to base its measures of this construct. Our framework suggests that for district leaders, these practices contribute to school leader efficacy; school leader efficacy, in turn, will influence school leader practices. Evidence from district, school and noneducation organizations (Leithwood & Jantzi, 2005; Leithwood & Riehl, 2005) points to three categories of successful leadership practices which are broadly useful across many organizational contexts although exactly how they are enacted will vary by context. Such practices are the core of successful leadership and served as the conception of both district and school leadership measured in this study. Hallinger and Heck (1999) label these categories of leader practices purposes, people, and structures and social systems. Conger and Kanungo (1998) speak about visioning strategies, efficacy-building strategies, and context changing strategies. Leithwood, Jantzi, and Steinbach's (1999) categories are setting directions, developing people, and redesigning the organization. We added a fourth category to acknowledge the important contribution that good management makes to organizational effectiveness. Within each of these

similar categories of practice are numerous, more specific competencies, orientations, and considerations; for example, most of the specific leadership responsibilities linked to student learning in Waters, Marzano, and McNulty's (2003) meta-analysis fit within these categories. .

Setting Directions

A critical aspect of leadership is helping a group develop shared understandings about the organization (the district, the school) and its activities and goals that can undergird a sense of purpose or vision (e.g., Hallinger & Heck, 2002). To the extent that visions are inspirational, they should foster those emotional arousal processes antecedent to the development of efficacy beliefs. The most fundamental theoretical explanations for the importance of direction-setting practices on the part of leaders are goal-based theories of human motivation (e.g., Bandura, 1986; Ford, 1992; Locke, Latham, & Eraz, 1988). According to such theory, people are motivated by goals which they find personally compelling as well as challenging but achievable. Personal goals with such properties are critical to the development of efficacy (Locke, Frederick, Lee, & Bobko, 1984).

Both task direction and goal setting are leader behaviors empirically associated with the development of self-efficacy beliefs (Earley & Lituchy, 1991; Prussia et al., 1998). Often cited as helping set directions are specific practices such as identifying and articulating a vision, fostering the acceptance of group goals, and creating high performance expectations. Visioning and establishing purpose also are enhanced by monitoring organizational performance and promoting effective communication and collaboration.

Developing People

Although clear and compelling organizational directions contribute significantly to members' work-related motivations, they are not the only conditions to do so. Nor do such directions contribute to the capacities members often need to productively move in those directions. Such capacities and motivations are influenced by the direct experiences organizational members have with those in leadership roles (Lord & Maher, 1993), as well as the organizational context within which people work (Rowan, 1996). The ability to engage in such practices depends, in part, on leaders' knowledge of the technical core of schooling—what is required to improve the quality of teaching and learning—often invoked by the term instructional leadership. But this ability also is part of what is now being referred to as leaders' emotional intelligence (Goleman, Boyatzis, & McKee, 2002).

District leaders' efforts to develop school leaders seem likely to have an important influence on school leaders' mastery experiences. District leaders' provision of feedback and encouragement is a potential source of vicarious experiences for school leaders. More specific sets of leadership practices significantly and positively influencing these direct experiences include offering intellectual stimulation, providing individualized support, and providing an appropriate model. Developing people, in other words, includes professional development and much more.

Redesigning the Organization

This dimension of district leadership potentially bears on all four of Bandura's proximal sources of efficacy beliefs. It has this potential, for example, when it encourages participation in district decisions and creates opportunities for collaborating with other school leaders. This set of leadership practices has emerged from recent evidence about the nature of learning organizations and professional learning communities and their contribution to staff work and student learning. Such practices assume that the purpose behind organizational cultures and structures is to facilitate the work of organizational members, and the malleability of structures should match the changing nature of the school's improvement agenda. Specific practices typically associated with this category include strengthening district and school cultures, modifying organizational structures, and building collaborative processes. Nicolaidou and Ainscow's (2002) study of failing schools provides strong confirmation of the importance of collaborative cultures, especially staff collaboration, to effective school improvement.

Managing the Instructional Program

Practices included in this category aim to establish stable routines, structures, and procedures in the district and school thereby providing the infrastructure for change. Evidence about the impact of this set of practices at the school level remains contradictory. Hallinger (2003) indicates that among the three major categories of practices in his model, this category has the weakest influence on measured outcomes. In contrast, practices in this leadership category have demonstrated significant effects on student achievement (Leithwood et al., 2003). Specific practices included in this category include: planning and supervising instruction; providing instructional support; monitoring the school's progress (including student progress); and buffering staff from external demands unrelated to the school's priorities.

TABLE 3
Consequences of Leader Efficacy

Factors	Sources of Evidence ^a	Nature of Relationship
<i>Personal</i>		
Type of power used:		
- coercive, reward, legitimate	12	-
- expert, information, referent	12	+
Task preference	7	+
Compliance with policy/procedure	5, 9	+, ns, +
Role innovation	4	ns
Perfectionism	8	-
State/trait anxiety	9	-
Conflict management style	14	+
Motivation to lead change (attempts to change)	19	+
Leadership performance	16	+
Interpretation of task feedback	21	+
<i>School/ work unit</i>		
Teacher implementation	10	+
Teacher motivation & behavior	13	ns
Student achievement	6	ns
Willingness to continue as group	20	+
Individual learning & self-development	20	+
Ability to work independently as a group member	20	+

^aThese numbers correspond to the numbers assigned citations in Table 1.

Consequences of Leader Efficacy

Table 3 summarizes prior evidence about the effects of leader self- and collective efficacy combined. As with leadership antecedents, there has been little accumulation of evidence about any single effect or consequence and results to date are decidedly mixed. Our own study examined the influence of leader efficacy on leader behavior, on the school and classroom conditions that we judged to have the greatest impact on student learning (Leithwood, Louis, Anderson, & Wahlstrom, 2004) and on student learning itself.

School Conditions

Our initial review of literature for the overall project (Leithwood et al., 2004) identified five broad sets of school conditions, each including multiple more specific variables, significantly contributing to student learning. These were school structures (3 variables), school cultures (2 variables),

instructional policies, instructional practices (3 variables), and human resources (2 variables). Because we could not adequately measure all of these school conditions in the time available for our teacher survey, four were chosen to sample the status of school conditions:

- School culture (minimize disruptions to instructional time, shared beliefs and values, students feel safe in the school).
- Decision making processes (e.g., teachers' participation, feedback to teachers about instructional practices, autonomy in the classroom decisions, teacher input into school plans).
- Supports for instruction (e.g., adequate time for professional development, sufficient support for students with special needs, adequate curriculum materials).
- Professional learning community (four of the five interconnected variables in Louis and Kruse's [1995] conception of professional learning communities—shared responsibilities, beliefs about teaching and learning, deprivatized practice, and reflective dialogue).

Classroom Conditions

Our initial review (Leithwood et al., 2004) also identified six sets of classroom conditions with significant effects on student learning. The teacher survey sampled classroom conditions by asking about the status of four conditions (omitting attention to class size and homework):

- Workload (e.g., manageable numbers of students, manageable number of subjects taught, access to teaching assistance when needed).
- Areas of formal preparation (e.g., teaching subjects in which I am formally prepared, teaching grade levels for which I am formally prepared).
- Student grouping (e.g., group students according to need, depends on instructional purposes).
- Curriculum and instruction (e.g., sufficient written curricula on which to base lessons, enable students to construct their own knowledge, school has a rigorous core curriculum for most students).

METHODS

Sampling

Stratified random sampling procedures were used to select schools (180) within districts (45) within states (9). State sampling, carried out first, aimed to ensure variation in geography, demographics, state governance for

education, curriculum standards, leadership policies, and accountability systems. District sampling within the 9 states aimed at variation in district size and student diversity (e.g., race/ethnicity, family income), as well as trends in student performance on state accountability measures. Within the 45 districts, schools were sampled to ensure variation in school level (elementary, middle, and secondary), student diversity, and evidence of success in improving student achievement over 3 or more years. All teachers and principals in each school were asked to complete the surveys.²

Instruments

This article is based on evidence from a subset of items included in two surveys, one for teachers and one for principals. These surveys were used for the first round of data collection in our larger study between April 2005 and February 2006. The development of both surveys began with existing items and scales which both sets of principal investigators had used in their previous research (e.g., Leithwood, Aitken, & Jantzi, 2001; Louis, Marks, & Kruse, 1996) and were suitable for measuring many of the variables in our framework. Beginning with a pool of approximately 400 items from these sources, we eventually produced a 134-item principal survey, requiring about 30 minutes to complete, and a 104-item teacher survey requiring about 20 minutes. Final refinements to these two surveys were suggested by focus groups of principals and feedback from the administration of the instruments.

Data for this article were provided by 58 items from the principal survey (measuring district variables) and 56 items from the teacher survey (measuring school and classroom variables). Principal survey items measured LCE (4 items), LSE (6 items), district conditions (30 items) and district leadership (18 items). Three variables were measured with the teacher survey—school leadership (20 items), class conditions (15 items), and school conditions (21 items). The distribution of variables to be measured across the two surveys was based on judgments about which set of respondents (teachers or administrators) were most likely to have the most authentic information about each variable. This procedure also reduced the threat of same-source bias in our results.

Previous efforts to develop adequate measures of leader efficacy beliefs have failed to produce instruments completely suitable for our purposes. Gareis and Tschannen-Moran (2004), for example, describe many of these previous efforts and report results of their research on the validity and reliability of the following:

- A promising, vignette-based, measure of individual leader efficacy developed by Dimmock and Hattie (1996).
- A 22-item adaptation of a measure of collective teacher efficacy originally developed by Goddard et al. (2000).
- A 50-item adaptation of a measure of individual teacher efficacy (eventually reduced to 18 items) initially developed by Tschannen-Moran and Hoy (2001).

The authors reported disappointing results of their tests of the factor structures of the first two instruments but the third measure proved to be more satisfactory in terms of both its factor structure and construct validity. Three factors emerged from the results: self-efficacy for handling managerial aspects of the job, instructional leadership tasks, and moral leadership tasks.

Because of the focus in our larger study on leaders' influence on student learning, we incorporated into our principal survey the six-item scale measuring feelings of self-efficacy about instructional leadership tasks. We interpreted these items to be measuring efficacy for school improvement. The six items, beginning with the stem "To what extent do you feel able to . . ." are listed below:

1. Motivate teachers?
2. Generate enthusiasm for a shared vision of the school?
3. Manage change in your school?
4. Create a positive learning environment in your school?
5. Facilitate student learning in your school?
6. Raise achievement on standardized tests?

A new four-item scale was developed for the principal survey to measure leaders' collective efficacy beliefs about school improvement. The items, beginning with the stem "To what extent do you agree that . . ." are listed below:

1. School staffs in our district have the knowledge and skill they need to improve student learning?
2. In our district, continuous improvement is viewed by most staff as a necessary part of every job?
3. In our district, problems are viewed as issues to be solved, not as barriers to action?
4. Central district staff communicates a belief in the capacity of teachers to teach even the most difficult students?

Previous studies of school leader efficacy have measured the effects of a number of possible demographic variables but without much effort to

explain why such variables might influence sense of efficacy. Few of these variables have demonstrated a significant influence on leader efficacy. Personal characteristics measured in our study included leader race/ethnicity, gender, years experience as a school administrator, and years experience in one's current school. We also measured a handful of organizational characteristics plausibly related to leader efficacy including school and district size, school level, and number of different principals in the school over the past 10 years.

Data used to measure student achievement across schools were collected from state Web sites, as in the case of our companion study in this issue (Leithwood & Mascall). These data were school-wide results on state-mandated tests of language and mathematics at several grade levels over 3 years (2003 to 2005). 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 to increase the stability of scores (Linn, 2003), resulting in a single achievement score for each school for each of 3 years. We also computed an achievement change score; this was calculated as the gain in percentage of students attaining or exceeding the state-established proficiency level from the first to the third year for which we had evidence.

Data Analysis

Data used for this study were individual teacher responses to the teacher survey aggregated to the school level that were then merged with principal responses to the school administrator survey. SPSS was used to calculate means, standard deviations and reliabilities (Cronbach's alpha) for scales measuring variables of interest to this study. Five types of analyses were carried out to answer questions raised in this study. Pearson product correlations were calculated to estimate the strength of relationships between variables in the model. Standard multiple regression was used to determine the effects of a specific variable that is different from the effects of other independent variables (e.g., the differing effects of LSE and LCE on school conditions). Hierarchical multiple regression was used to examine the effects of particular variables or sets of variables on the dependent variable after controlling for the effects of other variables (e.g., how the effects of district conditions on principal efficacy are moderated by district size). A *t*-test was computed to determine the significance of leader gender and analyses of variance (oneway ANOVA) were used to determine the significance of school level and leaders' race/ethnicity.

TABLE 4
Means, Standard Deviations and Scale Reliabilities for Variables Measured
on the Teacher and Principal Surveys (N = 96)

	Mean	SD	Reliability	Number Items
L collective efficacy	4.80 ^a	.82	.79	4
L self-efficacy	4.03 ^b	.58	.88	6
District conditions	4.78	.72	.92	30
District leadership	4.80	.85	.89	18
School leadership	4.55	.52	.95	20
School conditions	4.10	.46	.83	21
Classroom conditions	4.69	.25	.60	15

^aRating scales: 1 = strongly disagree to 6 = strongly agree for all but the following variable.

^bRating scales: 1 = very little to 5 = very great.

LISREL (linear structural relations) was used to test a model of the causes and consequences of school leader efficacy. This path analytic technique allows for testing the validity of causal inferences for pairs of variables while controlling for the effects of other variables. Data were analysed using the LISREL 8 analysis of covariance structure approach to path analysis and maximum likelihood estimates (Joreskog & Sorbom, 1993).

RESULTS

Questions motivating our research were about (a) district antecedents of school leaders' efficacy and possible differences in the antecedents of individual as compared with collective leader efficacy, (b) consequences of school leader efficacy for leader behavior, as well as school and classroom conditions, and (d) effects of leader efficacy on student learning. We also examined the moderating effect of a handful of demographic variables.

Table 4 reports the means, standard deviations, and scale reliabilities for responses to both the teacher and principal surveys. These data are based on responses from 96 schools and administrators (an 83% response rate) and 2764 teachers (a 66% response rate). Table 5 reports achievement data aggregated across all schools with complete data (*Ns* vary for this reason) including the mean proportion of students at or above state-established proficiency levels for each of 3 years.

In this section we report the results of our analyses, a series of correlations, and regressions followed by a path model. Our data do not permit us to make strong claims about cause and effect relationships. Nonetheless, we

TABLE 5
Means and Standard Deviation for Student Achievement Measures

	Mean	SD	N
Achievement gain	3.40%	8.22	77
2003 Proficiency	66.06%	23.85	78
2004 Proficiency	67.88%	23.98	79
2005 Proficiency	71.77%	22.41	67

use the language of effects throughout as an indication of the nature of the relationships in which we were interested.

District Antecedents of School Leader Efficacy

District Leadership

As Table 6 indicates, our aggregate district leadership variable was strongly related to LCE (.61) and significantly but moderately related to LSE (.32). Among the four dimensions included in our conception of district leadership, the strongest relationship with LCE was redesigning the organization (.61) followed by developing people (.55), managing the instructional program (.53) and setting directions (.42). With LSE, the strongest relationship was with managing the instructional program (.34) followed by redesigning the organization (.28), developing people (.27), and setting directions (.23).

Results of a standard regression analysis show that our aggregate measure of district leadership (using the adjusted *R*) explains 15% of the variation in LSE, half of which is accounted for by managing the instructional program; it also explains 27% of the variation in LCE, of which significant contributions are made by redesigning the organization (6%) and managing the instructional program (4%).

District Conditions

All eight sets of district conditions are significantly related to leader efficacy, strongly so with LCE. The strongest relationship with LCE is the district's expressed concern for student achievement and the quality of instruction (.66), followed, in order, by district culture (.61), targeted and phased focus of improvement (.61), new approaches to board-district and district-school relations (.58), emphasis on teamwork and professional community (.57), district-wide use of data (.52), investment in instructional

TABLE 6
District Antecedents of School Leader Efficacy:
Correlation Coefficients (N = 96 schools)

	LCE	LSE	Combined
District leadership	.61**	.32**	.56**
Setting directions	.42**	.23*	.39**
Developing people	.55**	.27**	.49**
Redesigning the organization	.61**	.28**	.54**
Managing instruct. program	.53**	.34**	.52**
District conditions	.68**	.44**	.68**
Focus on quality	.66**	.40**	.63**
Use of data	.52**	.35**	.52**
Targeted improvement	.61**	.33**	.56**
Investments in instructional leadership	.51**	.25*	.46**
Job-embedded professional development	.40**	.35**	.45**
Emphasis on teamwork	.57**	.45**	.60**
New school relations	.58**	.36**	.56**
District culture	.61**	.39**	.60**

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

leadership at the district and school levels (.51), and district-sponsored, job-embedded professional development focus for teachers (.40).

Relationship between district conditions and LSE are generally weaker, although still statistically significant. The strongest of these relations is with the emphasis on teamwork (.45) followed by a focus on achievement and the quality of instruction (.40), district culture (.39), district-wide use of data (.35), job-embedded professional development for teachers (.35), new district-school relations (.36), targeted and phased focus of school improvement (.33), and investment in instructional leadership (.25).

Standard regression analyses indicate that the aggregate measure of district conditions explains 19% of the variation in LSE and 46% of the variation in LCE. Among the eight sets of specific conditions included in our district variable, significant contributions to explained variation in LSE were made by teamwork (19% of variation), focus on achievement and instructional quality (15%), district culture (14%), district-school relationships (12%), professional development for teachers (12%), data use (11%), targeted and phased improvement (10%), and instructional leadership (5%). For LCE, contributions to overall explained variation were: focus (42%), phased improvement (36%), district culture (36%), relationships (33%), teamwork (31%), data use (26%), instructional leadership (25%), and professional development (15%).

TABLE 7
Leader Efficacy Relationships with School Leader Practices and School
and Classroom Conditions (*N* = 96 schools)

	LCE	LSE	Combined
School leadership	.20	.33**	.31**
Setting directions	.20*	.40**	.35**
Developing people	.18	.25*	.26*
Redesigning the organization	.23*	.31**	.31**
Managing instruct. program	.14	.31**	.26*
School conditions	.42**	.38**	.47**
Classroom conditions	.36**	.30**	.39**

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

Effects of Leader Efficacy on Leader Behavior, School and Classroom Conditions

Table 7 reports correlations between LSE, LCE, an aggregated measure of efficacy and leader behavior, school conditions, and classroom conditions. The strongest relationships are between school conditions and aggregated efficacy (.47) followed closely by the relationship between classroom conditions and aggregated efficacy (.39). Correlations between school leader practices and both aggregated efficacy and LSE are comparable (.31 and .33). LSE has substantially higher correlations with leader behavior than does LCE. Correlations between LSE and the four separate dimensions of leader behavior included in our study are roughly similar, ranging from a low of .25 (developing people) to a high of .40 (setting directions); for LCE, the range is between .14 (managing instruction) and .23 (redesigning the organization).

Standard regression equations were used to estimate the effects of LSE, LCE and an aggregate measure of efficacy on leader behavior as well as school and classroom conditions. The aggregate efficacy measure explained 8% of the variation in leader behavior, LSE explained 10%, and LCE had no unique effect. Both forms of efficacy combined explained more variation in school (21%) and classroom (15%) conditions than did either separately; when examined separately, LSE explained slightly more of the variation in school conditions (16% and 13%) and classroom conditions (12% and 8%).

Effects of Leader Efficacy on Student Achievement

Table 8 reports correlations between alternative estimates of student achievement and our three leader efficacy measures. LSE is not significantly

TABLE 8
Leader Efficacy Relationships with Mean Achievement Gain and Percentage
of Students at State Proficiency Level

	LCE	LSE	Combined
Mean achievement gain ($N = 77$)	-.03	.13	.05
Proficiency 2003 ($N = 78$)	.33**	.16	.28*
Proficiency 2004 ($N = 79$)	.29**	.12	.24*
Proficiency 2005 ($N = 67$)	.23	.21	.25*

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

related to any of the estimates of student achievement. However, there are consistent and significant relationships with each year's annual achievement scores (% of students achieving at or above the proficient level) for our other two efficacy measures. Two of the three annual achievement scores are significantly related to LCE (.33, .29). All three annual achievement scores are significantly related to our aggregate efficacy measure (.28, .24, and .25).

Results of a regression analysis indicate that neither LCE alone, LSE alone, or an aggregate efficacy measure account for significant variation in the 3-year mean student achievement change score. Leader efficacy, however does explain significant variation in annual achievement scores. The aggregate efficacy measure and LCE explain comparable amounts of variation in achievement scores for 2003 (7 and 9%), and 2004 (5 and 7%). In 2005 only the aggregate efficacy measure explained significant variation in student annual achievement scores (5%). LSE alone had no significant explanatory power.

Moderating Variables

The variables we designated as moderators have potential effects on the relationship between district leadership, district conditions, and leader efficacy. Potentially, they may also moderate the relationship between leader efficacy and conditions in the school and classroom as well as the relationship between leader efficacy and student achievement. Our results indicated that some potential moderators had no influence on either set of relationships; this was the case for leader gender, experience, and race/ethnicity, so we do not consider them further. On the other hand, district size, school size, school level, and number of principals in the school over the last 10 years were significant moderators of the relationship between efficacy and conditions in the class and school along with student achievement. District-leader efficacy relationships were unaffected by any of our potential moderators.

To estimate the effects of the four remaining variables on efficacy, school, and student relationships, we entered both types of leader efficacy, as well as the combined efficacy measure, first into a series of regressions equations, adding district size, school size, school level, and number of principals in the school over the last 10 years next. As a group, these moderators:

- Increased the variation in leader behavior explained by both sources of efficacy combined from 8% to 21%, by LSE alone from 10% to 22%, and by LCE alone from 3% to 17%.
- Increased the variation in school conditions explained by both sources of efficacy combined from 21% to 36%, by LSE alone from 13% to 28%, and by LCE alone from 16% to 34%.
- Increased the variation in class conditions explained by both sources of efficacy combined from 15% to 30%, from LSE alone from 9% to 24%, and from LCE alone from 12% to 31%.
- Increased the variation in student annual achievement scores explained by both sources of efficacy from 5% to 8% and from LCE alone from 7% to 11%.

The moderators did not add to the variation in student achievement explained by LSE.

School level and district size contributed unique variation to many of these relationships and should be considered the most powerful of the moderators included in this study. Both of these moderators depressed the strength of the relationships in which they were significant. In other words, the contribution of both LSE and LCE to most of the relationships with which they were associated were muted by increased district size and in secondary schools as compared with elementary schools.

THE CAUSES AND CONSEQUENCES OF SCHOOL LEADERS' EFFICACY BELIEFS: TESTING A MODEL

Figure 1 summarizes the results of testing a model of the causes and consequences of leader efficacy beliefs using path modeling techniques (LISREL). Only significant relationships are shown in this figure. The model is an acceptable fit with the data ([Chi-square = 13.88, $df = 13$, $p = .38$], RMSEA = .00, RMR = .05, GFI = .96, AGFI = .89 and NFI = .97). The GFI drops below the .90 criterion when sample size of 79 schools with achievement data is taken into account. The model indicates that the most direct effects (standardized regression coefficients) of district leadership are on the creation of those district conditions believed to be effective in producing student learning (.77); these district leadership effects account for 60% of

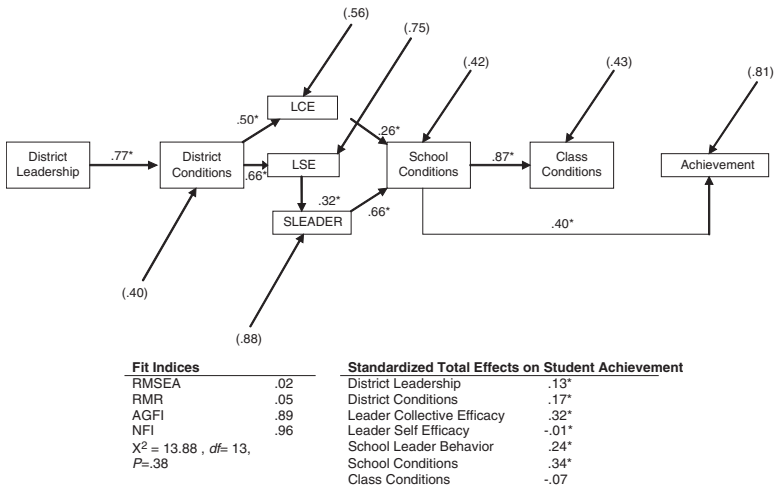


Figure 1. Modeling the Relationship Among Variables Related to Collective and Self Efficacy

NOTE: RMSE = Mean Square Error of Approximation, RMR = Root Mean Square Residual, AGFI = Adjusted Goodness of Fit, NFI = Normed Fit Index. For a full explanation of these fit indices see Byrne, B. *Structural Equation Modeling with LISREL, PRELIS and SIMPLIS*. Mahwah, NJ: Lawrence Erlbaum.

*Relationships are significant at .01 level.

the variation in district conditions. District conditions, in turn, influence both LCE (.50) and LSE (.66); 44% of the variation in LCE and 25% in LSE is explained by the effects of district conditions.

LCE is moderately associated with school conditions (.26) but LSE has no such association. LSE explains 12% of the variation in leader behavior. Together, LCE and leader behavior explain and 58% of the variation in school conditions. The model suggests both direct effects of school conditions on student learning (.40), as well as indirect effects through classroom conditions (.87) even though there is a nonsignificant relationship between class conditions and achievement; school conditions explain 57% of the variation in class conditions. The model as a whole explains 19% of the variation in student achievement.

Most of these results seem reasonable, the exception being the behavior of classroom conditions. Our analysis produced a nonsignificant and negative direct relationship between class conditions and student learning. We

have no firm explanation for this surprising result but the marginal reliability of the scale used to measure classroom conditions ($\alpha = .60$) may be part of the answer.

DISCUSSION AND CONCLUSION

Our study addressed four sets of questions. First, we asked about the extent to which district leadership and district organizational conditions influenced school leader efficacy. Our results indicate a quite strong influence from these sources and suggest, further, that the effects of district leadership are largely indirect; they help to create district conditions that are viewed by school leaders as enhancing and supporting their work. All four dimensions of district leadership were moderately to strongly related to LCE, arguing for district leader adoption of a holistic approach to their own practice. It is not enough to just provide a compelling vision for the district organization, to provide opportunities for capacity development, to put structures and cultures in place which foster collaborative work, or to manage the instructional program of the district well. The greatest effect of district leaders will be the outcome of engaging in all four sets of practices in a skilful manner.

That said, our results point to the relatively weak contribution of setting directions, a surprising results because previous research has usually found it to be the most powerful source of leader effects (Hallinger & Heck, 1998; Leithwood & Jantzi, 2005). School leader efficacy-building on the part of district leaders, our evidence suggests, is most closely associated with their efforts at organizational redesign (e.g., building collaborative cultures and the structures which encourage collaboration). The efficacy of school leaders, it would seem, arises less from direction and inspiration and more from the aligned and supportive nature of their working conditions. Future research would do well to inquire more deeply into the leadership behaviors of district administrators that nurture a sense of efficacy and confidence on the part of school leaders.

Organizational conditions, we also found, had much larger effects on school leaders' collective than individual efficacy, providing some confirmation for Chen and Bliese's (2002) expectation that such difference would likely exist. This expectation is based on the assumed proximal influence of organizational conditions on collective efficacy but only distal influence on individual efficacy. Common to both types of efficacy, however, was the strong influence of the district's focus on student learning and the quality of instruction, as well as district culture. These mutually reinforcing district conditions seem likely to focus the collective attention of school leaders on

the district's central mission. Also common to both types of efficacy, and likely a surprise to some, is our discovery that the relationships between district investments in developing instructional leadership and both types of leader efficacy were the weakest of the relationships tested. Furthermore, district investments in instructional leadership were a substantially greater influence on leaders' collective efficacy than on their individual efficacy. Perhaps the effect of such an investment by districts has greater symbolic than instrumental value, signifying the district's commitment to improving learning more than the actual development of greater capacity for the task. This conjecture on our part certainly warrants more direct study.

A second set of questions asked about the effects of school leaders' efficacy on their leadership practices and on both school and classroom conditions. We found a modest effect of our aggregate measure of efficacy on school leader behavior, mostly accounted for by individual efficacy. There was a stronger, though still moderate, effect of aggregate leader efficacy on both classroom and (especially) school conditions. Collective efficacy explained most of this variation.

The relationships between leaders' efficacy and behavior were weaker than we expected. One plausible explanation is that our measure of leader behaviors or practices did not adequately capture the consequences of different levels of efficacy (or confidence) on what leaders do and how they are perceived. These consequences may have less to do with the practices themselves and more to do with the style of their enactment (e.g., acting with assurance, displaying a confident attitude, remaining calm in the face of crises). Subsequent research about leader efficacy should attend to stylistic differences in the enactment of core leadership practices.

In addition, we found weak but significant effects of leader efficacy on one of our two indicators of student learning: the proportion of students in schools reaching or exceeding the state's proficient level. These effects are most certainly indirect though their effects on school and classroom conditions and the size of these effects is comparable with what has been reported from other studies of school leader effects on learning and other student outcomes (Hallinger & Heck, 1996; Leithwood & Jantzi, 2005).

Finally, our results indicate that leader efficacy effects are significantly moderated by a handful of organizational characteristics but by none of the personal variables included in our study (i.e., leaders' gender, experience, race, or ethnicity). The moderating organizational characteristics are to be expected. District size and school size almost always make a difference no matter the focus of research (e.g., Lucas, 2003; Smith, Guarino, Strom, & Reed, 2003; Walberg & Fowler, 1987). Elementary schools are typically more sensitive than secondary schools to leadership influence, although

previous leader efficacy research has reported mostly nonsignificant effects (DeMoulin, 1992; Dimmock & Hattie, 1996). And the rapid turnover of principals has been widely decried as anathema to school improvement efforts (Hargreaves & Fink, 2006; Macmillan, 1996). Now we have some evidence that the positive effects of leader efficacy are also muted in large schools and districts, in secondary schools, and in contexts of rapid leader succession.

The nonsignificant effects of our personal moderators—leader gender, experience, race, and ethnicity—are more surprising than the significant moderating effects on leader efficacy of organizational characteristics. Our evidence seems to imply that similar displays of efficacy and confidence on the part of males or females, experienced or inexperienced, and majority or minority member leaders are interpreted in much the same way by their faculty. These results clearly do not support common claims about the discrimination experienced especially by women and/or minority principals.

We situated this article at the outset as part of a larger effort to discover significant links in the chain joining successful leadership practices with student learning. With suitable acknowledgements to the correlational nature of the data, our results begin to suggest that school leader efficacy—especially collective efficacy—may be one such link. These results also begin to point back to the significant effects on school leaders' efficacy of district leadership and other district organizational conditions, thereby offering us some clues about how state leadership and broad educational policy effects eventually find their way into schools through the work of district leaders.

The nature of the evidence pointing to these clues is important to recognize. Until now, almost all of the evidence available about the characteristics of effective districts has come from small numbers of cases considered to be outliers by virtue of reputation or prior levels of student achievement (Anderson & Togneri, 2005). This study provides different, quantitative, and relatively robust evidence confirming the conclusions of much of this case-based, qualitative research. In addition, it offers insights about why those district characteristics are important—at least partly because of their contribution to school leader efficacy.

NOTES

1. This study is part of the larger project *Learning From District Efforts to Strengthen Educational Leadership*, a multi-year, mixed-methods study, now in its second year. The study aims to extend present understandings about how successful leadership at the state, district, and school levels improves student learning. The project is one of the largest studies of

educational leadership ever undertaken. Its scale offers the potential for more robust evidence of leadership effects than have been available to date. Results should be of considerable interest to policy makers, leadership developers, school reformers, and leadership practitioners. Over the 5-year period of the study, two rounds of quantitative and qualitative data are being collected. Survey data are being provided by those in many different state, district, school, and other roles in a total of 180 schools, 45 districts and 9 states. Site visit interviews and classroom observations are being conducted in a subsample of these schools (36) and districts (18) in all 9 states. Approximately 65 state-level informants also are being interviewed by phone during the first 2 years of the project.

2. The samples used in the three articles in this issue using survey data are approximately similar but not identical. This article used data available earlier than the data used for the Wahlstrom and Louis article in this issue, for example.

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