HOW SUPERVISION INFLUENCES TEACHER EFFICACY AND COMMITMENT: AN INVESTIGATION OF A PATH MODEL

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ABSTRACT: Although teacher supervision is a commonly practiced activity in schools, little is currently known about its effect on teachers or the mechanism by which supervision affects instruction. The purpose of this study was to test a model that describes how supervision works in schools to influence teacher efficacy and commitment. This hypothesized model was based on Tschannen-Moran, Hoy, and Hoy's original conceptions about how teacher efficacy is developed and nurtured but was modified to include variables associated with supervision and organizational agency. The model was then tested through structural equation modeling. Results indicated the data fit the conceptual model quite well. A second independent data set was employed as a replication sample and confirmed the linkages proposed in the original model. Results indicated supervision has a profound impact on teachers' commitment and efficacy levels, but the paths that influence these variables are complex and indirect. Teachers' belief in the importance principals attached to the teachers' instructional activities seemed to be of great value in predicting teacher efficacy and, indirectly, teacher commitment. Teachers' satisfaction and trust in their peers also played an important and independent role in the development of teachers' commitment to teaching and their efficacy beliefs.

Although formative teacher evaluation, often called supervision, is a common feature of life in schools, very little is known about its direct or indirect effect on teachers or the mechanism by which teacher supervision influences classroom instruction. Authors over the last 40 years have lamented the lack of definitive studies on supervision.[1] Most of the extant reports that could be classified

[1]A. Denham, "Clinical Supervision: What We Need to Know About Its Potential for Improving Instruction," *Contemporary Education* 49 (Fall 1977): 33–37. Denham reported he could locate no studies in *Review of Educational Research* that focused on supervision, improvement of instruction, or efforts of any kind to improve instruction. As of December 2000, there were seven articles related to teacher evaluation or supervision; however, only Darling-Hammond's focused review of the design and implementation of teacher evaluation processes in school organizations (*Review of Educational Research* 53 [Fall 1983]: 285–328) is of use in constructing a

as research-based are descriptive, are correlational, or compare group means. Few of these studies are guided by explanatory models or employ analytical techniques designed to uncover such models.[2] Indeed, some noted authors in the field have questioned the value of doing research in this area, given the lack of a conceptual grounding in the existing literature.[3]

In summarizing research on supervision in the *Journal of Curriculum and Supervision*, Alfonso concluded that the "lack of research and continuing disagreement on the definition and the purposes of supervision in education have . . . contributed to weak preparation programs for instructional supervisors."[4] Indeed, as Davis points out, what little research-based information is available is not used in evaluation practices by most school districts.[5] Thus, we have a widely employed administrative practice based on a weak conceptual grounding that is supported by few empirical studies and lacks an overall model that might serve to guide future research.

The general lack of a conceptual foundation for much of the past research on supervision, although disappointing, has led some investigators to search for possible models in other areas that could help explain or provide insight about how the supervision process in schools might affect selected outcomes. One field of research that seems potentially useful and already has existing explanatory mod-

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larger picture of the effects of principal supervision on teachers. Between 1982 and 2000, only 5 percent of the articles in the major, widely circulated journals, which often focus on supervision (*Educational Leadership*, the official publication of the Association for Supervision and Curriculum Development; the *Journal of Curriculum and Supervision*, ASCD's research outlet; *Educational Evaluation and Policy Analysis*; and *Review of Educational Research*), dealt with teacher supervision. Fewer than 2 percent of those articles were categorized by the ERIC document collection system as research based. The *Journal of Personnel Evaluation in Education* is the only journal exclusively devoted to personnel evaluation in education. Since it began publication in 1987, *JPEE* has published 94 articles that reported new knowledge resulting from quantitative and qualitative studies on a personnel evaluation topic (35 percent of the total number of articles published in the journal), yet only 20 of those articles concentrated on formative teacher supervision.

[2]D. Davis, "History and Summary Analysis of Articles Published in the *Journal of Personnel Evaluation in Education:* Documenting the First Twelve Years," *Journal of Personnel Evaluation in Education* 13 (Fall 1999): 5–26.

[3]P. Holland and N. Garman, "Toward a Resolution of the Crisis of Legitimacy in the Field of Supervision," *Journal of Curriculum and Supervision* 16 (Winter 2001): 95–111.

[4]R. Alfonso, "Supervision: Needed Research: A Research Agenda," *Journal of Curriculum and Supervision* 5 (Winter 1990): 181–188.

[5]D. Davis, "History and Summary Analysis of Articles Published in the *Journal of Personnel Evaluation in Education:* Documenting the First Twelve Years," *Journal of Personnel Evaluation in Education* 13 (Fall 1999): 5–26.

els is teacher efficacy. The literature in this field has generally been based on Bandura's social cognitive theory, a unified theory of behavioral change concerned with human agency, or the ways that people exercise some level of control over their lives.[6] Central to the exercise of control is a sense of self-efficacy, or a belief in one's capacity to achieve success in a given situation.

Interest in examining teacher efficacy as an outcome variable influenced by supervision is justified given the powerful influence teacher efficacy seems to have on classroom practice and subsequent student achievement.[7] In addition, empirical research completed by Ebmeier and Nicklaus[8] has also demonstrated that a specific form of supervision termed developmental supervision can produce enhanced levels of teacher efficacy and presumably academic achievement.[9] The mechanism by which this effect is produced is, however, unknown.

Although evidence suggests a causal link between active teacher supervision and increased levels of individual teacher efficacy, Ebmeier and Nicklaus report that if peer teachers are assigned the supervision responsibility (instead of the building principal) the effect sizes go down markedly.[10] Clearly this indicates other intervening

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[6]See A. Bandura, "Self-efficacy: Toward a Unifying Theory of Behavioral Change," *Psychological Review* 84 (March 1977): 191–215; A. Bandura, *Social Foundations of Thought and Action: A Social Cognitive Theory* (Englewood Cliffs, NJ: Prentice-Hall, 1986); A. Bandura, *Self-efficacy: The Exercise of Control* (New York: W. H. Freeman, 1997).

[7]See R. Allinder, "The Relationship Between Efficacy and the Instructional Practices of Special Education Teachers and Consultants," *Teacher Education and Special Education* 17 (Spring 1994): 86–95; P. Ashton and R.Webb, *Making a Difference: Teachers' Sense of Efficacy and Student Achievement* (New York: Longman, 1986); S. Gibson and M. Dembo, "Teacher Efficacy: A Construct Validation," *Journal of Educational Psychology* 76 (August 1984): 569–582; C. Meijer and S. Foster, "The Effect of Teacher Self-efficacy on Referral Chance," *Journal of Special Education* 22 (Fall 1988): 378–385; A. Woolfolk and W. Hoy, "Prospective Teachers' Sense of Efficacy and Beliefs About Control," *Journal of Educational Psychology* 82 (Fall 1990): 81–91; M. Tschannen-Moran, A. Hoy, and W. Hoy, "Teacher Efficacy: Its Meaning and Measure," *Review of Educational Research* 68 (Summer 1998): 202–248; and R. Goddard, W. Hoy, and A. Hoy, "Collective Teacher Efficacy: Its Meaning, Measure, and Impact on Student Achievement," *American Educational Research Journal* 37 (Summer 2000): 479–507.

[8]H. Ebmeier and J. Nicklaus, "The Impact of Peer and Principal Collaborative Supervision on Teachers' Trust, Commitment, Desire for Collaboration, and Efficacy," *Journal of Curriculum and Supervision* 14 (Summer 1999): 351–378.

[9]C. Glickman, S. Gordon, and J. Ross-Gordon, *Supervision and Instructional Leadership: A Developmental Approach* (Boston: Allyn & Bacon, 2001).

[10]H. Ebmeier and J. Nicklaus, "The Impact of Peer and Principal Collaborative Supervision on Teachers' Trust, Commitment, Desire for Collaboration, and Efficacy," *Journal of Curriculum and Supervision* 14 (Summer 1999): 351–378.

variables are at work. Indeed, social cognitive theory associated with the efficacy research acknowledges that individual teacher efficacy operates within a broad network of sociostructural influences.[11] Apparently, to understand how teacher efficacy develops and is sustained, one must examine school contextual variables as well. Thus, the analysis of how teacher supervision influences teacher efficacy must also include variables that represent organizational influences if a more complete picture is to be obtained.

The purpose of this study was to investigate possible linkages among teacher efficacy, teacher commitment, teacher supervision, and a defined set of organizational variables (confidence in the principal, commitment to the building's goals, satisfaction with working conditions, confidence in peers). The goal of this investigation was to begin to understand, through path analytic modeling, how principal supervision of teachers influences individual teacher efficacy and commitment, and what organizational influences play a collateral role in this process.

THE GUIDING CONCEPTUAL MODEL

For research that involves path modeling, the study must have a sound conceptual grounding. Indeed, path analytic techniques assume there is some theoretical understanding about the ordering of the variables. These prior assumptions then allow one to draw tentative conclusions about the soundness of the proposed model. If the collected data fit the proposed theoretical model, then the model itself gains credibility.

Because we lack well-developed models to use in research on teacher supervision, a model proposed by Tschannen-Moran, Hoy, and Hoy to explain how teacher efficacy is developed and sustained was adopted as an initial frame of reference in this study.[12] The original model was then extended to include variables measuring support of teaching through active supervision and variables measuring school organizational influences. In addition, a dimension measuring Commitment to Teaching (an outcome variable implied by the Tschannen-Moran, Hoy, and Hoy model) was included to add robustness.

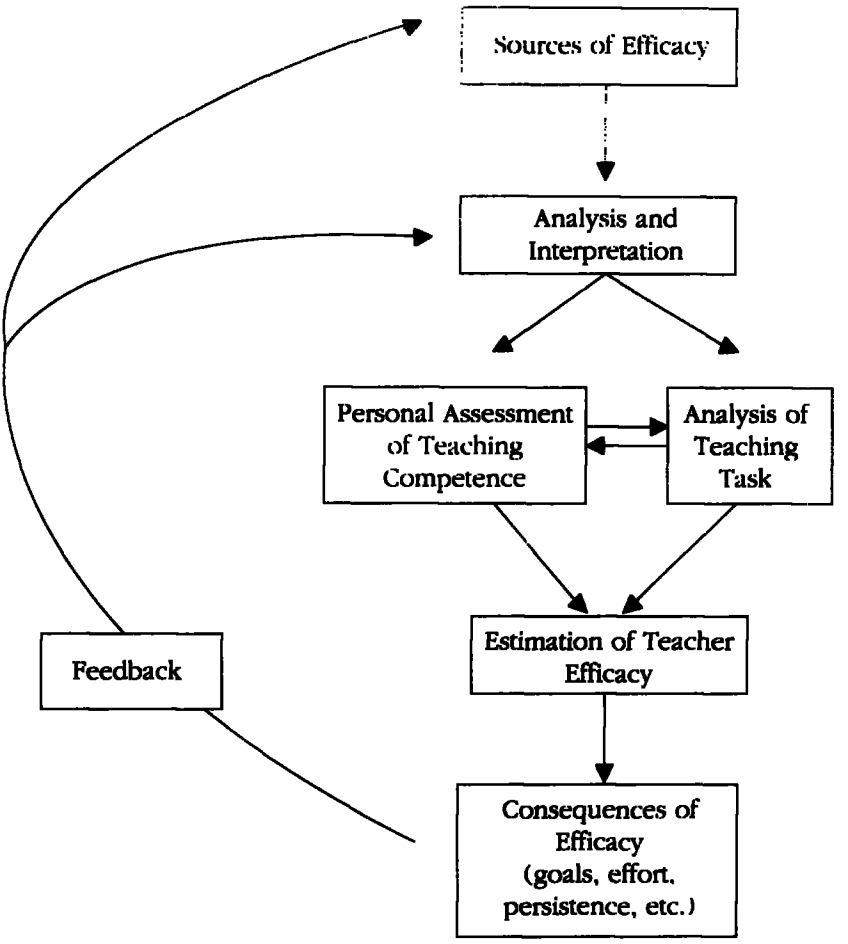
The Basic Underlying Model

Tschannen-Moran, Hoy, and Hoy's model (see Figure 1) begins by assuming the major influences on teacher efficacy beliefs are ini-

[11]A. Bandura, *Self-efficacy: The Exercise of Control* (New York: W. H. Freeman, 1997), p. 6.

[12]M. Tschannen-Moran, A. Hoy, and W. Hoy, "Teacher Efficacy: Its Meaning and Measure," *Review of Educational Research* 68 (Summer 1998): 202–248.

Figure 1. Tschannen-Moran, Hoy, and Hoy Model of Teacher Efficacy



tially based on the attributional interpretation of four sources of information originally suggested by Bandura:

- Mastery experiences—the extent to which a teacher has the opportunity to experience success in a given endeavor. Successful experiences raise efficacy beliefs, which contributes to the expectation that performance will be proficient in the future.
- Physiological arousal—the extent to which performances can be attributed to internal or controllable causes, not simply luck. The level of arousal, either of anxiety or excitement, also plays an important role.

- Vicarious experiences—the extent to which a teacher has learned by observing the performances or skills of others and can identify with the performer.
- Verbal persuasion—the extent to which the teacher has received specific performance feedback from a supervisor or colleague. Receiving encouragement to the extent that it boosts risk-taking performances increases efficacy.

According to this model, efficacy beliefs are also tempered by context. Teachers may feel efficacious in one situation but not in another. Indeed, this belief in self-efficacy may vary across subject area, grade levels, or even different activity structures within the same classroom. Therefore, according to the Tschannen-Moran, Hoy, and Hoy model, when teachers make efficacy judgments, they consider the difficulty of the situation (labeled Analysis of Teaching Task in their model) and weigh that against their perceived beliefs of their own competencies as teachers (Personal Assessment of Teaching Competence). If they believe they have the personal teaching strengths necessary to overcome the perceived environmental difficulties (poor student ability, lack of parent support, inadequate equipment, and so forth), then strong efficacy beliefs emerge (labeled Estimation of Teacher Efficacy).

In the Tschannen-Moran, Hoy, and Hoy model, these final efficacy beliefs strongly influence actual teacher behavior (goal selection, instructional effort, persistence, and so forth), which affects student achievement. Tschannen-Moran, Hoy, and Hoy suggest that these teacher behaviors, which they term Consequences of Efficacy, in turn provide performance feedback to the original sources of efficacy (mastery experiences, physiological arousal, vicarious experiences, and verbal persuasion), thus completing the cycle.

Figure 2 displays the conceptual model that guided this study. The model includes both the task analysis (labeled External Influences) and the components related to personal assessment of teaching competence (labeled Personal Efficacy) suggested by the original model. The variable found in the original study labeled Consequences of Efficacy was measured by Commitment to Teaching.

One modification of the original model was made out of necessity. Tschannen-Moran, Hoy, and Hoy hypothesized that after teachers examine the task and their own skills, they make a final estimate of their own efficacy in the particular situation. Unfortunately, no existing instruments capture this final teacher efficacy estimate. When these final efficacy estimates are needed, researchers tend to add together the scales that measure task and personal efficacy. Constructing a new scale that is a combination of other scales raises

Figure 2. A Conceptual Model of the Relationships Among Efficacy, Organizational Agency, and Supervision

important measurement and conceptual problems in structural equation modeling. To overcome these problems, the conceptual model tested in this study deleted the Final Estimation of Teacher Efficacy dimension found in the original Tschannen-Moran, Hoy, and Hoy model.[13] Instead, the model proposed in this study assumed teacher behavior was influenced jointly by the External Influences and Personal Efficacy factors without going through the intermediate step (Estimate of Teacher Efficacy) proposed by the original model.

The basic elements of the Tschannen-Moran, Hoy, and Hoy model (Analysis of Teaching Task Constraints, Assessment of Individual Teacher Competence, and Consequences of Efficacy Beliefs) appear in the lower-left side of the overall model proposed in this study (Figure 2).

Extensions of the Basic Model

Although no other modifications were made to the original Tschannen-Moran, Hoy, and Hoy model, two extensions were incorporated into the model tested in this study. First, the original model suggested that teacher efficacy is influenced by prior mastery experiences, vicarious experiences, social persuasion, and emotional states. Given recent research linking principal behaviors to teacher efficacy, it seems obvious that one important source of these four efficacy-building factors is the principal.[14] One aspect of principal leadership that is likely to influence teacher efficacy is active teacher supervision. Clearly, principal support of teaching through supervision activities can provide feedback, encouragement, emotional support, reinforcement, and modeling experiences, which are suggested as sources of efficacy in the original Tschannen-Moran, Hoy, and Hoy model. Indeed, Chester and Beaudin reported that if new teachers were given greater opportunity for collaboration with other adults

[13]Clearly, a better test of the original Tschannen-Moran, Hoy, and Hoy model would be to include measures of all three efficacy-related concepts (teacher's estimate of the task, teacher's estimate of his or her own ability, and final efficacy estimates considering the prior two factors). To better test the original model, one would need to clearly specify the context, students, and subject field to obtain a measure of an individual teacher's estimation of his or her overall efficacy after consideration of the needed task and the teacher's personal skills. This study's ability to strictly test the proposed Tschannen-Moran, Hoy, and Hoy model was compromised by the lack of inclusion of the overall estimate of the efficaciousness of the situation and the necessary model rearrangement.

[14]W. Hoy and A. Woolfolk, "Teachers' Sense of Efficacy and the Organizational Health of Schools," *Elementary School Journal* 93 (March 1993): 355–372; H. Ebmeier and J. Nicklaus, "The Impact of Peer and Principal Collaborative Supervision on Teachers' Trust, Commitment, Desire for Collaboration, and Efficacy," *Journal of Curriculum and Supervision* 14 (Summer 1999): 351–378.

and if more classroom observations were conducted (characteristics of sound supervision), greater teacher efficacy resulted.[15]

To capture this source of potential efficacy due to interactions with the principal, two additions to the original model were included. The first is termed Active Principal Supervision; it measured the extent to which the principal engaged in activities normally associated with supervision (classroom observations, feedback to the teacher, goal setting, and so forth). If supervision is to influence teacher efficacy, the principal must take an active role. This variable measured the extent to which these activities occurred. The second addition was called Principal Support of Teaching, which captured the teacher's belief that the principal took an active interest in the teacher's improvement efforts. These additions to the original model appear in the left half of Figure 2.

Another extension of the basic model suggested by Tschannen-Moran, Hoy, and Hoy adds a cluster of variables often associated with organizational agency, or the influence of the organization on individual behavior (Confidence in the Principal, Commitment to the Building, Satisfaction with Working Conditions, and Confidence in Peers). Although they never incorporated organizational agency into the formal model, Tschannen-Moran, Hoy, and Hoy originally suggested that teacher efficacy is influenced by organizational agency through reciprocal relationships between the school context and teacher efficacy beliefs. Teachers' sense of efficacy is thus related to a number of school-level variables such as climate, decision-making structures within the school, general school support systems, a sense of community within the staff, and several other factors.[16]

Just as a principal's support of teaching can be a source of prior mastery experiences, vicarious experiences, social persuasion, and emotional states, so too can the interactions and belief systems resident in the building's staff and culture. The original Tschannen-Moran, Hoy, and Hoy model stipulates the importance of organizational influences in the development of individual teacher efficacy but never identifies the source(s). The extension described here partially attributes individual teacher efficacy development and maintenance to factors associated with organizational agency.

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[15]M. Chester and B. Beaudin, "Efficacy Beliefs of Newly Hired Teachers in Urban Schools," *American Educational Research Journal* 33 (Spring 1986): 233–257.

[16]W. Hoy and A. Woolfolk, "Teachers' Sense of Efficacy and the Organizational Health of Schools," *Elementary School Journal* 93 (March 1993): 355–372; M. Tschannen-Moran, A. Hoy, and W. Hoy, "Teacher Efficacy: Its Meaning and Measure," *Review of Educational Research* 68 (Summer 1998): 202–248.

Although it is clear from prior research that teacher efficacy is influenced by organizational variables, it is less obvious which variables are the most important and how they interact with one another. To make decisions about which variables to include in the tested model, the original sources of efficacy were reexamined. Decisions were then made about which organizational variables might best help facilitate the development of a teacher's efficacy. From review of the four sources of efficacy, it is clear that these sources all operate through either the principal or teacher colleagues. Thus, two important organizational agency variables to include are Confidence in Peers and Confidence in the Principal. The variable Confidence in the Principal was then linked back to Principal Support of Teaching using the same logic as presented in the Tarter, Sabo, and Hoy study, which examined the relationship among supportive principal behavior, faculty collegiality, faculty trust, and effectiveness.[17]

Confidence in Peers was conceived as being correlated to Confidence in the Principal, but a source of efficacy-building activities separate from those connected to Active Principal Supervision. Strong support for inclusion of this variable comes from the writings of Bandura and Goddard, Hoy, and Hoy, who have described the importance of collective efficacy, which they define as a collective belief of the teaching staff about the organization's capabilities to innovate and attain its goals.[18]

Two other organizational agency variables were added. First, Satisfaction with Working Conditions was included and conceived as an outcome of Confidence in the Principal and Confidence in Peers. Measures of teacher satisfaction have long been associated with teacher professional commitment and are important predictors of career withdrawal.[19] Second, a variable termed Commitment to the Building was included as a measure of organizational commitment and viewed as an outcome of Confidence in the Principal and Confidence in Peers. It was also viewed, as can be observed from Figure 2, as a predictor of the extent to which teachers viewed ex-

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[17]C. Tarter, D. Sabo, and W. Hoy, "Middle School Climate, Faculty Trust, and Effectiveness: A Path Analysis," *Journal of Research and Development in Education* 29 (Fall 1995): 41–49.

[18]A. Bandura, *Self-efficacy: The Exercise of Control* (New York: W. H. Freeman, 1997); R. Goddard, W. Hoy, and A. Hoy, "Collective Teacher Efficacy: Its Meaning, Measure, and Impact on Student Achievement," *American Educational Research Journal* 37 (Summer 2000): 479–507.

[19]P. Lam, Y. Foong, and S. Moo, "Work Life, Career Commitment, and Job Satisfaction as Antecedents of Career Withdrawal Cognition Among Teacher Interns," *Journal of Research and Development in Education* 28 (Summer 1995): 230–235.

ternal constraints as impediments to effectiveness (Estimated External Influences).

Addition to the Basic Model

The primary intent of this article was to investigate the relationships between active principal supervision and individual teacher efficacy. However, extant research also suggests important connections among teacher efficacy, teacher commitment, and principal supervision.[20] For example, teacher efficacy has been linked to level of professional commitment for both inservice elementary and middle school teachers and preservice teachers.[21] In addition, extensive work has investigated the linkages among various measures of organizational agency (work satisfaction, morale, trust, and so forth) and teacher commitment. Thus, a dimension called Commitment to Teaching was added to the model to make the tested model more inclusive and potentially more robust in terms of explaining how supervision affects teachers.

This addition is consistent with the basic Tschannen-Moran, Hoy, and Hoy model, which suggests that a teacher's concept of efficacy influences his or her goal selection, effort, persistence, and other actions. Commitment to Teaching, the outcome variable added to the model, is simply one of many alternative measures of what Tschannen-Moran, Hoy, and Hoy term the Consequences of Teacher Efficacy in their original model.

THE OPERATIONAL MODEL

Figure 2 presents the hypothesized model used as the starting point for investigating the interactive relationships among the variables in this study. Support for inclusion of variables in this operational model and the hypothesized paths comes primarily from the Tschannen-Moran, Hoy, and Hoy model but also from three additional sources. First, the large literature base from organizational the-

[20]K. Seashore-Lewis, "Effects of Teacher Quality Work Life in Secondary Schools on Commitment and Sense of Efficacy," *School Effectiveness and School Improvement* 9 (March 1998): 1–27; P. Reyes, "Preliminary Models of Teacher Organizational Commitment: Implications for Restructuring the Workplace," ED 349680 (Madison, WI: Center on Organization and Restructuring of Schools, 1992).

[21]T. Coladarci, "Teachers' Sense of Efficacy and Commitment to Teaching," *Journal of Experimental Education* 60 (Summer 1992): 323–337; E. Evans and M. Tribble, "Perceived Teaching Problems, Self-efficacy, and Commitment to Teaching Among Preservice Teachers," *Journal of Educational Research* 80 (December 1986): 81–85.

ory has investigated similar constructs for many years.[22] Although this research primarily uses simple correlational analytic techniques, these studies are helpful in identifying possible variables and paths to include in any potential model useful for understanding how supervision works in schools.

The second literature base is much smaller and includes experimental studies about various aspects of the supervision process and its effects.[23] These research studies move beyond the correlational stage with manipulation of the independent variable and confirmation of a causal linkage between principal supervision and a number of other variables. They are, however, still "black box" in nature; therefore they offer little guidance concerning the mechanism by which supervision actually influences these outcome variables.

The third set of studies, all undertaken within the last 10 years, uses path analytic techniques to attempt to uncover possible linkages among teacher affective variables (motivation, efficacy, satisfaction, commitment, and so forth) and measures of school effectiveness. Although these studies do not directly focus on the supervision process, many of the variables and paths identified in these studies parallel those included in the tested model.[24]

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[22]For comprehensive reviews of this literature, see H. Ebmeier and A. Hart, "The Effects of a Career-ladder Program on School Organizational Processes," *Educational Evaluation and Policy Analysis* 14 (Fall 1992): 261–282; P. Reyes, *Teachers and Their Workplace: Commitment, Performance, and Productivity* (Newbury Park, CA: Sage Publications/Corwin Press, 1990); N. Pitner, "The Study of Administrator Effects and Effectiveness," *Handbook of Research in Educational Administration,* ed. N. Boyan (New York: Longman, 1988); P. Hallinger and R. Heck, "Reassessing the Principal's Role in School Effectiveness: A Review of Empirical Research, 1980–1995," *Educational Administration Quarterly* 3 (Fall 1996): 5–44; E. Bridges, "Research on the School Administrator: The State of the Art, 1967–1980," *Educational Administration Quarterly* 18 (Summer 1982): 12–33.

[23]See C. Seins and H. Ebmeier, "The Impact of Developmental Supervision on Teacher Reflective Thinking: An Empirical Study," *Journal of Curriculum and Supervision* 11 (Summer 1996): 299–319; H. Ebmeier and J. Nicklaus, "The Impact of Peer and Principal Collaborative Supervision on Teachers' Trust, Commitment, Desire for Collaboration, and Efficacy," *Journal of Curriculum and Supervision* 14 (Summer 1999): 351–378.

[24]For specific examples, see P. Hallinger and R. Heck, "Reassessing the Principal's Role in School Effectiveness: A Review of Empirical Research," *Educational Administration Quarterly* 32 (1996): 5–44; R. Heck and G. Marcoulides, "School Culture and Performance: Testing the Invariance of an Organizational Model," *School Effectiveness and School Improvement* 7 (March 1996): 76–95; for reviews of this literature, see A. Chase, "School Level Factors Predicting Teachers' Senses of Professional Engagement, Efficacy, Commitment, and Job Satisfaction: An Application of Structural Equation Modeling," ED347693 (1991): 1–39; and R. Heck, T. Larsen, and G. Marcoulides, "Instructional Leadership and School Achievement: Validation of a Causal Model," *Educational Administration Quarterly* 26 (May 1990): 94–125.

The operational model presented in Figure 2 makes four assumptions based on extant literature. First, principal supervision in the form of actively supporting and encouraging effective instruction leads directly to teacher confidence in the building administration and to personal efficacy, and indirectly to commitment to teaching.[25] Second, teacher confidence and trust in peers leads directly to satisfaction with working conditions, commitment to building goals, and commitment to teaching, and indirectly to a greater sense of personal and external efficacy.[26] Third, confidence in teaching peers engenders a commitment to building goals and leads indirectly to a belief by teachers that they can overcome external obstacles such as poor student attendance. This results in a greater sense of a teacher's own sense of personal efficacy.[27] Finally, a strong sense of personal

[25]For examples of supporting literature, see M. McBride and K. Skau, "Trust, Empowerment, and Reflection: Essentials of Supervision," *Journal of Curriculum and Supervision* 10 (Spring 1995): 262–277; B. Billingsley, L. Cross, and P. Littrel, "The Effects of Principal Support on Special and General Educators' Stress, Job Satisfaction, School Commitment, Health, and Intent to Stay in Teaching," *Remedial and Special Education* 15 (September 1994): 297–310; W. Firestone and B. Wilson, "Using Bureaucratic and Cultural Linkages to Improve Instruction: The Principal's Contribution," *Educational Administration Quarterly* 21 (Spring 1985): 7–30; S. Bossert, D. Dwyer, B. Rowan, and G. Lee, "The Instructional Management Role of the Principal," *Educational Administration Quarterly* 18 (Spring 1982): 34–63; K. Peterson and J. Martin, "Developing Teacher Commitment: The Role of the Administrator," in *Teachers and Their Workplace: Commitment, Performance, and Productivity*, ed. P. Reyes (Newbury Park: Sage Publications, 1990), pp. 225–240; W. Hoy, C. Tarter, and L. Witkoskie, "Faculty Trust in Colleagues: Linking the Principal with School Effectiveness," *Journal of Research and Development in Education* 26 (Fall 1992): 38–45; C. Anderson, "The Search for School Climate: A Review of the Research," *Review of Educational Research* 52 (Fall 1982): 368–420.

[26]B. Fresko, D. Kfir, and F. Nasser, "Predicting Teacher Commitment," *Teaching and Teacher Education* 13 (May 1997): 429–438; K. Hipp, "Teacher Efficacy: Influence of Principal Leadership Behavior" (paper presented at the annual meeting of the American Educational Research Association, New York, 1996); C. Riehl and J. Sipple, "Making the Most of Time and Talent: Secondary School Organizational Climates, Teaching Task Environments, and Teacher Commitment," *American Educational Research Journal* 33 (Winter 1996): 873–901; M. Pennington, "Work Satisfaction, Motivation, and Commitment in Teaching English as a Second Language," ED404850 (1995); C. Tarter, D. Sabo, and W. Hoy, "Middle School Climate, Faculty Trust, and Effectiveness: A Path Analysis," *Journal of Research and Development in Education* 29 (Fall 1995): 41–49; R. Clay, H. Heller, and C. Perkins, "The Relationship Between Teacher Job Satisfaction and Principal Leadership Style," *Journal of School Leadership* 3 (January 1993): 74–86; C. Tarter, J. Bliss, and W. Hoy, "School Characteristics and Faculty Trust in Secondary Schools," *Educational Administration Quarterly* 25 (August 1989): 294–308.

[27]P. Reyes, "Preliminary Models of Teacher Organizational Commitment: Implications for Restructuring the Workplace," ED349680 (Madison, WI: Center on Organization and Restructuring of Schools, 1992); E. Anderman, S. Belzer, and

efficacy coupled with commitment to building goals, trust and confidence in peers, and satisfaction with working conditions results in a greater commitment to teaching.[28]

METHOD

Sample

Participants in the study were full-time, K–12 teachers in a large Midwestern metropolitan area. Two separate samples were collected for the analysis; one sample served as the basis for construction of the structural equation model (calibration data set), and the other data set was used to validate the initially developed model (validation data set). Data for calibration and validation samples were derived from surveys of teachers conducted between 1993 and 1998. Students in an educational administration master's degree program at a large Midwestern state university identified participating teachers; thus, the sample could best be characterized as one of convenience. Participants were asked to complete a short, 50-item questionnaire and return it to the graduate students for collection in their classes. A 95 percent final response rate was obtained after deleting cases with more than 5 percent missing data. Mean values for each question were then substituted for remaining missing values in the data set. A less than 1 percent substitution rate occurred for the entire data set.

Table 1 describes the background characteristics of the teacher participants. For comparative purposes, summary statistics collected from a large (N = 4,500) and representative sample of teachers in the Midwest are also included in the table. As indicated by comparing the two data sets in Table 1, the sample of teachers is reasonably reflective of the general teaching population except that the sample

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J. Smith, "Teacher Commitment and Job Satisfaction: The Role of School Culture and Principal Leadership" (paper presented at the annual meeting of the American Educational Research Association, Chicago, 1991); M. Smylie, "Teacher Efficacy at Work," in *Teachers and Their Workplace: Commitment, Performance, and Productivity*, ed. P. Reyes (Newbury Park, CA: Sage Publications, 1990).

[28]D. Taylor and A. Tashakkori, "Predicting Teachers' Sense of Efficacy and Job Satisfaction Using Climate and Participatory Decision Making" (paper presented at the annual meeting of the Southwest Educational Research Association, San Antonio, 1994); T. Coladarci, "Teachers' Sense of Efficacy and Commitment to Teaching," *Journal of Experimental Education* 60 (Summer 1992): 323–337; A. Chase, "School Level Factors Predicting Teachers' Senses of Professional Engagement, Efficacy, Commitment, and Job Satisfaction: An Application of Structural Equation Modeling," ED347693 (1991); M. Imber and W. Neidt, "Teacher Participation in School Decision Making," in *Teachers and Their Workplace: Commitment, Performance, and Productivity*, ed. P. Reyes (Newbury Park, CA: Sage Publications, 1990), pp. 67–86.

Table 1. Background Characteristics of Teacher Participants Expressed as Percent of Total (Calibration Sample N = 222, Validation Sample N = 332)

Category and Level	Population[1]	Calibration Sample	Validation Sample
Gender			
Male	30.8	19.8	18.1
Female	69.2	79.3	81.9
Race or Ethnic Group			
Black	1.0	3.2	3.6
Hispanic	0.5	2.3	0.6
Native American	1.6	1.0	0.6
Asian or Pacific	0.2	1.0	0.3
White	96.5	91.9	94.6
Teaching Experience			
1st Year	5.1	8.6	13.9
2–5 Years	11.0	22.5	18.1
6–10 Years	13.2	16.2	16.8
11–15 Years	14.4	11.3	12.6
16–20 Years	30.1	24.8	23.8
21 Years or More	26.2	16.3	14.8
Experience in Current Building			
1st Year	12.6	23.9	22.3
2–5 Years	24.8	29.7	31.6
6–10 Years	19.8	16.2	24.7
11–15 Years	13.8	11.3	12.4
16–20 Years	18.5	9.0	6.3
21 Years or More	10.6	6.3	2.7
Teaching Assignments			
Lower Elementary	22.1	23.0	23.2
Upper Elementary	25.7	18.9	21.4
Middle School	13.0	21.6	27.7
High School	28.0	24.3	22.6
Specials or Special Education	12.8	6.7	5.1
Education			
Bachelor's Degree	12.5	12.6	20.2
Bachelor's Degree Plus	38.5	35.6	32.2
Master's Degree	14.5	16.2	20.5
Master's Degree Plus	33.0	29.3	27.1
Doctorate	1.4	0.9	0.0

[1]Statistics are derived from survey data collected from 200 school districts in Missouri and Kansas and are representative of teachers in the Midwest from which the sample was drawn.

Note: Percentages may not total 100 because of rounding or non-responses.

included slightly more elementary teachers. The calibration sample consisted of data collected between 1997 and 1998, whereas the validation sample was collected between 1993 and 1996. Identical surveys and collection processes were employed across both samples.

Instrumentation

One instrument with multiple sections was administered to both sample groups (calibration and validation) of teachers. Each question on the instrument was assigned to one of the scales described below and in Table 2. Although reliability estimates were available for each scale from previous research, to ensure that the scales were reliable and valid employing the data collected in this study, explanatory factor analysis using the calibration data set was undertaken, followed by the calculation of reliability estimates. Results from these analyses revealed good support for each of the nine scales. Cross loadings were rare, and the nine scales accounted for 76 percent of the overall variance. Cronbach reliability estimates for each of the nine scales were acceptable, ranging from a high of 0.93 for the Active Principal Supervision Scale to a low of 0.71 for the Satisfaction with Working Conditions Scale. This analysis was followed by confirmative factor analysis (described in the next section) to estimate the overlap and duplication among the nine scales. Conceptual definition and Cronbach reliabilities derived from the data collected in this study are presented in Table 2. The derivation and description of each scale follows.

Commitment and Trust Scales. The questions for the two commitment scales (Commitment to Building Goals and Commitment to Teaching) and the two trust scales (Confidence in Peers and Confidence in the Principal) were derived from the *Diagnostic Assessment of School and Principal Effectiveness* instrument.[29] This instrument has been used by more than 500 schools and has excellent validity and reliability estimates. Because this study focused specifically on the supervision process, appropriate questions from the original instrument were extracted and reformatted into four new scales. Orthogonal factor analysis was then undertaken to help establish the mathematical cohesiveness of each of the scales. Results from the analysis of data collected from prior research revealed good support for each of the four scales. Cross loadings were rare, and the four scales accounted for 54.4 percent of the overall variance. Cronbach reliability estimates for each of the four scales were acceptable, ranging from a high of 0.91 for the Confidence in the Principal scale to

[29]H. Ebmeier, *Diagnostic Assessment of School and Principal Effectiveness* (Topeka, KS: United School Administrators, 1990).

Table 2. Questions Supporting Each Scale

Principal Support of Teaching—The teacher's belief that his or her principal was supportive of his or her attempts to become a better teacher and was willing to take an active part in this improvement process. (Reliability 0.90)

My principal is very supportive of my attempts to become a better teacher
My principal is very helpful to me as I attempt to improve the instruction in my classroom.
My principal sincerely cares about helping me improve my teaching techniques.
I have a great deal of trust in my principal and believe he/she really cares about my continued improvement as a professional.

Confidence in the Principal—The teacher's trust in the competence, communication skills, and overall satisfaction with his or her principal. (Reliability 0.91)

I have confidence in the building administrators.
I am satisfied with the trust I have in this building's administrator(s).
I am satisfied with the professional competence and leadership of my building administrator(s).
There are open lines of communications between faculty and the building administration.
Decisions in this building are predictable and fair.

Confidence in Peers—The teacher's confidence in and satisfaction with his or her teaching peers. (Reliability 0.81)

I have a general feeling of confidence in other faculty members.
I am satisfied with the trust I have in this building's teachers.
I am satisfied with the professional competence and teaching ability of my teaching colleagues.

Commitment to Teaching—The teacher's commitment to the profession of teaching. (Reliability 0.85)

I am proud to be a teacher.
Teaching is an excellent profession.
I tend to identify with teaching and strongly support it when it is attacked.
I would leave teaching for another profession if I could.
I tell my friends that I will stay in teaching for many years to come.
If offered a better salary, I would move to another profession.
This job gives me professional satisfaction.
I enjoy my school work very much.

Commitment to Building Goals—The teacher's belief in the goals and values of the school in which they work. (Reliability 0.77)

I believe in the goals and objectives of this school.
I am not satisfied with the goals and objectives emphasized by this school.
The values of this school are inconsistent with my own values.
Unlike this school, I would like to work in a school that holds the same values as I do.

Active Principal Supervision—The extent to which the principal actively participated in a clinical supervision process through observations, data collection, feedback, goal setting, and improvement strategies. (Reliability 0.93)

Table 2. Questions Supporting Each Scale *(continued)*

As part of the supervision/evaluation cycle, my principal often helps collect data which I find useful to help me improve my own instruction.
During a supervision/evaluation conference, my principal is very useful in helping me set goals on which I can work.
As a result of my principal's questioning during supervision/evaluation conferences, I have been stimulated to analyze my own teaching.
During the supervision/evaluation conferences, my principal asks probing questions that really make me think.
My principal and I often discuss the instructional strategies I use in my classroom.
I often look to my principal as a person who can individually help me improve the instruction in my class.
My principal offers specific improvement suggestions during supervision/evaluation conferences.
My principal encourages me to use more than one instructional strategy when I teach.
My principal frequently observes my classroom.
When my principal observes my classroom, he/she looks for specific things upon which we agreed.

Satisfaction with Working Conditions—The teacher's view of the quality of the working conditions at his or her school, including balanced workloads, staff friendliness, social activities, communication across teachers and students. (Reliability 0.71)

Working conditions in this school are good.
The workload is adequately balanced among the faculty members of this school.
I am satisfied with the amount of work I am expected to do.
There are sufficient social activities for the faculty.
The social contact between students and faculty is friendly.
Faculty members are friendly to one another.

Personal Efficacy—The teacher's belief that he or she can make a difference in student learning. (Reliability 0.71)

If a student masters a new concept quickly, this might be because I knew the necessary steps in teaching that concept.
When the grades of my students improve, it is usually because I found more effective teaching approaches.
When I really try, I can get through to most difficult students.
If a student did not remember information I gave in a previous lesson, I would know how to increase his/her retention in the next session.
When a student does better than usual, many times it is because I exerted a little extra effort.
If a student in my class becomes disruptive and noisy, I feel assured that I know some techniques to redirect him/her quickly.
If one of my students could not do a class assignment, I would be able to accurately assess whether the assignment was at the correct level of difficulty.
When a student is having difficulty with an assignment, I am usually able to adjust it to his/her level.

(Table continues on next page)

Table 2. Questions Supporting Each Scale *(continued)*

When a student gets a better grade than he/she usually gets, it is usually because I found better ways of teaching that student.
Even a teacher with good teaching abilities may not reach many students.

External Influences—The teacher's belief that external factors such as family background, intelligence, and home environment are more important than what transpires in the classroom. (Reliability 0.78)

If students are not disciplined at home, they aren't likely to accept my discipline.
A teacher is very limited in what he/she can achieve because a student's home environment is a large influence on his/her achievement.
The hours in my class have little influence on students compared to the influence of their home environment.
The amount that a student can learn is primarily related to family background.
If parents would do more with their children, I could do more.
The influence of a student's home environment can be overcome by good teaching.

a low of 0.77 for the Commitment to Building Goals scale. Representative questions and operational definitions appear in Table 2.

Personal Efficacy and External Influences Scales. Bandura's social cognitive theory suggests behavior is affected by both task expectations (the judgments an individual makes about the likely consequences of specific behavior in a particular situation) and efficacy expectations (an individual's belief about his or her own capabilities to achieve a certain end). Building on Bandura's reasoning and the subsequent work of Ashton and Webb, Gibson and Dembo developed a questionnaire designed for inservice teachers that measured these two dimensions of efficacy.[30] Their original Teacher Efficacy Scale included 30 statements on a 6-point Likert scale ranging from "strongly agree" to "strongly disagree." Factor analysis by Gibson and Dembo and later Woolfolk and Hoy supported the existence of these two factors; however, both studies concluded only 16 of the original 30 items were needed to obtain acceptable reliability coefficients.[31] This study employed the reduced set of 16 questions as measures of efficacy. Ten questions measured the concept of Personal Efficacy expectations, and six questions addressed the Exter-

[30]P. Ashton and R. Webb, *Making a Difference: Teachers' Sense of Efficacy and Student Achievement* (New York: Longman, 1986); S. Gibson and M. Dembo, "Teacher Efficacy: A Construct Validation," *Journal of Educational Psychology* 76 (August 1984): 569–582.

[31]A. Woolfolk and W. Hoy, "Prospective Teachers' Sense of Efficacy and Beliefs About Control," *Journal of Educational Psychology* 82 (March 1990): 81–91.

nal Influences dimension.[32] Separate orthogonal factor analysis on the data obtained in this study supported the existence of two factors, which accounted for 44.3 percent of the overall variance. The Cronbach reliabilities of the two scales have been reported in the 0.70 to 0.90 range, depending on the study. Operational definitions and sample questions appear in Table 2.

Active Principal Supervision Scale. The Active Principal Supervision Scale was included on the questionnaire to assess the degree to which key elements of supervision were employed. The 10 questions on the scale (see Table 2) ask the teacher to what extent certain behaviors or processes that are characteristic of active supervision occurred. The Cronbach reliability estimate for this scale derived from previous data was 0.90. Two separate validity studies were conducted to confirm that the scale accurately measured the extent of the principal's use of active supervision. Both studies administered the scale to a large sample of teachers, followed by personal interviews with a 30 percent sample of the same group. In both cases, the results from the personal interviews of the teachers and the scores from the Active Supervision Scale were highly correlated (>0.70).[33]

Principal Support of Teaching Scale. This scale was created specifically for this study and measured the principal's general support of the teacher as he or she attempted to improve his or her instructional effectiveness. The scale consisted of four questions assessing principal support, helpfulness, and caring about instructional improvement. The overall reliability of the scale using the data collected for this study was 0.90.

Satisfaction with Working Conditions Scale. The six questions on the Satisfaction with Working Conditions Scale were derived from the *Diagnostic Assessment of School and Principal Effectiveness* instrument.[34] These questions measured the extent to which teachers viewed the quality of working conditions in their school as healthy

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[32]The general efficacy literature often refers to these concepts as General and Personal Teaching Effectiveness, although from examination of the questions constituting each scale, it is obvious that the former could better be described as a measure of the extent to which external factors such a family background impinge on teaching.

[33]For additional details, see C. Seins and H. Ebmeier, "Developmental Supervision and the Reflective Thinking of Teachers," *Journal of Curriculum and Supervision* 11 (Summer 1996): 299–319; and B. Armstrong, "A Study to Determine the Teachers' Perception of the Principal's Use of Developmental Supervision and Its Effect on Teachers' Efficacy" (unpublished Ed.D. dissertation, University of Kansas, 1993).

[34]H. Ebmeier, *Diagnostic Assessment of School and Principal Effectiveness* (Topeka, KS: United School Administrators, 1990).

and satisfying. The six questions were selected to measure global satisfaction as opposed to facet scales, which focus on the individual components of job satisfaction (pay, promotion, supervision, benefits, rewards, communication, and so forth). Reliability and validity estimates for this scale are reasonably good and have been reported elsewhere. The general format of the scale and the nature of the questions asked are very similar to the widely accepted instruments in the field.[35]

Data Analysis[36]

Structural equation modeling, based on the EQS program, was used to identify potentially important theoretical relations and to test the plausibility of a postulated causal system comprising the nine latent variables.[37] SEM models have two basic elements. The measurement model delineates the associations between measured and latent variables (i.e., how well the concepts measured on the instrument are reflected in the data). The structural model estimates the direct and indirect effects among latent variables. This study followed a stepwise procedure similar to Anderson and Gerbing's recommendation, in which the acceptability of the measurement of constructs is evaluated first, before proceeding to an evaluation of relations among the nine constructs.[38]

Analyses were conducted in five stages. First, two separate sets of data were collected and served as the calibration and validation samples. Preliminary analysis identified cases having unusual characteristics in each group (total of 9). Deletion of these cases resulted in a calibration sample size of 222 and validation sample size of 332. Second, to reduce the sheer number of individual questions from the original survey, selected items from the original questionnaires were combined to form multiple measurement indicators of each construct. Grouped questions (testlets) measured the same concept and were selected because of similarity and previous factor loadings.

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[35]For a discussion of the characteristics of the most common instruments measuring job satisfaction, see P. Spector, *Job Satisfaction: Application, Assessment, Consequences, and Causes* (Thousand Oaks, CA: Sage Publications, 1997), p. 5.

[36]The analysis for this study follows the suggestions and examples contained in B. Byrne, *Structural Equation Modeling with EQS and EQS/Windows: Basic Concepts, Applications, and Programming* (Thousand Oaks, CA: Sage Publications, 1994).

[37]P. Bentler, *EQS: Structural Equations Program Manual* Version 3.0 (Encino, CA: BMDP Statistical Software, Inc., 1995).

[38]J. Anderson and D. Gerbing, "Structural Equation Modeling in Practice: A Review and Recommended Two-step Approach," *Psychological Bulletin* 103 (May 1988): 411–423.

This resulted in a reduction from 56 to 42 individual indicators of the 9 latent variables. Third, confirmative factor analyses (CFAs) were used to establish and finely tune the measurement model. Fourth, once the measurement model was established, the observed data from the calibration sample were fitted to the hypothesized model and subsequently assessed for goodness-of-fit. Given evidence of inadequate fit, the model was re-specified to include additional causal paths (identified by the Lagrange Multiplier Test) as those that would contribute most to a significantly better fitting model. Once the final best-fitting model was determined, nonsignificant parameters (as identified by the Wald Test) were deleted. Fifth, the final model was cross-validated by testing against the validation sample.

RESULTS

Results of the confirmative factor analysis revealed that the overall measurement model fit exceptionally well (CFI = 0.935, RCFI = 0.953[39]); no additional parameters were specified a posteriori, and the analysis proceeded directly to the second phase—the testing of the structural relationships among the latent variables. Results of model-fitting procedures indicated that the initial hypothesized model (Model 1—Figure 2) yielded a good fit to the data (CFI = 0.911, Robust CFI = 0.921). Nonetheless, a secondary test (LM-Test) indicated that one correlational path, if incorporated into the model, would lead to a slightly better fitting model. Thus, Model 1 was re-

[39]Preliminary analysis indicated multivariate non-normality in the analysis of covariance structures; thus, the robust statistic is also included and probably represents a more accurate CFI value.

Assessment of model fit was based on multiple criteria that reflected statistical, theoretical, and practical considerations; these were (a) the Chi-Squared likelihood ratio statistic, (b) the Robust and normal Comparative Fit Index, (c) the Satorra-Bentler Scaled Statistic, and (d) the substantive meaningfulness of the model. The CFI and its derivative the RCFI (calculated with no assumptions about the shape of the data distribution) are revised versions of the Bentler-Bonett normed fit index that adjusts for degrees of freedom. Each one ranges from zero to one and is derived from the comparison of a restricted model (i.e., one in which structure is imposed on the data) with a null model (one in which each observed variable represents a factor). The CFI provides a measure of complete covariation in the data, with a value greater than 0.90 indicating a good fit of the model to the actual data. The SB incorporates a scaling correction for the Chi-Squared statistics when distributional assumptions are violated. Its computation takes into account the model, the estimation method, and the sample kurtosis values. The SB has been shown to more closely approximate Chi-Square than the usual test statistics, to have robust standard errors, and to perform as well or better than the usual asymptotically distribution-free methods generally recommended for non-normal multivariate data.

specified to include a correlational path leading from Active Principal Supervision to Confidence in Peers.[40]

Finally, application of the Wald Test to the re-specified model identified four nonsignificant causal paths. These parameters were subsequently deleted. This re-specification resulted in the same well-fitting, yet more parsimonious model.[41]

The final model is presented schematically in Figure 3. In this representation, the latent constructs are shown in boxes with the construct name. All indicators have been omitted from this representation in the interest of clarity. The lines between constructs indicate predictive relationships, with the arrowhead showing the predictive direction and the numbers on the lines the strength of the predictive relationship described by standardized beta coefficients (units of standard deviation difference in the predicted construct per one unit standard deviation difference in the predictor construct). The numbers presented at the bottom of the chart represent the percentage of variance explained by the model for the identified variable.[42]

Test of Model Replication

For purposes of cross-validation, the final model was tested for its replication across a second independent sample (validation sample) in two ways. First, the validation sample was fit to the original reduced structural model. Results revealed the validation data supported the previously derived structural model (CFI = 0.927, Robust CFI = 0.949). Second, each specified causal path was constrained equally across calibration and validation samples and then tested statistically. Judgment of replicability was based on the goodness-of-fit of the constrained model and the probability level of the equality constraints as determined by the LM-Test. Results revealed the model to be well-fitted (CFI = 0.940, Chi-Square $_{(890)}$ = 1490.011), with only 3 of the 16 equality constraints exceeding a 0.05 probability level. These findings argue for the statistical equivalence of the model structure across independent samples.

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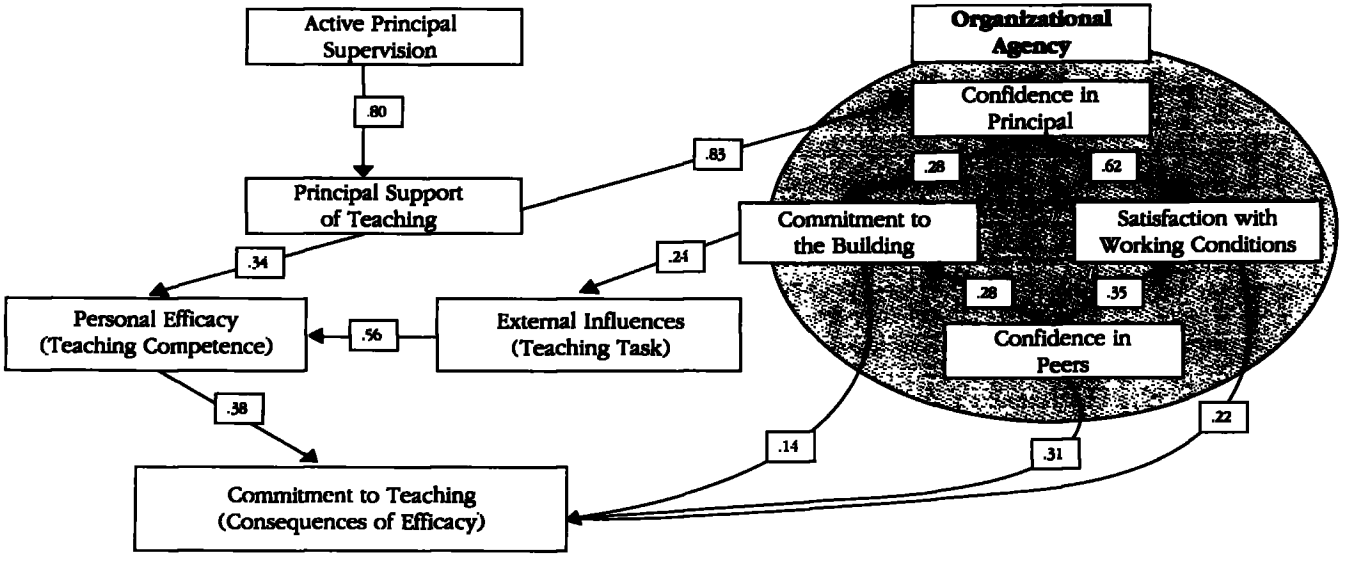
[40]To assess the extent to which the newly specified model exhibited an improvement in fit over its predecessor, the difference in Chi-Square between the two models was calculated. This differential is itself Chi-Square-distributed, with degrees of freedom equal to the difference in degrees of freedom and can therefore be tested statistically; a significant delta Chi-Square indicates a substantial improvement in model fit. Results of this comparison of models indicated a significant improvement and a better fitting model (CFI = 0.928, Robust CFI = 0.947).

[41]As expected, given findings of multivariate kurtosis noted earlier, the SB yielded a Chi-Square value that was substantially lower than the usual Chi-Square statistic (711.04 compared to 604.32).

[42]These values were calculated as one minus the square of the disturbance term.

Figure 3. Final Paths in Conceptual Model



Percent of Variance Explained by the Final Model

Principal Support of Teaching	65%	Commitment to the Building	23%
Confidence in Principal	65%	Satisfaction with Working Conditions	60%
Personal Efficacy	47%	Commitment to Teaching	55%
External Influences	6%		

The correlation between Active Principal Supervision and Confidence in Peers (r=0.32) has been omitted for clarity.

DISCUSSION

The hypothesized and final models of causal structure relating the multiple dimensions of organizational factors, principal supervision behaviors, and teacher efficacy beliefs were remarkably similar. Most of the suggested paths present in the final model are supported by the original Tschannen-Moran, Hoy, and Hoy model, the early correlation work carried out since the 1950s, and the findings of the more methodological advanced studies based on mediated-effects models.[43] Substantial overlap in the findings reported by Chase was also observed. This is significant because her study represents the only work parallel to this project. She focused on many of the same constructs (although measured and defined slightly differently) and constructed a similar path diagram.[44] The final structural model suggests some interesting hypotheses that have importance for the practice of supervision.

Usefulness of the Original Efficacy Model

Although this study was not designed as a strict test of the original Tschannen-Moran, Hoy, and Hoy model, the data collected for this analysis did support the majority of paths first suggested or implied by the model. This lends credence to the use of the Tschannen-Moran, Hoy, and Hoy model (or a modified version) not only to help understand the efficacy literature but also to help explain how teacher formative supervision might work in schools. It also helps better link the burgeoning field of efficacy research to the extant work in teacher evaluation. If the original model is modified as demonstrated by the tested model in this study (Figures 2 and 3), then other fields of research such as organizational theory might also be more clearly connected to the work in formative supervision in a predictable and meaningful way.

Clearly, important conceptual work clarifying the meaning and measure of the final efficacy estimator (Estimation of Teacher Efficacy) resulting from the interaction between the constructs of Teaching Task and Assessment of Teaching Competence needs to be undertaken before the original Tschannen-Moran, Hoy, and Hoy model can be fully examined. That is, the newly defined model needs to specify how the final estimate of teacher efficacy is different from or

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[43]P. Hallinger and R. Heck, "Reassessing the Principal's Role in School Effectiveness: A Review of Empirical Research, 1980–1995," *Educational Administration Quarterly* 32 (February 1996): 5–44.

[44]A. Chase, "School Level Factors Predicting Teachers' Senses of Professional Engagement, Efficacy, Commitment, and Job Satisfaction: An Application of Structural Equation Modeling," ED347693 (1991).

a combination of the two contributing efficacy constructs. Without this clarity, the model presents some interpretation problems and its applicability to other fields is limited. Given this limitation, however, the model tested in this study did lend support to the ideas about the development and maintenance of teacher efficacy first suggested by Tschannen-Moran, Hoy, and Hoy in their various publications. The original model is very helpful in building more complex models that help us understand the multiple paths between and among the actions of principals as they engage in supervision, organizational-level variables such as peer teacher support, and the various forms of teacher efficacy. Without the earlier conceptual work of Tschannen-Moran, Hoy, and Hoy, this study would not have been possible.

Importance of Valuing Teaching

When principals demonstrate an interest in the instructional process (the core business of teachers), it is predictable that teachers respond by developing more respect for and confidence in the principal. Indeed, 65 percent of the variance in Confidence in the Principal could be explained by the degree to which a principal supported good teaching. As others have noted and the data from this study support, this validation of the importance of the instructional process leads to greater satisfaction and commitment and the probability of instructional improvement.[45]

Active principal supervision in the form of frequent classroom observations and conferencing activities, although essential to teachers' professional development, as pointed out by Stiggins and Duke,[46] in itself does not directly influence a teacher's confidence, trust, or support of the principal. Results from this study indicate that the effects of principal supervision on teacher affective reactions (confidence, commitment, satisfaction) are obtained only through the extent to which teachers believe the principal is interested in and committed to supporting teaching. Active supervision helps set the stage but must be accompanied by other principal activities that focus on classroom teaching, such as placing greater emphasis on teaching, rewarding sound teaching, and providing technical and symbolic leadership.[47]

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[45]S. Zepeda and J. Ponticell, "At Cross-purposes: What Do Teachers Need, Want, and Get from Supervision?" *Journal of Curriculum and Supervision* 14 (Fall 1998): 68–87.

[46]R. Stiggins and D. Duke, *The Case for Commitment to Teacher Growth: Research on Teacher Evaluation* (Albany, NY: State University of New York Press, 1988).

[47]K. Peterson and J. Martin, "Developing Teacher Commitment: The Role of the Administrator," in *Teachers and Their Workplace: Commitment, Performance, and Productivity*, ed. P. Reyes (Newbury Park, CA: Sage Publications, 1990), pp. 225–240.

These activities help convince teachers of the high value the principal places on the instructional process. Similar observations were noted by Heck, Larsen, and Marcoulides when they examined the relationship between instructional leadership and student achievement.[48]

This implies that formal and often ritualized teacher evaluation practices common across many school districts are of little value in building teacher-principal relationships that lead to improvement of instructional practices. Only when the principal engages in activities that actively demonstrate commitment to teaching is there any real hope for building trust, increasing teacher commitment, and building individual teacher efficacy. In effect, the supervision practices common in our schools do not seem to be directly connected to any of the variables that influence individual teacher instructional improvement (building trust, increasing commitment to building goals, increasing commitment to teaching, general satisfaction with teaching, and personal efficacy). This partly explains the widespread disdain teachers generally have for teacher evaluation practices.[49] Teachers view the supervision process as a potential way for the principal to demonstrate commitment to teaching. If they believe the principal shows personal support for teaching as opposed to athletics, student control, parent special interests, and so forth, then confidence, commitment, and trust follow.

Importance of Peers

When teachers are supported by their peers as well as their principals, they are likely to take greater risks to improve their instruction, remain in the teaching profession, and show more interest in building activities and goals.[50] Indeed, support and commitment

[48]R. Heck, T. Larsen, and G. Marcoulides, "Instructional Leadership and School Achievement: Validation of a Causal Model," *Educational Administration Quarterly* 26 (May 1990): 94–125.

[49]S. Zepeda and J. Ponticell, "At Cross-purposes: What Do Teachers Need, Want, and Get from Supervision?" *Journal of Curriculum and Supervision* 14 (Fall 1998): 68–87; A. Blumberg, *Supervisors and Teachers: A Private Cold War*, 2nd. ed. (Berkeley, CA: McCutchan, 1980); P. Peterson and M. Comeaux, "Evaluating the Systems: Teachers' Perspectives on Teacher Evaluation," *Educational Evaluation and Policy Analysis* 12 (Spring 1990): 3–24; J. Cousins, "Using Collaborative Performance Appraisal to Enhance Teachers' Professional Growth: A Review and Test of What We Know," *Journal of Personnel Evaluation in Education* 13 (Spring 1995): 199–222.

[50]W. Hoy, J. Hannum, and M. Tschannen-Moran, "Organizational Climate and Student Achievement: A Parsimonious and Longitudinal View," *Journal of School Leadership* 8 (July 1998): 336–372; P. Lam, Y. Foong, and S. Moo, "Work Life, Career Commitment, and Job Satisfaction as Antecedents of Career Withdrawal Cognition Among Teacher Interns," *Journal of Research and Development in Education* 28 (Summer 1995): 230–235.

are linked and have been shown to be a critical aspect of effective schools.[51] From a student's perspective, increased commitment usually translates into extra time and energy devoted to helping students after school hours, greater interest in student welfare issues, increased interest in adopting instruction and curricula to fit student interests and needs, and an overall interest in increasing contact time with students. From a faculty member's perspective, there is widespread agreement that productive peer relationships are an important ingredient in improving teacher practice, getting better achievement results, and improving communications within the building.[52]

Results from this study and Chase's similar findings support the importance of peer trust in influencing commitment to building goals, commitment to teaching, and overall satisfaction with working conditions as suggested by the correlational literature base.[53] The paths supported by the data suggest that teachers' trust in and satisfaction with colleagues are directly responsible for a significant percentage of variance in the commitment and satisfaction variables.

However, principal supervision, although correlated with satisfaction and trust of peers, does not appear to be a causative factor. Teachers apparently view their colleagues as a unique source of influence—correlated to but not directly linked to the activities of the principal. This finding supports earlier path-analytic work by Hoy, Tarter, and Witkoskie, who reported that supportive principal leadership produced collegiality and trust in principals, but not trust in teacher colleagues.[54] Thus, while active principal supervision indirectly influences confidence in the administration (through a perceived support of teaching, as discussed above) and eventually satisfaction with working conditions, teacher satisfaction and trust of peers play a strong and direct role in teachers' commitment to building goals, commitment to teaching, and particularly teachers' satisfaction with building working conditions. Clearly, peers are very important to teachers and help shape in a major way their views of the

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[51]S. Rosenholtz, *Teachers' Workplace: The Social Organization of Schools* (White Plains, NY: Longman, 1989).

[52]R. Barth, *Improving Schools from Within* (San Francisco, CA: Jossey Bass, 1990); C. Tarter, D. Sabo, and W. Hoy, "Middle School Climate, Faculty Trust, and Effectiveness: A Path Analysis," *Journal of Research and Development in Education* 29 (Fall 1995): 41–49; and S. Rosenholtz, *Teachers' Workplace: The Social Organization of Schools* (White Plains, NY: Longman, 1989).

[53]A. Chase, "School Level Factors Predicting Teachers' Senses of Professional Engagement, Efficacy, Commitment, and Job Satisfaction: An Application of Structural Equation Modeling," ED347693 (1991).

[54]W. Hoy, C. Tarter, and L. Witkoskie, "Faculty Trust in Colleagues: Linking the Principal with School Effectiveness," *Journal of Research and Development in Education* 26 (Fall 1992): 38–45.

school environment. Principals influence these variables only indirectly through the building of confidence and trust in their leadership, which strengthens commitment to building goals and then commitment to teaching. Principals through the supervision process alone do not seem to have a direct impact on commitment to teaching or satisfaction with working conditions.

Supervision and Teacher Professional Commitment

Commitment to the core values of the school and the teaching profession has long been considered an indirect measure of school effectiveness. Gaining commitment of teachers increases the probability they will behave in ways consistent with organizational and professional goals; work more cooperatively and collaboratively with others; and seek ways to further the mission of the school and the profession. Peterson and Martin contend that through the culture of the school and the actions of the principal, this commitment can be enhanced by (1) increasing the clarity of the organizational mission; (2) developing consensus about norms, values, and beliefs; (3) structuring the nature of the reward system to reinforce desired school goals and norms; and (4) providing leadership that is technical and symbolic.[55]

Results from this study indicate commitment to the teaching profession is influenced by both the principal and peers, although not along the same paths. By providing support for teaching (symbolic leadership and increasing goal clarity), principals build confidence in the administration, which creates commitment to the building and ultimately generates commitment to teaching. Principals also influence commitment to teaching through enhancing personal efficacy. Indeed, Coladarci reported significant correlations between commitment and both personal and external efficacy, although data from this study indicate a more indirect relationship between external efficacy and commitment.[56] Peers more directly influence commitment to teaching through establishment of trusting relationships and establishment of satisfying working relationships. Pragmatically, this finding suggests that improving teacher retention in schools is really a function of making sure teachers establish functional and supportive relationships with other teachers and believe the principal cares about and supports teachers' efforts in the classroom.

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[55]K. Peterson and J. Martin, "Developing Teacher Commitment: The Role of the Administrator," in *Teachers and Their Workplace: Commitment, Performance, and Productivity*, ed. P. Reyes (Newbury Park, CA: Sage Publications, 1990).

[56]T. Coladarci, "Teachers' Sense of Efficacy and Commitment to Teaching," *Journal of Experimental Education* 60 (Summer 1992): 323–337.

Supervision and Teacher External Efficacy

A teacher's external efficacy (a belief that he or she can overcome external conditions such as low ability of entering students or inadequate supplies) does not seem to be greatly influenced by organizational variables. Only 6 percent of the variance in this factor is explained by the model. Similar results were obtained by Taylor and Tashakkari, who reported that school climate variables accounted for very little of the variance in teachers' sense of efficacy.[57] Although the principal does have some influence through a complex chain of variables (support of teaching to confidence in the principal to commitment to building goals to external efficacy), apparently most teachers form opinions about the teachability of a group of students primarily using cues from outside the school. If that is true, then school slogans such as "all children can learn" that are currently popular in the nation's school districts will have little influence on the external efficacy beliefs of teachers. If school districts wish to employ teachers with high external efficacy beliefs, it is probably better to focus on the initial selection practices in the human resource office than to attempt to change attitudes through the supervision process.

Supervision and Teacher Personal Efficacy

Teacher efficacy is often cited as a key to improving the quality of schooling and has been found to relate significantly to many valued outcomes, including teachers' classroom behavior, student learning, and change in teacher practice through staff development.[58] Bandura contends efficacy develops largely from four sources: information derived from actual performance; information derived from vicarious experiences, primarily from seeing or visualizing other people perform; information from verbal persuasion and the attempts of others to convince teachers they can perform particular tasks; and information derived from physiological indices such as trembling or sweating before or during a task. Increasing teacher efficacy in terms of Bandura's sources is typically operationalized by involving teachers in decision making about their classroom activities; supporting classroom innovations; encouraging collaboration among teachers; increasing clarity with regard to school goals; providing feedback to

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[57]D. Taylor and A. Tashakkari, "Predicting Teachers' Sense of Efficacy and Job Satisfaction Using School Climate and Participatory Decision Making" (paper presented at the annual meeting of the Southwest Educational Research Association, San Antonio, TX, 1994).

[58]M. Smylie, "Teacher Efficacy at Work," in *Teachers and Their Workplace: Commitment, Performance, and Productivity*, ed. P. Reyes (Newbury Park, CA: Sage Publications, 1990).

teachers about their classroom performance; and providing opportunities for teachers to observe the practice of other professionals.

Results from this study indicate an indirect linkage between supervision and personal teaching efficacy (personal ability to affect learning). This influence is transmitted through the teacher's belief in the principal's support of teaching and is a significant influence. Other influence comes from the external efficacy belief. If teachers believe they can overcome external conditions, this will strongly influence their beliefs about their own teaching competence. Taken together, these two variables account for about 47 percent of the variance. Principals likely influence personal efficacy by offering improvement assistance through coaching and praise. The conferencing often associated with supervision helps clarify important goals (as previously discussed) in addition to providing substantive feedback about the teacher's performance. In many cases, supervision is teacher directed, thus increasing the teacher's sense of control of classroom processes and staff development opportunities. The principal can also provide opportunities for teachers to observe other teachers or videotapes of best practice. This clearly increases a teacher's vicarious experiences, which Bandura identifies as essential for increasing a teacher's sense of efficacy. Finally, the close interaction between the principal and the classroom teacher through conferencing is a clear signal to the teacher of administrative support for innovations and teaching, which might lead to improved practice. This symbolism through a principal's focus on teaching during staff meetings and in internal communications undoubtedly plays an important role in building teaching efficacy.

CONCLUSIONS

Given the predictive power of the final model and its reproducibility using a distinct data set, the utility of constructing models that attempt to explain the mechanism by which principal supervision influences school-level factors seems warranted. The model developed in this study clearly indicates that the behaviors of school principals play important roles in the development of teacher efficacy, work satisfaction, and job commitment. It is also clear that this influence of principals is indirect. Principals' specific actions work only through a complex series of interactions with other intermediate variables. Sometimes this chain of intermediate variables is quite lengthy. The most potent predictors of efficacy, commitment, and job satisfaction are the relational constructs—those that represent a teacher's perceptions of his or her administrators as caring and concerned with the core business of the teacher's classroom. Chase re-

ported similar results.[59] A teacher's peers also play a profound and independent role in influencing commitment and satisfaction but have much less influence on individual teacher efficacy. Taken together, as Chase concluded and this study supports, the importance of principals' actions and peer influence suggest that if we wish to improve teachers' dispositions toward their work (and presumably effectiveness), we need to pay close attention to ways of improving teachers' perceptions of their relationships with those with whom they work.

It is also clear that supra-school factors play an important role in predicting teachers' relations with their peers, relations with administrators, and beliefs about themselves. Although the model presented in this study accounts for a significant amount of variance overall, some factors (Ability to Overcome External Conditions in particular) were poorly predicted by the latent variables included in the study. Clearly, additional work needs to be undertaken to identify influential factors that help account for variance in these constructs. Pragmatically, this indicates that much of the variance in these factors may be beyond the influence of the principal and peers and thus not amenable to change after the individual is employed.

Lastly, caution should be used when interpreting the results of this study. Although the developed model serves a useful purpose in helping to explain the supervision process, other models might be equally explanatory. In addition, many other variables and constructs could logically be included as predictors in future studies. This study focused primarily on teacher affective factors; other studies could concentrate on the principal's impact on observable teacher behaviors or student achievement—not just attitudes. In addition, as Byrne discovered when comparing teacher burnout across elementary and secondary teacher samples, alternate models might emerge and be more appropriate for different types of school organizations.[60]

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[59]A. Chase, "School Level Factors Predicting Teachers' Senses of Professional Engagement, Efficacy, Commitment, and Job Satisfaction: An Application of Structural Equation Modeling," ED347693 (1991).

[60]B. Byrne, "Burnout: Testing for the Validity, Replication, and Invariance of Causal Structure Across Elementary, Intermediate, and Secondary Teachers," *American Educational Research Journal* 31 (Fall 1994): 645–673.