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Reassessing the Principal's Role in School Effectiveness: A Review of Empirical Research, 1980-1995

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Although there is little disagreement concerning the belief that principals have an impact on the lives of teachers and students, both the nature and degree of this effect continues to be open to debate. The relationship is complex and not easily subject to empirical verification. This article reviews the empirical literature on the relationship between the principal's role and school effectiveness during the period from 1980 to 1995. We specifically focus on the conceptual underpinnings of several theoretical models to study the role, the relationship between models and methods of investigation, and, consequently, to what has been learned about the nature of the principal's impact. We conclude by framing a possible research agenda for the next generation of studies on the effects of school administration.

The belief that principals have an impact on schools is long-standing in the folk wisdom of American educational history. Studies conducted in recent decades lend empirical support to lay wisdom. Research on change implementation conducted during the 1970s identified the important role principals play in school-improvement efforts (Berman & McLaughlin, 1978; Fullan, 1982; Hall, Rutherford, & Griffin, 1982). Similarly, research on school effectiveness concluded that strong administrative leadership was among those factors within the school that make a difference in student learning (Brookover & Lezotte, 1977; Edmonds, 1979; Rutter, Maugham, Mortimore, Ouston, & Smith, 1979).

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Educational policymakers have been similarly inclined to believe that principal leadership is critical to the achievement of students (Murphy, 1990). Fueled by reports of the failure of the public schools, concerns for improving the achievement of students reached unprecedented levels in the early 1980s. In this light, research that focused on measures of student achievement held increasing salience for policymakers (Glasman & Heck, 1992).

Moreover, with fewer dollars available in many state and national economies during the 1980s, accountability became a driving force influencing the allocation of resources to education. As "waves of reform" gained momentum over the past decade, government at all levels has become increasingly active in seeking to manipulate student outcomes through changes in educational policy, structure, and training (Hallinger, 1992; Murphy, 1990). This is reflected in diverse reforms such as school-based management, administrative academies, shared decision making, charter schools, privatization, and parental choice.

Given apparent support from the research community, policymakers now tend to view the principal as a key educational input, and one easily accessed through policy channels. Thus during the period from 1975-1990, the policy of state-mandated principal evaluation increased from 9 to 40 states (Peters & Bagenstos, 1988; Snyder & Ebmeier, 1992). Similarly, state, national, and international investment in the in-service training of principals increased dramatically during this same period (Hallinger, 1992; Murphy, 1990).

Although at the hortatory level there is little disagreement concerning the belief that principals have an impact on the lives of teachers and students, both the nature and degree of that effect continues to be open to debate (Pitner, 1988; van de Grift, 1990). At the outset of this review, we must admit that this relationship is complex and not easily subject to empirical verification. Our own perspective is that the principal's role is best conceived as part of a web of environmental, personal, and in-school relationships that combine to influence organizational outcomes (e.g., Hallinger, Bickman, & Davis, 1990, in press; Heck, Larsen, & Marcoulides, 1990). Unfortunately, as prior reviewers of this literature have concluded, the tradition of principal-effectiveness studies has not generally done justice to this complexity in terms of either theoretical or methodological sophistication (e.g., Bossert, Dwyer, Rowan, & Lee, 1982; Boyan, 1988; Bridges, 1982; Erickson, 1967; Leithwood, Begley, & Cousins, 1990; Murphy, Hallinger, & Mitman, 1983; Pitner, 1988; Rowan, Dwyer, & Bossert, 1982).

Nonetheless, during the past 15 years researchers have increased their attention to this issue. Given the expanded effort to study the relationship between principal leadership and student outcomes during this period, we believe an updated review is warranted. This review examines conceptual features of the most recent generation (1980-1995) of studies conducted into the role of principal leadership in school effectiveness. Although we focus on the conceptual underpinnings of this empirical literature, we refer to methodological and substantive findings as they intersect with conceptual issues.

We begin by identifying the lineage for this review. Next, we consider methodological, conceptual, and substantive issues as they emerged in our analysis of the studies. The article concludes with an attempt to frame an agenda for research on the principal's role in school effectiveness for the next generation of studies.

THE PERSPECTIVE FOR THIS REVIEW

Any attempt to integrate a body of research into a coherent conceptual framework that analyzes conceptual, substantive, and methodological issues must acknowledge its limitations. The field's conceptualization of organizational processes, including the leadership construct, is constantly evolving (Glasman & Heck, 1992; Hallinger, 1992; Leithwood & Hallinger, 1993). Hence we assert that no universal paradigm or theory exists for examining organizational behavior that is valid in all contexts. Moreover, the complexity of extraorganizational and intraorganizational processes represents a particular challenge for researchers who study causal relationships involving leadership and school effectiveness (Bossert et al., 1982; Boyan, 1988; Marcoulides & Heck, 1993; Pitner, 1988). Although a perusal of the professional literature of the 1980s and 1990s would suggest that we have learned much about the principal's role in school effectiveness, we began this review with a cautious eye toward such claims.

We chose to demarcate our review with the year 1980 in recognition of landmark efforts that reviewed research up to this date. In our view, the summer 1982 issue of the *Educational Administration Quarterly* marked a turning point in the recent study of educational administrators and their effects on schooling. Contained in this issue were two articles, *Research on the school administrator: The state-of-the-art, 1967-1980* (Bridges, 1982) and *The instructional management role of the principal: A review and preliminary conceptualization* (Bossert et al., 1982). These reviews examined research on principal leadership conducted during the previous decade and more. Interestingly, the reviews drew quite different conclusions. Based on his assessment of the literature, Bridges (1982) concluded:

> Research on school administrators for the period 1967-1980 reminds one of the dictum: "The more things change, the more they remain the same." The state-of-the-art is scarcely different from what seemed to be in place 15 years ago. Although researchers apparently show a greater interest in outcomes than was the case in the earlier period, they continue their excessive reliance on survey designs, questionnaires of dubious reliability and validity, and relatively simplistic types of statistical analysis. Moreover these researchers persist in treating research problems in an ad hoc rather than a programmatic fashion. Equally disturbing is the nature of the knowledge base accumulated during this period. Despite the rather loose definition of theory that was used in classifying the sample of research . . . , most of it proved to be atheoretical. Likewise the research seemed to have little or no practical utility. (pp. 24-25)

This conclusion was sobering for those who hoped that research might assist in solving problems of educational policy and practice in educational administration.

In contrast, Bossert and his colleagues (1982) at the Far West Laboratory for Research and Development suggested that principals could have a positive impact on a variety of in-school factors, and at least indirectly affect the achievement of students. The Far West Lab group's assessment was supported by independent reviews conducted by scholars at the Ontario Institute for Studies in Education (Leithwood & Montgomery, 1982), the Santa Clara (CA) County Office of Education (Murphy et al., 1983), and the Connecticut State Department of Education (Sirois & Villanova, 1982). Although not blind to methodological problems of the literature, their conclusions were distinctly more optimistic than those of Bridges. The incongruence of these conclusions was both startling and difficult to reconcile at the time. If the methodological and conceptual state-of-the-art was as Bridges suggested, how could other respected scholars draw such dissimilar conclusions?

In retrospect, it may be explained by several factors. First, Bridges' review did not include the venues that were featuring the early effective schools research. Yet these studies formed an important body of evidence for the other reviews. Second, the school effects research was comprised of general investigations into the effectiveness of schools. The research questions and designs, therefore, were not intended to test the effects of principals on school outcomes (Miskel, 1982; Rowan et al., 1982). Thus these studies may not have met Bridges' selection criteria even if they had appeared in the journals included in his review.

Third, it would be fair to say that the foci differed. Although Bridges was primarily concerned with methodological issues, the other reviewers evinced greater interest in conceptual linkages within the literature and on the direction of substantive results. They also were more eclectic and drew on studies from a variety of sister domains (e.g., school improvement, management).

Finally, it is also true that if the early effective schools studies had been included in Bridges' review, they would have been aptly characterized by several elements noted in his methodological critique. The effective schools research relied heavily on cross-sectional survey research and tended to be atheoretical in the selection and modeling of variables. Moreover, the research designs and statistical methods were not always up to the task of determining causal relationships.

Together, these factors explain the incongruence in findings drawn from reviews conducted at the same time. In a sense, however, these reviews all predated a new generation of research on principal effectiveness. During the 1980s, stimulated by findings from the school effectiveness literature, researchers began to reconceptualize the principal's leadership role and lay the groundwork for more systematic empirical investigation (Bossert et al., 1982; Hallinger & Murphy, 1985; Leithwood & Montgomery, 1982; Sirois & Villanova, 1982).

Instrumentation developed from this conceptual work made it possible to design studies that would more reliably determine the nature and effects of the principal's role behavior in this domain (e.g., Hallinger & Murphy, 1985; van de Grift, 1990; Villanova, Gauthier, Proctor, & Shoemaker, 1982). Increased attention to emerging analytical techniques, such as structural equation modeling and hierarchical linear modeling, further allowed researchers to explore more complex theoretical models of leadership effects (e.g., Hallinger et al., in press; Heck & Marcoulides, 1992; Rowan, Raudenbush, & Kang, 1991; Silins, 1994).

The decade following publication of these reviews in 1982 was fruitful, at least if measured by the number of studies. Interim reviews of research have been conducted by competent scholars (e.g., Leithwood et al., 1990; Murphy, 1988). This article extends their work in terms of the period of time covered, through its explicit inclusion of international studies, by examining both conceptual and substantive issues, and by focusing explicitly on the issue of principal effects on school and student outcomes.

Identification and Selection of Studies for Review

We began the review with a search of the ERIC (*Resources in Education*) and CJIE (Current Journals in Education) databases and used these sources as well as personal knowledge of published and presented research to identify additional studies. Consequently, the review includes journal articles, dissertation studies, and papers presented at peer-reviewed conferences. We are

reasonably confident that the article has captured most of the empirical studies of principal effects disseminated internationally between 1980 and 1995.

Three criteria guided selection of studies. First, we sought studies that had been designed explicitly to examine the effects of the principal's leadership beliefs and behavior. The research must have conceptualized and measured principal leadership as one of the independent variables. The nature of the conceptualization of leadership was not considered at the point of selection.

Second, the studies also had to include an explicit measure of school performance as a dependent variable. Most often performance was measured in terms of student achievement, but occasionally other definitions of effectiveness were also used. It was our desire, though not a necessary condition for inclusion, to also identify studies that examined the principal's impact on teacher and school-level variables as mediating factors. The dual focus reflects the priority that we assign to student outcomes as an important goal for school improvement and to classroom and school-level variables as the avenues through which principals reach this goal. We acknowledge that concerns can be raised about the validity and reliability of student achievement measures. We felt, however, that the policy implications of such outcomes (e.g., student achievement, school effectiveness) outweigh the potential concerns within this domain of study. Notably, however, we did not include studies that examined principal effects on intervening variables if they did not also incorporate some measure of school outcomes. This criterion especially shifted the focus toward studies of leader effects, as opposed to the principal's work. Consequently, some qualitative studies were picked up as well.

Third, given the growing interest in international perspectives on school improvement, we made an effort to seek out studies that examined the effects of principals conducted outside the United States. Although we do not undertake comparative analysis in this article, the review includes 11 studies conducted in countries outside the United States including Canada, Singapore, England, the Netherlands, the Marshall Islands, Israel, and Hong Kong.

Using these criteria, we identified 40 studies that explored the relationship between principal leadership behavior and school effectiveness (see Table 1). Twenty-three of the studies were published in blind-refereed journals. Eight were presented as papers at peer reviewed conferences. Six were dissertations. Two were book chapters and one was a synthesis of studies conducted by the author. Of the 40 studies, we were unable to obtain two papers (Edington & Benedetto, 1984; Teddlie, Falkowski, Stringfield, Desselle, & Garvue, 1983).

(Text continues on page 14)

TABLE 1
Characteristics of Principal-Effects Studies

				Analytic Technique					
		Dependent			*T Test*	*ANOVA/*		*Structural/Path*	
Study Author	*Sample Type*	*Variable*	*Description*	*Correlation*	*Chi Square*	*MANOVA*	*Regression*	*Modeling*	*Effects*
Model A: Direct effects									
Braughton, 1991*	70 tch/20 es	1					X		None
Cantu, 1994	96 tchers, 6 es	2				X			None
Glasman, 1981	29 studies	1			X				None
Glasman, 1983	210 pr & tch	2	X						Yes
Glasman, 1984	302 pr	2	X						None
Glasman, 1992	35 pr	2	X						Yes
Glasman/F, 1992	20 pr	2	X						Yes
Hunter, 1994*	52 ms; 331 tch, 52 pr	2			X				Mixed
O'Day, 1983*	140 tch/19 es	1		X	X	X			None
Ruczieska, 1988*	155 tch/11 es, ms	2		X	X				Mixed
Van de Grift, 1989	182 pr	1		X					None
Van de Grift, 1987	139 pr	1		X					Mixed
Van de Grift, 1990*	104 es	1						X	None

(continued)

TABLE 1: Continued

Study Author	*Sample Type*	*Dependent Variable*	*Description*	*Analytic Technique*					*Effects*
				Correlation	*T Test Chi Square*	*ANOVA/ MANOVA*	*Regression*	*Structural/Path Modeling*	
Model A-1: Direct effects with antecedent effects									
Andrews, 1987	33 es	1			X				Yes
Blank, 1987	32 hs	1, 5				X			Mixed
Brewer, 1993	2070 hs st	1					X		Yes
Cheng, 1991	64 hs	4				X			Yes
Cheng, 1994	190 es	1, 3		X	X				Mixed
Dilworth, 1987	77 tch	1					X		None
Krug, 1986	193 tch/11 es	2		X					Mixed
Ramey, 1982	193 tch/19 es	1						X	None
Rowan, 1984	142 es	1					X		Mixed
Model B: Mediated effects									
Jackson, 1982*	8 elem	2	X				X		Yes
Biester, 1984	8 elem	2	X						Mixed
Crawford, 1985*	94 elem, ms, hs	1						X	Mixed
Eberts, 1988*	300 pr	1					X		Yes
Silins, 1994*	265 pr	3						X	Yes
Model B-1: Mediated effects with antecedent effects									
Bamburg, 1990	61 es	1				X			Yes
Goldring, 1994	34 es	1					X		Yes
Hallinger, 1986	10 es	2	X						N/A
Hallinger, 1990	87 es	2						X	Yes
Heck, 1990	200 tchers/30 el, hs	2						X	Yes
Heck, 1991	71 tch/4 es, hs	2					X		Yes
Heck, 1993	138 tch/26 hs	2					X		Yes
Heck/Hallinger**	70 tch/20 es	1						X	Yes
Heck/Hallinger***	104 es	1						X	Yes
Jones, 1987	27 hs	1		X			X		None
Leithwood, 1993	770 tch/272 sch	3		X			X		Yes
Leithwood, 1994	varied	3						X	Yes
Ogawa, 1985	275 es, hs	1				X			Yes
Scott, 1987	250 tch/76 es	1						X	None
Weil, 1984	20 es	1, 2, 6				X		X	Mixed
Model C: Reciprocal effects									
Hallinger, 1990	87 es	2						X	N/A
Heck, 1990	200 tchers/30 el, hs	2						X	N/A

Dependent variables: 1 = student achievement; 2 = school effectiveness; 3 = teacher perceptions of school effectiveness; 4 = organizational effectiveness; 5 = attendance; 6 = student self-concept.

*Antecedent variables were limited to controlling for exogenous effects on achievement.

**Reanalysis of Braughton and Riley (1991).

***Reanalysis of van de Grift (1990).

STUDYING THE PRINCIPAL'S ROLE IN SCHOOL EFFECTIVENESS

With this overview in mind, we will briefly address selected methodological issues that impinge on our understanding of the conceptual and substantive results. Next, we discuss the range of theoretical models that have been proposed for the study of the principal's role in school effectiveness. We present a conceptual scheme adapted from Pitner (1988) for classifying nonexperimental studies of principal effects. Then we analyze the studies in terms of their underlying theoretical models and discuss the substantive results of the studies within each category.

Notes on Methodology and Research Design

It is not our intention to focus on methodological issues. At the same time, we would be remiss in ignoring this domain entirely (see Hallinger & Heck, in press). This is particularly true because the studies demonstrate marked improvement over the prior generation of studies

Although our selection criteria weighed heavily toward quantitative studies, both qualitative and quantitative analyses were used in several studies. In our view, quantitative methods are essential for assessing the extent to which administrative effects are present in schools. The use of qualitative approaches is essential, however, if we are to understand the more complex processes that underlie this complex set of interactions (e.g., Dwyer, 1986). In this light, the dearth of mixed-method studies is disappointing.

Frame of reference. In 1982, Bridges concluded that the frame of reference for studies in educational administration tended to be neither theoretical nor practical. Despite considerable variation in the extent of theoretical grounding, as a group these studies demonstrate notable progress in the theoretical domain.

As Pitner (1988) suggested in her earlier review, several models roughly constituting a theoretical framework provide a useful means of representing how researchers have conceptualized the principal's role. Some studies we reviewed, for example, simply seek to establish whether relationships exist between the principal's leadership and dependent variables including, but not limited to, school achievement. The purpose of these studies has often been to address a question of practical interest (e.g., how principals in high- or low-achieving schools differ in terms of their attitudes, beliefs, or behavior). Most often, these studies have not been primarily concerned with theory

building in the sense of adding to our understanding of broader issues (e.g., how organizational processes are affected by contextual factors and how these sets of processes affect outcomes produced). These studies tended to cluster into what we will later describe as direct-effects studies (see Models A and A_1 in Figure 1 below).

In contrast, a number of researchers have been explicit in their attempt to link empirical efforts to theoretical issues involving relationships among school environment factors, principal leadership, in-school processes, and school outcomes (e.g., Goldring & Pasternak, 1994; Heck et al., 1990; Jones, 1987; Leitner, 1994; Silins, 1994). Such studies tend to present more complete theoretical models and give attention to the replication of findings across a variety of contextual conditions. They may also test competing theoretical models (e.g., Hallinger et al., in press; Silins, 1994). Besides their increased attention to broader theoretical issues, these studies tend also to use more sophisticated designs and analytical techniques by which to test their data against the proposed theoretical relationships (see Models B, B_1, and C in Table 1).

The relationship between theoretical models proposed, methods of investigation, and results is not the only one which can be drawn from these studies. It does offer, however, one useful benchmark for differentiating between efforts that are primarily empirically or theoretically driven. By our measure, at least one third of the studies could be classified as being theoretically driven. Overall, this represents significant improvement over the picture depicted by Bridges in 1982, who termed research in the field as *intellectual random events*. Moreover, the studies as a group show a very clear longitudinal effort to build on the conceptual and methodological work of others.

Research design. Almost all of the studies identified in our search used a cross-sectional, correlational design. Most often the investigators used surveys or interviews as their methods of data collection. Studies of this type have been labeled under the broad design type of nonexperimental research (Pedhazur & Schmelkin, 1991) in that the independent variables are not manipulated as they are in experimental or quasi-experimental designs. Furthermore, this nonexperimental mode of research does not assign subjects to groups through randomization.

In theory, experimental designs are better equipped to make determinations of causation than are correlational designs. However, in practice, experimental research is difficult to implement in a domain where the unit of analysis is the school. Although the use of nonexperimental designs to study causal relationships is a complex and often uncertain affair, the ability to

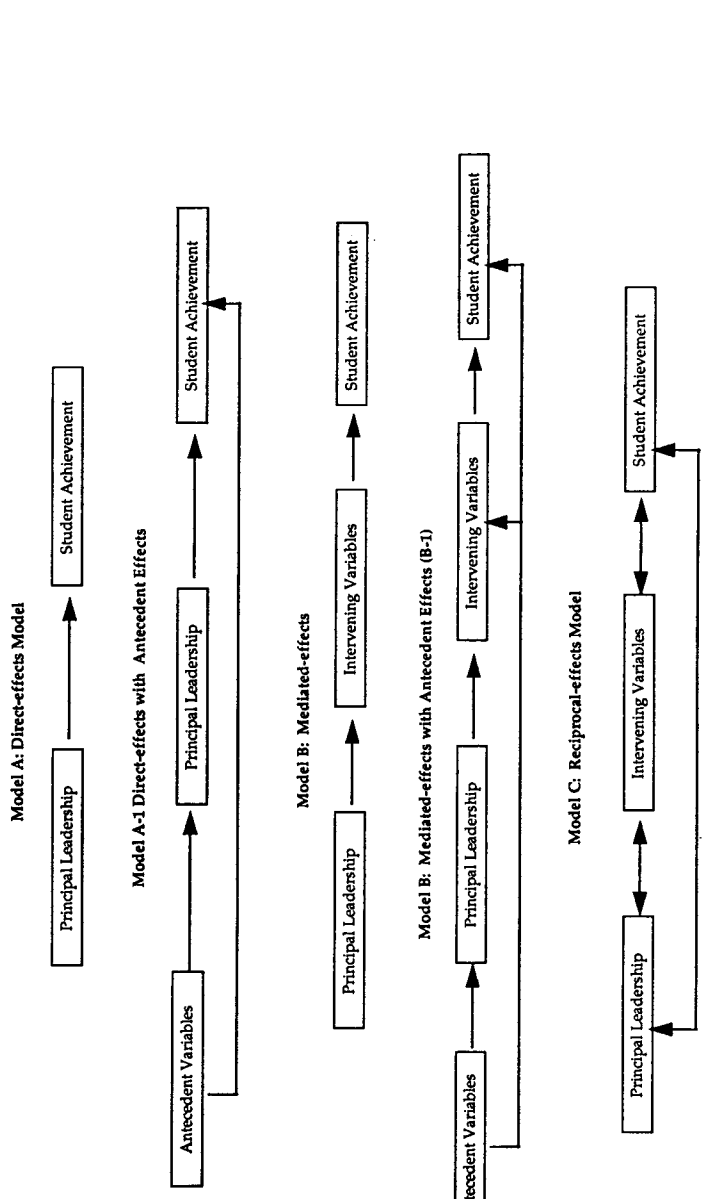

Figure 1: Modeling Principal Effects on School Effectiveness
NOTE: Adapted from Pitner, 1988, pp. 105-108.

exploit large samples using sophisticated data analysis techniques can compensate to some degree for other limitations (Pedhazur & Schmelkin, 1991; Pitner, 1988).[1]

A point of departure in understanding the implications of these three broad classes of research design (i.e., nonexperimental, quasi-experimental, and experimental) is that in both experimental and quasi-experimental designs causal inferences are made from the independent variables to the dependent variables. In contrast, in nonexperimental designs, these inferences are generally made in the opposite direction (Pedhazur & Schmelkin, 1991). The researcher attempts to account for change in the dependent variable(s) by uncovering the operation and effects of relevant independent variables. Unless guided by strong theory, appropriate model specification can become a problem in nonexperimental studies because one must include all relevant independent variables to specify the model properly. Thus the major threat to validity stems from uncontrolled confounding variables. Typical approaches to control include subject selection (i.e., probability sampling), statistical adjustment (Pedhazur & Schmelkin, 1991), and replication of results under varying conditions (Heck & Marcoulides, 1992). These are critical points to bear in mind when assessing the contribution to knowledge made by these nonexperimental studies.

Two further design issues should be considered. First, as implied above, in nonexperimental research the complexity of relationships explicated in the tested model plays an important role in interpreting the results. Overly simplified theoretical models often lead to overly simplistic analyses and results that are either highly ambiguous or lack validity. In the absence of an explicated theoretical model, the researcher often cannot be sure what has been found.

Second, the appropriateness of analytical techniques used by the researcher affects the strength of the conclusions. More rigorous analyses may uncover relationships in the data that are not revealed through other means. At the same time, they may also lead to fewer findings of substance than may be claimed in studies that rely on less rigorous methods (Pedhazur & Schmelkin, 1991).

Modeling the Principal's Role in School Effectiveness

Pitner (1988) identified a range of approaches that might be used to study administrator effects through nonexperimental research. These include direct-effects, antecedent-effects, mediated-effects, reciprocal-effects, and moderated-effects models (pp. 105-108). These models offer different perspectives for viewing the principal's role in school effectiveness.

Our adaptation of Pitner's classification system is depicted in Figure 1. Although Pitner (1988) distinguished between moderated-effects and antecedent-effects models, we did not find the distinction useful for the purposes of this conceptual analysis of the studies. When classifying the studies, the distinction between antecedent-effects and moderated-effects models seemed to turn more on methodological rather than conceptual criteria. Given the orientation of this review, we chose not to include the moderated-effects model. We discuss the methodological implications of this issue in detail elsewhere (see Hallinger & Heck, in press).

Using this conceptual framework, we content-analyzed the studies listed in Table 1. Working independently, we each classified the studies. After comparing our completed schemes, we resolved several discrepancies and triangulated our results with previous reviews (e.g., Bridges, 1982; Erickson, 1967; Pitner, 1988). Note that Table 1 actually includes 40 studies. The two additional studies represent our own reanalyses of data drawn from two of the studies that we collected (i.e., Braughton & Riley, 1991; van de Grift, 1990). In these cases, we reanalyzed the data using an alternative conceptual model to determine whether the theoretical model tested affected the findings observed (see Table 1).

A *direct-effects model* (Model A, Figure 1) proposes that the leader's effects on school outcomes occur primarily in the absence of intervening variables. The researcher using this model does not statistically control for the effects of mediating variables. Therefore, studies using a direct-effects model are typically bivariate in nature (e.g., O'Day, 1983). Recently, more sophisticated analytic techniques, such as structural equation modeling, have also been used to assess the direct relationship between leadership and school outcomes (e.g., Hallinger et al., in press; van de Grift, 1990).

Although direct-effects studies are common in the literature, they have been criticized for making untenable assumptions about the nature of leadership (Rowan et al., 1982). In such studies, the process by which administrators achieve an impact is hidden in a so-called *black box*. A relationship is empirically tested, but the findings reveal little about how leadership operates. Thus these studies do little to advance our theoretical or practical understanding of the school processes through which the principal achieves an impact on school effectiveness.

A *mediated-effects* model (Model B, Figure 1) assumes that some or all of the impact attained by administrators on desired school outcomes occurs through manipulation of, or interaction with, features of the school organization. This is consistent with the notion that managers achieve their results through other people. Mediated-effects studies, therefore, contribute more than direct-effects studies to theory building.

A third model identified by Pitner (1988) is the *antecedent-effects* model. Here "the administrator variable stands as both a dependent and an independent variable" (Pitner, 1988, p. 106). As a dependent variable, administrative behavior is subject to the influence of other variables within the school and its environment. As an independent variable, the administrator influences the actions of teachers, the school organization, and, ultimately, the learning of pupils (Bossert et al., 1982; Hallinger & Murphy, 1986a; Leithwood et al., 1990; Rowan et al., 1982).

Thus within this framework we can view the impact of principal actions on outcomes as either direct effects or mediated effects (see Models A and B in Figure 1). At the same time, we can combine an antecedent-effects model with either a direct-effects model or a mediated-effects model. These combinations produce more comprehensive portrayals of the principal's role in school effectiveness. In Figure 1, the addition of the antecedent-effects model to the direct-effects model is referred to as Model A_1. When the mediated-effects model is combined with the antecedent-effects model, we will refer to this combination as Model B_1 (see also Table 1).

A fourth conceptual approach to understanding administrator effects is the *reciprocal-effects* model (Model C). Scholars have noted that the relationship between the administrator and features of the school and its environment is interactive. This conceptualization suggests that administrators adapt to the organization in which they work, changing their thinking and behavior over time. To the extent that leadership is viewed as an adaptive process rather than as a unitary independent force, the reciprocal-effects perspective takes on increased salience.

When using the prior models (Models A, A_1, B, B_1), the researcher conceives of leadership as a variable that acts on other in-school variables, in response to environmental factors, or both. In contrast, a reciprocal-effects model posits leadership as an interactive process in which the leader simultaneously acts on, and responds to, features of the school and its environment. When using this type of model, the researcher further entertains the possibility that causal relationships may be bidirectional and change over time (see Figure 1).

Table 1 presents our classification of the studies. As is apparent, the studies most frequently used antecedent-effects, direct-effects, and mediated-effects models. Furthermore, there is a trend over time in which researchers are moving from simple direct-effects studies to the use of more complex models. Next we review the studies using this classification scheme.

Model A: Direct-effects without antecedent variables. Prior to 1980, researchers in this domain generally confined empirical investigations to the

study of direct effects of principal leadership on student learning (Bridges, 1982). In most cases, this involved examining the relationship between principal leadership and student learning without control variables. Bridges (1982) decried this research design as inadequate given the complexity of the relationship.

Thirteen of the 40 investigations included in this review fit the characteristics of direct-effects studies of the Model A variety (see Table 1). Each analyzed the relationship between principal leadership (e.g., attitudes, behavior, decision-making skills) and student achievement in the absence of other features of the school organization. Our assessment of these studies also indicates considerable variation in how researchers defined and used variables in the analysis.

Several studies did include one or more antecedent variables, such as student socioeconomic status (SES) or prior achievement in their data analysis. As a group, however, the studies do not explore possible antecedent effects on principal leadership. For example, several researchers used control variables such as SES or prior achievement of students simply to control for exogenous effects on student achievement. They did not (or could not) model for the hypothesized influence of these variables on the leadership of the principal (e.g., Braughton & Riley, 1991; van de Grift, 1990).

In one study, for example, van de Grift (1990) used a structural model to examine the effects of leadership on student outcomes. He found no direct relationship between leadership and school outcomes—a finding that is often quoted as evidence that principals (at least in the Netherlands) do not impact school outcomes. He included a measure of SES, but only tested a direct-effects model (i.e., SES and principal leadership) on school outcomes. Thus the possible direct effects of SES on principal leadership and the potential indirect effects of SES on outcomes through principal leadership were not illuminated.

It is interesting to note that the findings from these studies reveal either no effects or, at best, weak effects. When effects are claimed, we must interpret them with caution. As noted above, these studies use a simplified model to study a complex set of relationships. The studies do not account for the possible influence of important school and environmental conditions that influence principal leadership, in-school processes, and student outcomes. Even with control variables, it is not clear what has been found when the results reveal a positive relationship.

Model A_1: Direct effects with antecedent variables. Model A_1 studies employ a direct-effects approach as in Model A, but also account to varying degrees for personal characteristics of the principal, features of the school's organizational and environmental context, or both. The addition of antecedent variables to the direct-effects model was an important step forward for research in this domain. As noted by Bossert and his colleagues (1982), conceptualization of the principal's role in school effectiveness has too often involved untenable assumptions about how leadership is exercised in schools.

> Like earlier leadership studies . . . no single style of management seems appropriate for all schools . . . principals must find the style and structures most suited to their own local situation . . . a careful examination of quantitative studies of effective schools . . . suggests that certain principal behaviors have different effects in different organizational settings. Such findings confirm the contingency approach to organizational effectiveness found in current leadership theories. (Bossert et al., 1982, p. 38)

This highlights the importance of examining principal leadership within the context in which it is exercised. Without accounting for the context, it is difficult to draw accurate conclusions concerning the applicability of the findings to real settings. Antecedent-effects studies help shed light on potentially important relationships both between the context and leadership and between characteristics of the principal as a person and the enactment of leadership.

Historically, the effects of environmental and organizational constraints on the leadership of middle managers have been underestimated in studies of principal effectiveness (Bridges, 1982; Hallinger & Murphy, 1986b; Leithwood et al., 1990). This is reflected in Model A conceptualizations, which fail to take into account the effects of context variables on the exercise of the principal leadership. That the context of the school shapes students' classroom experiences is well established (e.g., Barr & Dreeben, 1983; Oakes, 1989). Both quantitative and qualitative studies confirm the appropriateness of conceptualizations that posit exogenous or antecedent variables as influencing the exercise of principal leadership. School characteristics, such as community type and homogeneity, school size, student socioeconomic status, and school level, have been found to influence how principals approach their jobs (e.g., Goldring, 1990; Hallinger & Murphy, 1986a; Leithwood et al., 1990).

Furthermore, research suggests that personal characteristics also influence how principals enact their role (Boyan, 1988; Hallinger & Murphy, 1986a, 1986b; Leithwood et al., 1990). These antecedent variables include gender, prior teaching experience, and values and beliefs of the administrator (Bossert et al., 1982; Dwyer, 1986; Glasman, 1983, 1984).

Nine of the studies used direct-effects designs with an analysis of context, antecedent variables, or both (see Table 1). With three exceptions (Andrews & Soder, 1987; Brewer, 1993; Cheng, 1991), these studies found either relatively weak effects or no effects of principal leadership on school achieve-

ment. As suggested above, part of the problem with the ambiguity of findings can be traced to the analytical methods used in Models A and A_1. In many cases, we feel that the designs were not up to the task of reliably determining effects (see Table 1).

Analytical methods also come into focus when interpreting the uneven results concerning the impact of antecedent variables on principal leadership. Even where an impact on leadership is identified (e.g., Andrews & Soder, 1987), the studies do not test for antecedent effects on leadership and leadership effects on outcomes simultaneously nor do they usually control for antecedent effects on leadership before assessing the direct effects of leadership on outcomes.

Although desirable, these approaches optimally call for methods capable of measuring both direct and indirect effects (e.g., path analysis using regression or structural equation modeling). At a minimum, such designs require the use of analysis of covariance or two-way analysis of variance (without determining indirect effects specifically), even though these techniques are more appropriately used in experimental research (Pedhazur & Schmelkin, 1991).

Often, however, other design problems (e.g., small sample sizes) limited the analytic techniques to simple *t* tests or one-way analysis of variance. To illustrate this point, Blank (1987) examined several environmental effects on principal leadership in the first part of his study. Then he explored the relationship between leadership and outcomes. However, no attempt could be made to link environmental variables to school outcomes either directly or indirectly; nor was he able to control the antecedent variables before examining principal leadership effects on outcomes. These limitations resulted from the small number of schools in the study (33). This precluded the use of tests other than one-way analysis of variance.

This approach suffers from two interrelated problems. First, in light of the *black box* critique noted earlier, the finding of no effects is no more revealing than the findings of positive effects in other Model A studies. Second, the neglect of possible direct effects of antecedent variables on principal leadership (as well as indirect effects on achievement) leaves us in the dark as to why principals in this context appear not to have an effect on student achievement.

The Braughton and Riley (1991) study represents an interesting example of how the conceptual limitations of a Model A_1 study can lead researchers to ignore the full potential of their data set at the point of analysis. In this case, the researchers used multiple regression to assess relationships among a variety of teacher-related, administrator-related, and achievement variables. This analysis could have been used in a path-type model, or to determine

interaction effects among the independent predictors of leadership and prior school achievement on teacher behavior and resulting student achievement. Yet these effects were not tested, leaving unexplored issues within their data set.

One interesting variation methodologically within this model is the study conducted by Rowan and Denk (1984). They investigated the relationship between principal succession (as a proxy measure of leadership) and school outcomes using longitudinal data (more than 6 years). They reasoned that if principal leadership affects school-level academic performance, such effects should be visible as schools experience changes in principals. The findings revealed SES-related differences among schools. Principal change had a larger effect on academic achievement in low-SES schools than in high-SES schools. Stated differently, community SES specified the effect between leadership succession and academic outcomes. For low-SES schools, the effects of leadership were significantly present, whereas in high-SES schools the relationship was negligible.

With the exception of Rowan and Denk (1984), the other studies in this group tested antecedent effects on leadership and leadership effects on outcomes separately. In our judgment, this is a theoretically and methodologically limited approach. It fails to capitalize on progress that has been made in conceptualizing leadership as a contextually dependent variable. Methodologically, it fails to exploit fully the power of current analytical techniques.

One exception to the trend of substantive findings within this group of studies is represented in the study of Andrews and Soder (1987). They concluded first that a significant relationship existed between leadership and student outcomes across all schools for reading and math improvement. When school socioeconomic status was introduced (i.e., separate analyses were conducted for high- and low-SES schools), however, all significant relationships between leadership, math, and reading outcomes disappeared for high-SES schools, while holding for low-SES schools. The same general pattern of leadership effects also held when the sample was dichotomized by ethnicity (disappearing for predominantly White schools and holding for minority schools).

These researchers were not able to consider possible interactions between ethnicity and SES in their analysis because of the small sample size. In this study, therefore, the more complete conclusion is that socioeconomic status and ethnicity specify the effects of leadership on school outcomes. We must adopt this more constrained interpretation because the direct and indirect effects of environmental conditions were not tested on both leadership and outcomes as, for example, would be the case when using path analysis.

Among the Model A_1 studies, two trends emerge. First, we begin to see initial support for the notion that environmental factors have effects on a

variety of elementary school processes, including the exercise of principal leadership. Though the exploration of this relationship is not fully tapped in these studies, the finding is of importance when viewed in the larger context of research in this domain. The Model A_1 studies thus form a conceptual bridge to the Model B_1 studies where the possibility of contextual effects on principal leadership practices and school outcomes is explored, using more robust theoretical models and more powerful statistical methods.

Second, the Models A and A_1 studies reveal a clear trend of mixed results concerning the effects of principal leadership on student achievement. Even when researchers have included control variables in the analysis, the findings are ambiguous. However, this finding must be interpreted in light of the relatively weak methods commonly used to assess the relationship. For example, as indicated in Table 1, our reanalyses of two Model A studies using Model B frameworks produced a variety of additional leadership effects (for more detail, see Hallinger & Heck, in press).

In our judgment, well-designed studies must use theoretical models that allow for the likelihood that the relationship between principal actions and school outcomes is indirect rather than direct. Although it is theoretically possible that principals do exert some direct effect on students' learning, the linkage between principal leadership and student learning (as measured by school outcomes) is inextricably tied to the actions of others in the school.

Models A and A_1 studies ignore the possible effects of these intervening variables. It appears, therefore, that the detection of direct effects of principal leadership on student achievement is difficult to assess in any valid fashion using these research designs. As noted, even when researchers do find positive effects, the implications remain unclear for both theory and practice.

Model B: Mediated effects without antecedent variables. Robust conceptualizations of principal leadership suggest that the effects of principal leadership will occur indirectly through the principal's efforts to influence those who come into more frequent direct contact with students (Boyan, 1988; Pitner, 1988; see Model B in Figure 1). Grounded conceptualizations of the principal's effects on student learning center on the leader's role in shaping the school's instructional climate and instructional organization (Bossert et al., 1982). Hypothesized effects occur both through the principal's personal actions (e.g., high visibility, instructional supervision, modeling of expectations) as well as by shaping school goals, policies, and norms (Duke & Canady, 1991; Dwyer, 1986; Goldring, 1990; Hallinger & Murphy, 1985).

As noted above, mediated-effects studies may or may not incorporate additional control variables that allow the principal's leadership to be viewed as a dependent and independent variable. In Model B studies, neither antecedent variables, such as personal characteristics of the principal, nor features of the school context, such as geographic locale (urban/rural), school size, or level, are included in the hypothesized model. Leadership, therefore, is viewed solely as an independent variable in the model. Principals are hypothesized to shape a variety of in-school processes that subsequently affect school outcomes.

Five of the studies reviewed used a mediated-effects conceptualization without exploring the possible effects of antecedents of principal leadership. Four of these incorporated control variables, either student SES or prior achievement into their analyses. However, as in the Model A research, the use of the variables was limited to controlling for exogenous effects on student learning (see Table 1). None of these researchers examined the effects of the control variables as a source of influence on the principal's leadership behavior.

The trend in substantive findings among the Model B studies was more positive, though still mixed. In a study of elementary and secondary schools, Crawford and colleagues (1985) reported weak positive effects of principal leadership on math achievement, but only at the elementary level. At the middle- and high-school levels, the finding of statistically significant effects was not replicated on any dimension of principal leadership for either reading or math. Jackson (1982) reported weak but positive effects of principal task and academic orientation on student learning, again at the elementary-school level. Eberts and Stone (1988) also report small but positive direct and indirect effects of principal leadership on school-level variables as well as on student achievement.

The most recent study among this group (Silins, 1994) demonstrates the usefulness of comparing theoretical models as well as different conceptions of leadership within the analysis. Silins questioned whether transactional and transformational leadership were best considered as separate or integrated theoretical constructs. Two theoretical models were proposed and tested through separate analytic techniques (path analysis and canonical correlation). Results of the path analyses suggested that transactional and transformational leadership are integrated in terms of their effects on school-improvement outcomes. Transformational leadership's effects on students were found to be indirect (i.e., through transactional leadership).

The comparison of theories of leadership through two analytical techniques represents an interesting contribution to the role that analytical methods can play in illuminating theoretical relationships. In the model using canonical analysis, transactional and transformational were forced to be orthogonal and therefore independent. Here the model was seen to fit the data less satisfactorily. One could also argue that using different analytical tech-

niques to investigate different models introduces some new possible sources of bias into the findings.

Despite this problem, the study demonstrates the superiority of path-analytic techniques (i.e., partial least squares regression) over correlational methods (i.e., canonical analysis) in testing for mediated effects in complex theoretical models. The former allows for more flexible comparisons between leadership and multiple outcomes. It is able to account for both direct and indirect effects within the same model. In contrast, canonical analysis is limited to testing for relationships between two sets of variables at a time, a less appropriate form of statistical test given the theoretical assumptions of Model B_1.

From the models discussed so far, two trends have emerged. Model A_1 studies hinted at the possibility of antecedent effects on principal leadership. The Model B studies further suggest that principal leadership may indirectly affect school outcomes. The glimmerings of positive indirect effects of principal leadership that emerge from these studies reflect the stronger conceptual underpinnings of the research as well as more advanced analytical methods. For the most part, however, the empirical evidence concerning these conclusions was arrived at through separate analyses of interrelated sets of data (i.e., environmental effects on leadership, leadership effects on outcomes). It remained to put these separate data together into one theoretical model and then to use appropriate analytic methods to test the preliminary conclusions. This is what occurs in the studies classified under Model B_1.

Model B_1: Mediated effects with antecedent variables. It is encouraging to note that calls for studies grounded in more comprehensive conceptual models appear to have been heeded by those conducting investigations in this subfield of study in educational administration (Boyan, 1988; Bridges, 1982; Murphy, 1988; Pitner, 1988; Wimpelberg, Teddlie, & Stringfield, 1989). Fifteen[2] of the studies included in the review—more than one third of the total—used a Model B_1 design. This group tended to build on the most robust conceptualizations and also the most sophisticated research designs. The fact that this group was both the largest and comprised of many of the most recent research reports is encouraging. It suggests that research in this domain may be beginning to show an accumulation of efforts.

Model B_1 studies generally approached investigation of the principal's role in school effectiveness comprehensively with regard for interactions across multiple levels of the school organization (e.g., Heck et al., 1990; Leithwood et al., 1993; Leithwood, 1994; Leitner, 1994). In addition, the researchers were considerably more explicit concerning the theoretical rationale for selection of variables. The *black box* that dominated in the Models A and A_1 studies was cracked open a bit in the Model B research. Here it was further illuminated.

As noted earlier, Bridges' 1982 review was highly critical of the analytical methods used by researchers into administrator effects during the 1970s. The analytical techniques used in the Model B_1 studies (see Table 1) are more appropriate to the task of determining the effects of principal leadership, if effects are to be found. As summarized in Table 1, researchers who adopted a Model B_1 conceptualization used a range of quite sophisticated analytic techniques, varying their techniques to the nature of the data collected and the research design. These methods included (a) multiple regression, (b) structural equation modeling, (c) multivariate analysis of variance and variance decomposition, and (d) discriminant analysis (i.e., sometimes used like a regression with categorical dependent variables). Despite the range of analytic techniques, the researchers all had a similar goal: to unravel the complex theoretical relationship between organizational context, principal leadership, in-school processes, and student outcomes.

The findings from these studies, though not uniform, are less equivocal than those from the prior groups. In fact, the trend of the findings among the Model B_1 studies is striking. Significant findings of contextual effects on the principal are surprisingly consistent within the group, even though the antecedent variables studied vary widely. Thus the studies confirm the importance of viewing leadership within the organizational and environmental context. Moreover, 11 of the 15 studies that used a B_1 model reported some statistically significant effect of principal leadership on school processes and, at least indirectly, on school achievement.

That said, we must qualify the latter conclusion. The range of effect on school achievement varied across studies, and in no case was it large. Interpreting the positive findings is further complicated by the fact that the studies used varying conceptions of principal leadership (e.g., educational, instructional, transformational, transactional) within the same general theoretical framework of administrative effects. Moreover, few studies included a full range of environmental and school contextual indicators. There is also considerable variation in how in-school factors are conceptualized as well as in the types of outcomes considered as evidence of school performance. These range from test scores to more widely differing definitions of effectiveness including a variety of teacher-perceived outcomes.

Despite these differences, most of the studies do reach the conclusion that the effects of principal leadership are relatively stronger on in-school processes than on outcomes (e.g., Goldring & Pasternak, 1994; Hallinger et al.,

in press; Heck et al., 1990; Leithwood, 1994; Leithwood et al., 1993; Leitner, 1994). This supports the validity of this conceptual model in specifying the principal's role with respect to environment, school processes, and outcomes.

As we conclude (and the majority of other researchers adopting this approach concur), the research using Model B_1 has been guided by an evolving framework. Variants of this conceptualization have been proposed by Bossert and colleagues (1982), by Leithwood and Montgomery (1982), and by Hallinger and Murphy (1985). Each, however, hypothesizes administrative behavior as being influenced by internal processes (e.g., past experience, beliefs) and external factors including training, organizational features, and environmental variables. Leadership practices contribute to the outcomes that schools produce, but this is strongly mediated by other people and in-school processes (e.g., Leithwood, 1994).

The theoretical richness of many of the Model B_1 studies is commendable. In most cases, the authors do not stop at the point of answering the empirical question at issue: Do principals make a difference? They also seek to contribute toward understanding the theoretical relationships that bear on variables within their models. Armed with more fully explicated theoretical models and more appropriate statistical techniques, the results demonstrate a different order of research when compared with the principal-effects studies reviewed 15 years ago. We briefly note a few examples drawn from this set of studies.

For example, Leithwood and colleagues (1993) sought to illuminate theoretical issues concerning the nature of transformational and transactional leadership. The study bears similarities to the study of Silins (1994) discussed above. In carrying out their study, they explore the effects of these different leadership constructs on internal school processes as well as on student achievement. Like Silins (1994), they also assess the theoretical relationship between alternative constructs for viewing organizational leadership.

In two other studies, Goldring and Pasternak (1994) and Leitner (1994) focus on the nature of organizational linkages forged by principals as they aim toward improving student learning. Both studies are theoretically located in the sociological tradition of explaining how leaders coordinate the technical processes in organizations. Again, these studies address the empirical question concerning the effects of principal leadership on school outcomes, and simultaneously explore the theoretical nature of linkages that are used to attain these effects.

In a quite different vein, the Hallinger and Murphy (1986) study demonstrates how community socioeconomic status appears to influence the type of leadership the principal exercises in interaction with various school processes. This study is somewhat unique among the studies in this review

because of its predominantly qualitative nature in terms of data collection (e.g., surveys, observations of classrooms, interviews, collection of school documents) and analytic techniques (e.g., content analysis, triangulation of data sources). The published study is a subset of a larger study analyzing differences between relatively effective and ineffective elementary schools (Weil et al., 1984).

In the study reviewed, the data focus on effective elementary schools only (as measured by consistent high performance across grade and subject areas). The schools were then dichotomized by SES and differences in the schools' social contexts and leadership practices were identified. The results indicated that the school's socioeconomic status (one of several possible contextual factors) moderates in-school processes (e.g., patterns of organization, relative emphasis on basic skills), including the principal's exercise of instructional leadership (i.e., greater flexibility and autonomy were allowed teachers in higher SES schools). By focusing on the relationship between schools, their communities, and principal leadership, the study begins to raise concerns about how environmental variables affect school processes and principal leadership.

The attempts at theory building represented within this group of studies are notable. They reflect a dual concern for addressing an empirical question of practical importance in the context of a theoretical model. As such, in our view, such Model B_1 studies represent the current state-of-the-art research within this domain.

Model C: Reciprocal-effects studies. When Pitner reviewed the administrative effects literature in 1988, she found no studies that had used a reciprocal-effects model. Surprisingly, we also found no studies that were explicitly conceptualized using a reciprocal-effects model. Two studies tested for reciprocal effects, but even these are more properly conceived of as Model B_1 rather than Model C studies (Hallinger, in press; Heck et al., 1990). Despite the infrequency with which investigators have used this approach, we feel that it holds promise for future investigations of dynamic models of principal effects.

Such an approach would posit mediating processes and school outcomes as affecting principal leadership, as well as leadership affecting those same processes and outcomes. Principals enact leadership in the school through a stream of interactions over a period of time. In doing so, they seek to address certain salient features of the school (e.g., current and changing states of student outcomes or staff morale or commitment). Alternatively, they may initiate changes in the school's curriculum program or instructional practices. These may cause changes in the conditions of the school that subsequently

produce feedback that causes reciprocal effects in the originating variable (i.e., leadership). This is a reciprocal process.

For example, a principal might enter a low-performing school that has severe problems of discipline and order. In response, the principal might take highly directive measures to establish control. Once the school has achieved a level of stability, the principal may adopt a quite different way of thinking about both goals and actions for school development.

Three factors appear to have hindered researchers in testing for reciprocal effects: data requirements, analytical methods, and conceptual bias. To explore the presence of reciprocal effects, longitudinal data are preferred. We offer two examples to illustrate why longitudinal data enhance our ability to validly test reciprocal-effects models.

Glasman has engaged in a program of research on principal leadership, the sum of which suggests that the school's achievement context affects principal leadership. Glasman asserts that principals respond to the degree to which the school emphasizes achievement. Moreover, he suggests that principals can shape this context through their exercise of leadership. This relationship is implied in a number of his direct-effects studies (e.g., Glasman & Fuller, 1992). As suggested earlier, however, the nature of cross-sectional research designs limits the conclusion that we can draw from these types of data. Thus, whereas the theoretical and empirical contributions of this work point toward this relationship, they cannot confirm it. This calls for longitudinal data.

Similarly, whereas principal leadership can be hypothesized to shape the school's culture (e.g., by promoting collaboration), it is also theoretically sound to suggest that principal leadership is simultaneously shaped by features of the school's culture (e.g., teacher resistance to change). Reciprocal relationships among variables such as these can be implied at one point in time by cross-sectional data, but this is only a partial representation of the relationship. A more accurate empirical representation of the dynamic relationships among these variables, however, would require them to be observed over time rather than at a single point.

Data collected at one point in the change cycle could give an impression of the type of leadership that has an impact. Yet it may be that this type of leadership worked only at a certain point in time. Cross-sectional studies cannot capture the dynamic relationships that may exist among variables.

Where doubts about the direction of causality are expressed, cross-sectional data are unable to resolve the ambiguity inherent in correlations and other measures of association (Davies, 1994). As Davies argued, "the duration in current state" data often collected in cross-sectional studies are not sufficient to overcome this type of problem. Moreover, with cross-sectional data one cannot characterize the inertial properties of the assumed reciprocal relationship. A more complete representation, therefore, would require the assumption that the reciprocal effects will only become apparent over time. Thus to specify such models properly longitudinal data are preferred. Common approaches to this problem are to pool cross-sectional data or to use time series (panel) data. Unfortunately, both types of longitudinal data on principal effects appear to be in short supply.

The second factor that has inhibited the testing of reciprocal-effects models concerns methods of data analysis. At the time of Bridges' review in 1982, multiple-regression analysis represented the state-of-the-art in terms of analytical techniques for exploring leadership effects. Although Bridges (1982) reported that the use of regression analysis by researchers in educational administration was rather limited during the 1970s, this analytic technique became increasingly popular during the 1980s. This trend is apparent among studies that explore antecedent effects and mediated effects (see Models A_1, B, B_1 in Table 1). Although researchers became more comfortable with the use of multiple regression during the 1980s, the limitations of this technique are such that it cannot be used to analyze reciprocal effects. Although some researchers have used interaction terms generated by multiple-regression models to imply reciprocity among independent variables, this does not represent a complete test and should be avoided in favor of more appropriate methods.

More complex theoretical conceptualizations require the use of what Tatsuoka and Silver (1988) termed causal inference techniques. The growing popularity of these techniques is due to their flexibility in handling a wider variety of theoretical models. These include direct, indirect, and total effects, as well as reciprocal (nonrecursive) and hierarchical relationships.

A wide variety of terms is used to describe these causal inference techniques. Path analysis has been used to refer to models where single (observed) indicators are used to represent the variables in the theoretical model. Covariance structure models, latent variable models, and structural equation models (SEM) are all terms that refer to models that have observed underlying (latent) variables. They are erroneously referred to by the computer programs used to analyze the data (e.g., LISREL, EQS). These analytical methods provide a more appropriate set of techniques for conducting reciprocal- effects studies (see Hallinger & Heck, in press). They should be used in place of multiple regression for testing reciprocal-effects models.

Finally, in the past what we might term conceptual bias has subtly shifted the attention of researchers away from reciprocal-effects conceptualizations. Discourse in educational leadership has traditionally emphasized conceptualizations of leadership as the independent variable (Bridges, 1970, 1982). Even when contingency models have been proposed, static rather than

dynamic models tend to be used in empirical tests. This is demonstrated in the antecedent-effects and mediated-effects studies, and studies where data are collected over time.

Thus even when longitudinal data and analytical methods have been available, researchers have tended not to use them in reciprocal-effects models. Ironically, our own research illustrates this point. Both Hallinger et al. (in press) and Heck et al. (1990) reported testing for reciprocal effects during the earlier stages of their studies. However, in neither case did their theoretical models propose reciprocal relationships prior to analysis of the data. Even after the fact, the authors did not seek to explore the full set of possible reciprocal effects within their models. This again demonstrates the importance of theoretical groundwork to subsequent analysis.

Despite these limitations, these studies offer insight into how one might explore reciprocal effects. In both cases, the authors proposed comprehensive models (B_1) that included antecedents, leadership, intervening variables, and students outcomes. It would have been possible to reframe these as reciprocal-effects models. Even so, however, the results would have been limited by the cross-sectional data.

With additional data, the authors would have explored how the achievement levels of the school influence the climate of the school over time rather than assuming that learning climate operates in a unidirectional fashion on student learning. They might also have used the same set of variables to explore how principal leadership responds to changes in school climate and student achievement over time. Each of the above represents a reasonable hypothesis in light of contingency theory and prior empirical research (e.g., Andrews & Soder, 1987; Hallinger & Murphy, 1986; Rowan & Denk, 1984).

Given the theoretical importance of the issues that flow from viewing principal leadership effects as reciprocal rather than unidirectional, we see this as a prime target for future study (also see Bridges, 1982; Rowan et al., 1982). We believe that Models B_1 and C hold particular promise in the next generation of principal-effects studies. We elaborate on this point in the concluding section of the article.

CONCLUSION

At the outset, we identified discrepant conclusions drawn from several reviews of research on the role of educational administrators published in the early 1980s. Bridges' (1982) review, focusing on methodological issues in research on educational administration, was highly critical of the state-of-the-art as it had evolved up to 1980. He was adamant in his assertion that little progress had been made toward addressing important problems of theory or practice since an earlier review conducted by Erickson in 1967. Theoretically oriented syntheses of the literature conducted by other scholars focused somewhat more on conceptual and substantive trends in the literature (Bossert et al., 1982; Leithwood & Montgomery, 1982; Murphy et al., 1983; Sirois & Villanova, 1982). Their conclusions were distinctly more optimistic, particularly concerning prospects for understanding the role of the school administrator in school effectiveness.

Drawing on these reviews, as well as later on a theoretical framework proposed by Pitner (1988), we focused our lens on one subset of the educational administration literature: studies of the principal's role in school effectiveness. The priority of this report was weighted heavily toward analyzing the conceptual features encompassed within quantitative research conducted between 1980 and 1995. Our analysis was only secondarily concerned with an analysis of the methodological and substantive trends in this research.

In this concluding section, we summarize the major findings and consider the conceptual and methodological implications. We also discuss the substantive results in relation to the question driving the review: "Do principals make a difference?" We finally note those features that assume greatest salience for those who will conduct the next generation of research in this domain.

Conceptual Progress

As a group, the studies demonstrate conceptual advances over the prior generation of principal-effects research. Whereas Bridges noted an absence of theoretically oriented studies, we found a different trend. Using a loose definition of theoretical orientation, virtually all of the studies could be classified as *theoretically informed*. Within the theoretical models tested, the researchers were generally careful to define their variable constructs and to offer a rationale for the choice of variables.

Using a more strict definition of theory, we viewed approximately one third of the studies as quite sophisticated in theoretical orientation. Particularly within Models B and B_1, researchers took pains to discuss in advance how the leadership construct was theoretically linked to the intervening variables and student outcomes (e.g., Bamburg & Andrews, 1990; Scott & Teddlie, 1987). Many of the Model B_1 studies linked their empirical efforts to broader theoretical frameworks (e.g., Goldring & Pasternak, 1994; Heck et al., 1990; Leithwood 1994; Leitner, 1994; Silins, 1994). This advance in

theoretical groundwork was critical in light of the nonexperimental research designs that predominate in this domain.

The review reinforces the importance of beginning with theoretically informed models of leadership and how it influences school performance. If the impact of principal leadership is achieved through indirect means (e.g., school climate, school culture, instructional organization), we must advance our understanding of how such linkages are shaped by the principal. The studies offer useful guidance as to the types of intervening variables that may potentially yield fruit (e.g., Leitner, 1994). The development of theoretical models made it possible for the authors to begin to untangle complex relationships among interrelated variables in these studies of principal effects.

Future research may build on this conceptual progress in three ways. First, both conceptual and methodological progress in the field make the study of comprehensive models of the principal's role in school effectiveness (e.g., Models B_1, C) increasingly feasible. In fact, findings from this review lead to the conclusion that Model A and A_1 studies, which by definition neglect the influence of intervening variables, are harder to defend as modes of research in this domain. These models served a useful purpose during an earlier period. Today, however, we conclude that they simply lack the power to shed further light on the nature of the principal's role in school effectiveness.

The greatest progress in this field will yield from research that places the principal in the context of the school and its environment. This has both theoretical and methodological implications. As we tried to demonstrate, designs that explore the effects of environment and principal leadership separately are inherently limited (see also Hallinger & Heck, in press). Such research should explore simultaneously the role of the principal as an independent and a dependent variable. The theoretical groundwork has been laid for such studies, and analytical methods appropriate to studying this type of comprehensive framework (e.g., structural modeling) are available for use in this domain (see Heck et al., 1990; Leithwood, 1994; Leithwood et al., 1993, Scott & Teddlie, 1987). Their use should become more common practice in future research on leadership effects.

We believe that researchers of administrative effects will also profit greatly from adopting a multilevel perspective toward schools as organizations (Bossert et al., 1982; Rowan et al., 1991). Treating data within its hierarchical structure may assist in building theory about the nature of administrator effects across levels of the organization. It will also facilitate more refined investigations into a wider variety of theoretical perspectives on how impact is obtained in different types of organizational structure (e.g., restructured schools).

However, the use of these tools is double-edged. It is important to keep in mind that strong theoretical explication must be used to guide the specification of models when applying these techniques or it becomes very easy to fall into the trap of drawing incorrect or overstated findings. When using these tests, the failure to reject one model is not an indication that no other models could fit the data equally well or better. Thus it is wise to consider competing structural models in light of theoretical propositions and previous empirical work (see Leithwood et al., 1993, and Silins, 1994, for good examples).

Despite the substantial progress made during the past 15 years in developing and testing increasingly comprehensive models of principal effects, additional conceptual work remains to be done. As a field, we have moved away from viewing principal leadership solely as an independent variable (Models A, B) to the design of empirical studies that simultaneously conceptualize leadership as both an independent and dependent variable (Models A_1, B_1, C). This is not a theoretical breakthrough when considered in light of theory in the field. However, it does represent a paradigm shift in the conceptualization of educational leadership as it has been used in empirical research on principal effects.

We believe that another paradigm shift ought to characterize the next generation of principal-effects studies. This is represented by Model C designs, which assume the presence of reciprocal effects. We hope that our admittedly limited attempt to explicate a reciprocal-effects model suggests the potential value of conceptualizing the principal's role in school effectiveness as an interactive, adaptive process. Given current theoretical constructs and statistical methods, Model C research is eminently possible. The major impediment is the availability of longitudinal data. Thus Models B_1 and C represent worthwhile targets for future research in this field.

Finally, we recognize that research is a resource-dependent enterprise. Researchers must make decisions as to how much data of what types to collect and analyze when planning their studies. This is even more salient for doctoral students who do much of the research in our field. In some cases, they may lack the resources needed for testing of comprehensive models.

Previously, in this situation, researchers have either studied smaller samples of schools or reduced the number of variables. Smaller samples become problematic when seeking to determine effects on student achievement. As noted above, the reduction of variables—for example, to principal leadership and student achievement (i.e., Model A)—has similarly negative consequences on the capacity of the research to make a meaningful contribution.

Thus we suggest that when limited resources are available for researchers working in this domain, they should forego the focus on school achievement as the outcome. Instead, they should focus on linkages within other parts of the larger model of exogenous variables, principal leadership, and intervening school-level variables. In particular, researchers should focus greater

attention on uncovering the relationship between principal leadership and those mediating variables that we now believe influence student achievement. School mission, teacher expectations, school culture, and facets of the school's instructional organization are among the intervening alterable variables identified in these studies. We believe that this approach to the resource trade-off will yield more benefits to the field than additional Model A and Model A_1 studies.

Methodological Progress

Progress on the methodological front parallels conceptual advances in this literature. The studies that we reviewed demonstrate an increasingly sophisticated use of theory to guide the study of the principal's role in school effectiveness. This theoretical orientation carried over to the methodological domain by causing researchers to seek out techniques that could match the requirements of their theoretical models. This was reflected in a general trend toward greater sophistication in data-analysis techniques as we moved from 1980 to 1995. Even among the least sophisticated studies (i.e., Model A), we found an increased use of control variables, the paucity of which had been noted in Bridges' (1982) review. The more recent efforts to test comprehensive models of principal effects use more powerful variants of structural modeling.

At the same time, the current crop of studies of administrator effects continues to be limited by the persisting reliance on cross-sectional designs. Cross-sectional designs—even ones of high quality—limit our ability to understand the causal relationships involved in studying the impact of school administrators. Interpretation of data from correlational studies of principal effects is still hindered by the absence of longitudinal research, both quantitative and qualitative.

With respect to qualitative studies, several were uncovered in our initial search, though fewer than we expected that were conceptualized as principal-effects studies. Within the broad qualitative domain, we would argue for more mixed-method and two-stage studies. In the latter approach, the researcher engages the basic question of administrator-effects issues at a broad level of study through quantitative analysis and then focuses on specific issues through more flexible, qualitative methods (e.g., Hallinger & Murphy, 1986b; Jackson, 1982; Leitner, 1994). We see this as a potentially fruitful means of uncovering the more subtle processes that underlie expertise in leadership behavior (e.g., Dwyer, 1986; Leithwood et al., 1992).

Although the article did not focus on instrumentation, we found clear progress on two fronts. First, researchers in this domain evidenced increased concern and care in assessing and describing the characteristics of their measurement instruments. Most of these studies included discussion of instrument reliability. Second, it appears that several instruments have emerged over the past decade with a reasonable track record for use in studies of school administrators. These cover several constructs, including instructional leadership (Hallinger & Murphy, 1985; Villanova et al., 1981), transformational leadership (Leithwood et al., 1993; Silins, 1994), and perspectives on leadership derived from the work of Bolman and Deal (1992) and Sergiovanni (see Cheng, 1994).

The reliability of measurement scales seems to be less of an issue today than a dozen years ago. Yet we remain concerned over the tendency of researchers to avoid assessing the validity of their measurement instruments (Hallinger & Heck, in press). This is particularly important when using instruments developed at the elementary-school level in high schools (Jones, 1987) or across cultural contexts. Researchers should exercise a similar attention to validity that has become more commonplace with respect to reliability in the development and use of instruments.

Do Principals *Make a Difference*?

Despite the optimistic perspective assumed by many writers in the field of principal effectiveness, closer inspection of individual studies has generally disclosed a need for considerable caution (Miskel, 1982; Rowan et al., 1982; van de Grift, 1990). This review of theoretical and related empirical models used to study the role of principal leadership in school effectiveness yields a somewhat unexpected finding.

When the studies were grouped in terms of underlying theoretical models, patterns emerged that indicate that model type makes a difference in what is found. With but a few exceptions, the effects of principal leadership among Model A and Model A_1 studies (e.g., bivariate designs with or without controls) were nonexistent, weak, conflicting, or suspect in terms of validity. The studies categorized under Models B and B_1 used increasingly sophisticated theoretical models, stronger research designs, and more powerful statistical methods. These studies yielded more frequent instances of positive findings concerning the role of the principal in school effectiveness. In fact, this was somewhat unexpected given the more rigorous methods inherent in these studies.

These studies support the notion that principal leadership can make a difference in student learning. What these studies further indicate, however, is that we must attend to the conditions under which this effect is achieved. Context, particularly facets of the school's socioeconomic environment,

appears to influence the type of leadership that principals exercise. Unfortunately, the studies remain too disparate in their conceptualizations of leadership and context variables to specify the contingencies that come into play in this relationship.

At a more general level, however, the most theoretically and empirically robust models that have been used to study leadership effects (Models B, B_1) tell us that principal leadership that makes a difference is aimed toward influencing internal school processes that are directly linked to student learning. These internal processes range from school policies and norms (e.g., academic expectations, school mission, student opportunity to learn, instructional organization, academic learning time) to the practices of teachers. Studies based on a mediated-effects model frequently uncovered statistically significant indirect effects of principal leadership on student achievement via such variables.

Interestingly, when the studies that report positive findings are reviewed, only one mediating variable shows up with consistency as a significant factor interacting with principal leadership: school goals (e.g., Brewer, 1993; Bamburg & Andrews, 1990; Glasman & Fuller, 1992; Goldring & Pasternak, 1994; Hallinger et al., in press; Hallinger & Murphy, 1986; Heck et al., 1990; Leithwood, 1994; Silins, 1994). The fact that this variable was measured differently in various studies leaves the interpretation of this finding somewhat ambiguous.

In some studies, the goal variable was measured in terms of goal consensus. In others, it was operationalized in terms of the presence of school goals, the degree of academic focus, principal vision or focus, or the principal's role in communicating a mission. For the purposes of this article, we can do no more than note that this function of the principal—sustaining a schoolwide purpose focusing on student learning—does receive empirical support. Notably, the studies further reinforce the notion that the interaction between leadership and goal structure within the school is also influenced by environmental variables.

At this time, the specific nature of these complex interactions across sets of variables within a model of principal effectiveness remains unclear. However, the fact that such relationships are emerging from empirical analysis is of both practical and theoretical interest. For practical purposes, we can begin to imagine a day when prescriptions generated from research on leadership effects will do justice to the complexity of the principal's role. Of theoretical importance, the simultaneous modeling of leadership effects in conjunction with organizational goal structure and environmental context draws attention back to an important, though underexplored, line of inquiry in the organizational theory literature (e.g., see Simon, 1964; Thompson, 1968; Thompson & McEwen, 1958). In our judgment, bringing the leverage of this literature to bear on these relationships, while using both mediated-effects and reciprocal-effects models, represents a ripe challenge for future investigators.

How can we account for these results in light of the conflicting findings of the past? We believe that this can be traced to the accumulation of knowledge that has occurred during the past 15 years in both conceptual and methodological domains. What we termed Model B_1 studies most clearly demonstrate this progress. The finding of positive indirect effects of leadership derives from among the best studies conducted to date in this field. In the often ambiguous domain of social science research findings, this trend gives rise to cautious optimism.

The fact that leadership effects on school achievement appear to be indirect is neither cause for alarm nor dismay. As noted previously, achieving results through others is the essence of leadership. A finding that principal effects are mediated by other in-school variables does nothing whatsoever to diminish the principal's importance. Understanding the routes by which principals can improve school outcomes through working with others is itself a worthy goal for research. Most important with respect to this point, the research illustrates that these effects appear to compound as principals pursue school-level action.

The fact that the effects noted in these studies remain small is also of little concern. In the words of Ogawa and Hart (1985):

> [The study's] most important finding was that the principal variable accounted for between 2 and 8 percent of the variance in test scores. Although such figures may seem small, there are at least two reasons they should not be dismissed as unimportant . . . findings of research on school effectiveness suggest that even small proportions of variance are important. Jencks and his associates demonstrate that only about 15 percent of the total variance in student achievement is attributable to between school differences. Further, Rowan and his associates conclude that about 5 percent of the total variance in student achievement can be attributed to stable state-level properties. In light of these results, the discovery that 2-8 percent of variance in student performance is attributable to principals takes on a glow of relative importance. (p. 65)

Thus the review supports both the potency of Bridges' (1982) highly critical review of methodology in educational administration and the conceptual promise hinted at by others (Bossert et al., 1982; Leithwood & Montgomery, 1982; Murphy et al., 1983). Although some readers may be frustrated by the degree of attention we have given to substantive findings, these were of secondary importance in this review. For the purposes of scholarship, the more salient finding lies in the demonstration of how

substantive progress in a field can be achieved when headway occurs simultaneously on methodological and conceptual fronts. If, in the year 2007, methodological and conceptual advancements of a similar magnitude can be demonstrated, we are confident that the field will have made significant headway in addressing important substantive problems of interest to practitioners, policymakers, and researchers.

NOTES

1. Notably, two of the reviewers of this article emphasized the practical limitations of experimental research in this domain. Although this goes against conventional wisdom, it highlights the increased confidence that is being accorded to nonexperimental research as methods of data collection and analysis become more robust.

2. The total includes two reanalyses of data included in the original group of reports under review that were conducted by the authors.

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A Critical Perspective on Teacher Participation in Urban Schools

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Two discourses inform the discussion of teacher participation: one is administrative, the other participatory; the first is dominant, whereas the latter is incipient. This article applies a critical perspective to review the administrative discourse, surfacing issues it fails to address, and suggesting alternatives that lead us down the critical path. The administrative discourse draws from theories of human relations management, culture, and community building, obscuring hierarchies and power differences. In urban settings, the hierarchies that need to be addressed exist not only within the system and school, but between the school and the neighborhood. The alternative, participatory discourse must expand and deepen the concept and practice of democratic participation, addressing not only teachers but students, communities, and system change. Drawing insights from the literature on worker democracy, feminism, new movements, and critical educational theory, the article presents the main issues that need to be addressed to apply teacher participation to urban educational reform. These include extending the scope of participation, creating new structures, building supports and networks, and promoting democratic communities across diversity.

Much of the current, second wave of educational reform has been couched in the language of teacher participation and empowerment. At the national and state levels, policymakers and advocates have called for the development of collegial, professional models for teachers' work and greater involvement of teachers in decisions that affect their work (Carnegie Foundation for the Advancement of Teaching, Task Force on Teaching as a Profession 1986, 1988; National Governors' Association, 1986; NEA & NASSP, 1986;

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