
The Multilevel Effect of Administration on Technical Output in Public Schools: A Cross-National Study of Managerial Behavior and Individual Performance

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Abstract

This cross-national analysis considers the influence of administrative performance accountability on technical output in public schools through the implementation of rigorous standards and administrative centralization. As a public and compulsory social institution in most nations, schools are among the most permeable public organizations in the world. This study suggests that school administrators follow legitimate models of managerial behavior, but that managerial behavior varies between and within school systems with different levels of administrative centralization. Using a three-level multivariate regression, this study finds evidence that variation in school administrators' managerial behaviors has little consistent or significant influence on variation in the technical output of the organization. The evidence also suggests that models determined by degree of administrative centralization at the national system level add little to the influence of school administrators' managerial behavior on the technical output of school organizations..

The Problem of School Management and Performance

Relatively recent reform and policy initiatives in the United States have renewed calls for both performance accountability and more rigorous standards in one of the nation's largest public institutions: the public schools (*Commission on Excellence in Education, 1983; Secretary's Commission on Achieving Necessary Skills, 1991; U.S. Department of Education, 2002*). In addition, consistent comparisons of school performance in the US with those in other nations suggest that the effect of administration on the technical output of publicly-permeable organizations such as schools is largely misunderstood. These calls for accountability and international comparison also assume that the unique environment of these organizations does not influence either the managerial behavior of school administrators or the performance of individual students within these organizations.

The problem presented here is that public school administrators are often evaluated on the performance of the people they ostensibly serve, namely the students. As

a result, a research focus on the relationship between school administrators' managerial behavior and student performance is necessary to either validate or invalidate popular calls for multilevel performance accountability. Because school administrators are often organizationally removed from the individual and technical outcomes of schooling (namely, student performance), some argue that it is inappropriate for school administrators to be held directly accountable for the performance of students. Yet this accountability continues a long-standing appreciation for the corporate structure and system of top-down management with its accompanying accountability structure that is so often revered among school administrators (*Tyack, 1974*).

In an effort to lessen or eliminate performance disparities in the United States, in particular, some have also called for more rigorous standards for both administrators and those they manage. One way of implementing more rigorous performance standards is standardization of management and administration. Standardization is often interpreted to mean consistency, rigor, and appropriateness of the organizations' services. But standardization may also refer to the level of administrative or managerial centralization, because as standards become more consistent, they also tend to become increasingly centralized.

These international comparisons result from the underlying belief in the United States that the nation-state encourages and directs the growth of public schooling as a tool for creating productivity and citizenship (*Fuller & Rubinson, 1992, p. 11*). Therefore, the most important institutional influences on schools as organizations should reside at the national level. In other words, organization-level influences are nested within the nationally institutionalized environments of the organization. One measure of national environmental effects is administrative control or governance, which has been shown to have significant effects on the workings of publicly-permeable organizations like schools (*Stevenson & Baker, 1991*). For instance, in administratively decentralized national systems the organizational effects on schools may be more localized, whereas in administratively centralized national systems there is much penetration from the national government and other national level institutions into organizations at the regional and local levels. In order to uncover these important contextual effects at the national level, this study uses comparative, cross-national data and multilevel regression modeling to determine both within and between system effects.

Calls for performance accountability and administrative centralization give rise to important multilevel questions: (1) To what extent, if any, is variation in technical output associated with variation in administrators' managerial or administrative behaviors in publicly-permeable organizations? and (2) Does administrative centralization act as an intervening influence in this relationship by affecting the amount of influence that administrators have over the methods and means leading to the technical output of their organization?

Conventional Theories of School Management and Performance

Behaviors of school administrators are often discussed in relation to their influence on the further behaviors or performance of their administrative subordinates (*Hallinger & Heck, 1996; Hallinger & Heck, 1998; Heck, 1996; Heck, Larsen & Marcoulides, 1990; Leitner, 1994; Murphy, 1988; Murphy, 1990; Ogawa & Hart, 1985; Pounder, Ogawa, & Adams, 1995*). Because of the various avenues and influences administration may embody, connections between school administrators and the objects of their managerial behavior are

both direct (straightforward from one level to the next) and indirect (filtered or enhanced either across or through levels).

Both policymakers and public stakeholders alike often assume school administrators' influence on student performance. Much of the literature connecting school administrators, managerial behavior and student performance assumes a tight linkage between organizational administration and technical output. For example, some studies suggest that how school principals manage schools directly affects their implementation of key processes within their work structure, which then indirectly influences a schools' climate and organization hierarchy and, ultimately, student performance (*Heck, Larsen, and Marcoulides, 1990, p. 99-100*). As public schooling becomes and remains the predominant formal mechanism through which citizens are formed, socialized, and prepared for roles in the political, cultural, and economic arenas of adult life, the administration of schools becomes increasingly essential to the social life of families, nations, and the global community. Consequently, the pressure on school administrators like principals to influence and, hopefully, raise the performance levels of students is significant.

Although schools are large public organizations from both a scope of influence and public participation perspective, theoretically-based research on school management and administration, when found, is not necessarily organizationally explicit (*Ogawa and Bossert, 1995, p. 233*). Although school administrators' roles and managerial behaviors are often prominently figured in discussions of performance accountability, few studies explore alternative organizational perspectives concerning the relationship between school administration and organizational output such as student performance.

If, however, school administration is discussed in relation to its organizational characteristics, the technical-functional perspective is emphasized, which depicts "organizations as technically rational systems...[emphasizing] two organizational features: goals and formal structure" (*Ogawa and Bossert, 1995, p. 227*). According to this perspective the goal of school administrators is the end product of the organizational process: high levels of technical output measured as student performance. From this perspective, school administrators are in positions of authority to affect and mold the formal structure of their schools in order to facilitate and encourage high student performance.

It is worth noting that although external forces may influence school administrators' managerial behaviors, the behaviors themselves focus on internal management of school processes, resources, and relationships. Using these characteristics of school administrators' managerial behaviors, the reform and policy argument for administrative accountability for individual level performance finds justification. Standardization of organizational procedures through centralization further emphasizes the influence that each of these categorical elements of school administrators' managerial behavior should have. By reducing the variability of organizational process through centralization, variability in school administrators' managerial behavior and influence on student performance should also be reduced, freeing them to engage in non-performance-related behaviors and activities.

Institutional Perspectives on School Management and Performance

The persistence of archetypal school management behaviors and models in spite of significant variation in individual performance levels contradicts technical-functional arguments (*for examples and further citations see Hallinger & Heck, 1996*). Among the many kinds of school organizational environments that exist, there are often pressures on

school administrators to behave in similar ways and perform duties leading to similar outcomes. A neo-institutional perspective of school administration accounts for this similarity by suggesting that school administrators follow rationalized scripts designed to ensure organizational legitimacy and survival. This means that the managerial behaviors of school administrators are more related to rationalized models of legitimate organizational structures and processes than to specific outcomes, including individual-level performance.

From a neo-institutional perspective school administrative behavior is an organizational quality and as such (1) enhances an organization's social legitimacy and chances for survival, (2) finds strength in a network of roles throughout the institution, (3) relies on individuals' resources, and (4) leads to the adoption of structures that mirror an organization's cultural environment (*Meyer & Rowan, 1977; Ogawa and Bossert, 1995*). By situating school administrators in the midst of complex organizations, this perspective questions the assumed linkage between school administrators' managerial behavior and individual student performance. Instead, a neo-institutional perspective suggests that school administrators follow legitimate models of managerial behavior that determine the amount of variation in their behavior occurring between and within local organizations and national systems characterized by different levels of administrative centralization.

Expectations and Hypotheses

To summarize, a technical-functional perspective predicts an association between variation in school administrators' managerial behaviors and variation in individual student performance. By contrast, organizational and institutional perspectives suggest that individual level influences may result from technical-functional forces and reasoning, but the actual products of this reasoning may defy technical-functional outcome predictions. For example, when student performance rises, it may not necessarily be because school administrators' managerial behaviors changed or precipitated the change. Organizational managers such as school administrators may influence organizational level change without any accompanying change in outcome at the individual level. The first hypothesis tests these contrasting perspectives.

Hypothesis 1: Overall variation in school administrators' managerial behaviors associates with variation in individual student performance.

School administrators may not be accountable for individual level outcomes because these outcomes are predicted by organizational elements to which school administrators may contribute, but which are not dependent upon or significantly related to their managerial behavior. Instead, school level decisions and changes follow legitimate, rationalized models in part to ensure the survival and legitimacy of the organization in spite of rather than because of individual level outcomes such as student performance. It may be more appropriate to look at organizational level characteristics that correspond with individual level outcomes independent of school administrators' managerial behaviors than to use these organization level behaviors to predict individual level outcomes. This means that school administrators' individual resources and decision-making authority are not as significant to individual student performance as the institutionalized model or environmental context in which their managerial behaviors exist and to which they conform.

Consequently, the school environment or type of educational system in which

individual students and school administrators work may be more predictive of individual-level student performance and organizational-level school administration characteristics than any causal link between school administrators' managerial behaviors and individual student performance. Organizations become structured by their environments and isomorphically change with them (*DiMaggio & Powell, 1983; Meyer and Rowan, 1977*). Of particular interest to school administrators is the probability that structure and substance, which insinuates itself among school organizations, disseminates through their managerial behaviors and activities. Rather than any sort of technical exchange between school administrators and individual students via the school administrators' managerial behaviors and the consequences of their behavior, school administrators reflect organizational models applied to and shaped by environmental contexts.

Another perspective introduced above is that rational and contextually legitimate models of schools' organizational structure, processes, and outcomes drive school administrators' managerial behaviors. Legitimate managerial behaviors depend on the institutional model incorporated into each school system. Variation in school administrators' managerial behaviors should therefore differ depending on the type of organizational environment in which they operate. Variation in managerial behavior that is contextualized to specific organizational conditions and contexts should also be more influential than managerial behaviors that follow a strictly standardized model, which limits school administrators' decision-making authority.

Hypothesis 2a: Variation in school administrators' managerial behaviors reflects their degree of independent decision-making authority and depends on the level of administrative centralization;

Hypothesis 2b: Consequently, variation in school administrators' managerial behavior influences individual student performance more in administratively decentralized than in centralized systems.

Regardless of the significance of school administrators' managerial behavioral influence on individual student performance, the level of administrative centralization should determine school administrators' ability to contextualize management within their schools. The same institutional influences that contribute to the training, education, and managerial behavior of school administrators as rationalized and legitimate models of organizational management are products of the environment and preexisting levels of student performance at least as much as they are causes of it. School administrators in decentralized systems can direct their managerial behaviors more specifically to the contexts and situations of their school and students, leading to more appropriate resources and opportunities as well as higher individual student performance.

Problems of Scope and Comparativeness

As with many other social scientific arenas, a preponderance of the administration and management literature and research focuses on a single national system's situations and concerns, specifically, and other national systems less frequently. Consequently, the literature and research on school administration in general and their managerial behavior in particular is limited in scope and generalizability across national systems.

With a frequent emphasis on the effects of globalization, researchers have begun

emphasizing the benefits of international comparison more often. Epstein (1994, p. 918) argues that comparativists explain “why [national] systems and processes vary and how education relates to wider social factors and forces.” An internationally comparative perspective allows researchers to explain phenomena not only within school systems and institutions, but also phenomena that link schooling to its unique organizational environment within national systems (Noah & Eckstein, 1969, p. 113; Theisen & Adams, 1990). Internationally comparative perspectives are important because they encourage school administrators and policymakers to understand and consider the role of historical, social, cultural, political, and economic influences on schools’ organizational development (Paige & Mestenhauser, 1999).

Public schooling is a global phenomenon and as such the managerial behavior of school administrators has the potential to influence student performance in every nation’s system. Although national system-specific analyses exist (Dimmock & Walker, 1998; Fenech, 1994; Hallinger, Taraseina, & Miller, 1994; Heck, 1993; Paige & Mestenhauser, 1999), cross-national analysis of school administrators’ influence on individual student performance through their managerial behavior is rare. Because this analysis considers individual level performance and organization level managerial behavior in different national contexts, it adopts a cross-system approach (Bray & Thomas, 1995). This sort of analysis also affords the opportunity to adequately consider school administrators’ managerial behavior in its broader sociological and political context of administrative centralization.

Data, Measures, and Models

The data for the analyses come from the Third International Mathematics and Science Study (TIMSS). Administered between 1994 and 1995 under the auspices of the International Association for the Evaluation of Educational Achievement (IEA), TIMSS represents an international sample of individual students, classroom teachers, and school administrators from more than 40 different national school systems. The TIMSS sample includes nations from most of the world’s geographic regions as well as nations with both developing and developed economies (*see IEA 1997 for a complete list of TIMSS countries*).

In each country a multi-stage sampling design was used to select a nationally representative sample of math classrooms (*see IEA 1997, Chapter 3 for details*). *The individual students of these classrooms and their school principals make up my sample*. TIMSS administered math achievement tests to all students in the selected classrooms. Students also completed surveys that included questions about their families, teachers, schools, and after-school activities. School principals completed questionnaires about their work schedule, their involvement in school and professional activities, and general school characteristics. Both achievement tests and questionnaires were designed to be comparable across classrooms, schools, and countries.

Dependent Variable

To measure student performance, these analyses use the TIMSS math achievement test scores for individual students. The TIMSS achievement tests are based on IRT (Item Response Theory) scale scores, meaning that each student was not given all of the test questions, but only a few items within each content area of each subject. The TIMSS designers used the answers to these questions to create “plausible values” for the math

achievement score each student hypothetically would have received if given all of the possible test questions (*see IEA 1997, Chapter 5 for a detailed discussion of the TIMSS achievement tests*).

Independent Variables

The dimensions of school administrators' managerial behavior considered for analysis are the contributions of principals' human resources, organizational rationality and legitimacy, and the distribution of curricular (and consequently organizational) power versus authority. These managerial influences are operationalized by dividing school administrators' managerial behaviors into those focusing on internal management and those focusing on external legitimacy. This division allows measurement of both administrative centralization's influence on managerial behavior as well as school administrators' managerial influence on individual student performance. The two composite measures of school administrators' managerial behavior are based on responses from the TIMSS school principal questionnaire. The first measure consists of eight items from the principal survey and indicates the number of hours per month each principal typically spends on internal school activities. The second measure consists of an additional five items from the principal survey and indicates the number of hours per month principals typically spend on external school-related activities. The two measures of managerial behavior are moderately correlated across the entire sample ($r = .330, p < .001, n = 4550$).

The centralization variable used in the analysis was constructed from information found in *The International Encyclopedia of Education (1994)* concerning curricular governance in each of the appropriate national education systems. In constructing this measure the primary concern was determining the location of administrative decision-making authority within each nation's school system. Nations were rated on a scale of 1 to 5, with 1 indicating administrative decision-making authority at the national level, 3 indicating authority at the provincial level, and 5 indicating authority at the local level. The values of 2 and 4 were assigned to intermediate systems: national-provincial for the former and provincial-local for the latter. Thus an administratively-centralized national school system such as France's received a 1 on the centralization measure, and a decentralized nation like the U.S. scored a 5.

Control Variables

The analysis includes as controls three student-level variables which may act as covariates of individual student performance and school administrators' managerial behavior. These variables are the socioeconomic status of each individual student's family, each student's sex, and an indicator of whether or not each student speaks the language of the achievement test in his or her home. These three variables were taken directly from the TIMSS student survey. At the school-level additional control variables are included to measure each school's sex composition, mean student socioeconomic status, and mean score on the student language variable. At the nation-level, control variables are included for mean levels of managerial behavior across all school administrators within each national system of education. Table 1 presents summarized descriptive statistics for all of the variables included in the analysis.

TABLE 1
Summary Statistics for Variables Used in the Analysis

	Range	Mean	SD	N
<i>Individual-Level Variables</i>				
Math Performance	144.17-987.44	522.21	100.19	105277
Sex (1=female, 0=male)	0-1	.51	.50	105277
Language	1-3	1.21	.50	105277
Socioeconomic Status	1-5	3.38	1.26	105277
<i>Organization-Level Variables</i>				
Internal Activities	0-297	94.60	45.60	4550
External Activities	0-200	45.46	26.92	4550
Mean Sex	0-1	.50	.21	4550
Mean Language	1-3	1.19	.35	4550
Mean SES	1-5	3.38	.72	4550
<i>National System-Level Variables</i>				
Centralization	1-5	1.72	1.20	32
Mean Internal Activities	66.21-128.85	94.74	19.17	32
Mean External Activities	24.95-72.27	45.09	11.26	32

Models

First, descriptive analyses determine the influence of administrative centralization on school administrators' managerial behavior and then progress to multilevel regression modeling to determine the cross-national relationship between administrative centralization, school administrators' managerial behaviors, and individual student performance. The mean hours school administrators in administratively centralized and decentralized school systems reported engaging in certain managerial behaviors was first computed. Then school administrators' managerial behaviors were correlated with individual student performance and administrative centralization to determine the baseline relationship between these variables and the degree of variability that centralization might contribute to managerial behaviors.

Multilevel regression modeling was used to assess the cross-system relationship between school administrators' managerial behaviors and individual student performance. Multilevel regression modeling is appropriate for this analysis due to the nature of the theoretical arguments and hypotheses as well as the hierarchical structure of the TIMSS data—individuals nested within organizations and organizations nested within national systems. For this analysis, three multilevel models were estimated.

The first model includes only the individual student level control variables as predictors of individual student performance:

$$Y_{ijk} = p_{0jk} + p_{1jk} \text{SEX}_{ijk} + p_{2jk} \text{LANGUAGE}_{ijk} + p_{3jk} \text{SES}_{ijk} + e_{ijk},$$

where Y_{ijk} is the TIMSS math performance score for the i^{th} individual student in the j^{th} school

within national system k , and e_{ijk} is an individual student level residual. (1) By assumption, $E(e_{ij}) = 0$ and $\text{Var}(e_{ij}) = s^2$. Note that all of the regression coefficients (the p 's) in the individual student level equation are indexed by both j and k , indicating that within the multilevel model an individual student level regression coefficient is estimated for every school in the sample. In this model, the student level relationship between socioeconomic status and student achievement (p_{3jk}) was permitted to vary across schools and national systems. By contrast, the coefficients for gender and language are constrained as fixed. The term p_{0jk} is an estimate of an adjusted mean math performance score for the j^{th} school in national system k .

In the first model, each school's mean math achievement score as a function of its sex composition, mean student socioeconomic status, and mean student score on the language variable was estimated:

$$p_{0jk} = \beta_{00k} + \beta_{01k} \text{ Mean Sex}_{jk} + \beta_{02k} \text{ Mean Language}_{jk} + \beta_{03k} \text{ Mean SES}_{jk} + r_{0jk},$$

where β_{00k} is the k^{th} country's national mean math performance score, and r_{0jk} is the residual difference between a school's mean math performance score and its country's national average. By assumption, $E(r_{0j}) = 0$ and $\text{Var}(r_{0j}) = t_{00}$. The coefficients β_{01k} , β_{02k} , and β_{03k} represent school "composition effects" and are included in the model to ensure that coefficients in equation 1 reflect "true" individual level relationships (*Bryk and Raudenbush, 1992, p. 117-123*).

The second model has the same student level equation as the first, but added to the first model are measures of school administrators' managerial behavior as additional predictors of mean school performance:

$$p_{0jk} = \beta_{00k} + \beta_{01k} \text{ Mean Sex}_{jk} + \beta_{02k} \text{ Mean Language}_{jk} + \beta_{03k} \text{ Mean SES}_{jk} + \beta_{04k} \text{ Internal}_{jk} + \beta_{04k} \text{ External}_{jk} + r_{0jk}.$$

In this equation the term β_{04k} represents the relationship between a school administrators' internal management behaviors and his or her school's mean student performance, and β_{04k} likewise represents the relationship between school administrators' external management behaviors and mean student performance. In this model, the external management behaviors-to-mean performance relationship is permitted to vary across national systems but the internal management behaviors-to-mean performance relationship is constrained to be constant. (2)

In the second model, each national system's mean value for the school administrators' managerial behavior variables are included as predictors of national system mean performance:

$$\beta_{00k} = \gamma_{000} + \gamma_{001} \text{ Mean Internal}_k + \gamma_{002} \text{ Mean External}_k + u_{00k}.$$

Again, these mean values are included as predictors of national system level performance, β_{00k} , to control for potential composition effects—in this case at the national system level—and to ensure that the relationships β_{04k} and β_{04k} are true measures of the relationship between school administrators' managerial behavior and mean student performance at the school level.

The third and final model adds the national system level administrative centralization variable to the second model. Administrative centralization is included as a

predictor of both national mean performance and the school level relationship between school administrators' managerial behavior and mean student performance:

$$\begin{aligned}\beta_{00k} &= \gamma_{000} + \gamma_{001} \text{ Mean Internal}_k + \gamma_{002} \text{ Mean External}_k + \gamma_{003} \text{ Centralization}_k + u_{00k}, \\ \beta_{04k} &= \gamma_{040} + \gamma_{041} \text{ Centralization}_k \\ \beta_{05k} &= \gamma_{050} + \gamma_{051} \text{ Centralization}_k.\end{aligned}$$

In these equations the term γ_{003} represents the relationship between administrative centralization and national mean performance. The coefficients γ_{041} and γ_{051} show how the relationship between school administrators' managerial behavior and mean school performance varies according to the level of administrative centralization within a nation's educational system. In the third model, the relationship between school administrators' managerial behavior and student performance is not permitted to vary randomly across national systems.

Results

The results of the descriptive analyses show the mean and standard deviations for hours spent by each school administrator on certain managerial behaviors for both administratively centralized and decentralized systems. Although some variation exists, the mean hours reported for each activity suggest that school administrators in centralized national systems do not invest a significantly different amount of time in certain activities and behaviors than do school administrators in decentralized systems. Table 2 presents this information in a slightly different manner by listing results for centralized and decentralized national systems individually and aggregating the types of activities into internal management and external legitimacy management behaviors. Although the hours spent on external legitimacy behaviors do not differ much between centralized and decentralized systems, decentralized systems show slightly more time spent on internal management behaviors. Calculating the ratio between internal and external managerial behaviors suggests the same result: school administrators in decentralized countries devote a slightly greater amount of their time to internal management activities than do school administrators in centralized countries, although variation is high across systems regardless of level of administrative centralization.

TABLE 2
Hours/Month School Administrators Spend on Managerial
Behaviors by Country (N=4563)

National System	Internal Management Activities & Behaviors	External Legitimacy Activities & Behaviors
<i>Centralized^a</i>		
Austria	96.82	39.39
Colombia	84.20	56.53
Cyprus	75.16	44.46
Czech Republic	108.90	49.03
France	77.92	51.31
Greece	72.62	46.02
Hong Kong	103.51	35.88
Iceland	128.40	33.53
Iran	66.21	45.22
Korea	69.38	33.33
Latvia	108.89	42.14
Lithuania	106.46	51.03
New Zealand	124.21	59.45
Portugal	84.55	42.08
Singapore	92.65	45.40
Slovak Republic	121.82	43.10
Slovenia	79.33	42.52
Spain	66.89	30.93
Sweden	81.19	36.84
Thailand	73.13	72.27
Mean	91.11	45.02
Std Dev	19.98	9.87
<i>Decentralized^b</i>		
Australia	100.56	68.11
Belgium (Fl)	77.74	38.63
Belgium (Fr)	91.66	49.74
Canada	82.70	42.02
Germany	122.91	32.99
Hungary	113.62	47.03
Israel	102.08	46.00
Netherlands	92.13	26.65
Romania	93.48	42.97
Russian Federation	128.85	57.97
Switzerland	119.06	24.95
USA	84.66	65.23
Mean	100.79	45.19
Std Dev	16.81	13.74

^a Predominantly national control.

^b Predominantly local or provincial control.

Table 3 presents the estimates for each of the three multilevel regression models. In the first model, each of the individual student level control variables is a significant

predictor of student math performance. There is also evidence of significant contextual effects for both sex composition and socioeconomic status at the organizational (school) level.

Estimates for the main explanatory variables, internal and external school administrators' managerial behaviors, appear in the results for model 2. Here there is little evidence that variation in school administrators' managerial behavior is associated with variation in student performance. The relationship between time spent by school administrators on external management activities and mean school math performance is not significant in this sample of school organizations and national systems of education. The relationship between time spent on internal activities and student performance is statistically significant, but the effect is quite small. Given that the amount of time spent by school administrators on internal school activities ranges from 0 hours per month to 297 hours per month (see Table 1), this variable can account for no more than a fifteen point difference in the mean performance scores between schools in this sample. In comparison, the school level contextual effect of socioeconomic status can account for over 100 point differences in mean school performance. Overall, then, neither one of the measures of school administrators' managerial behavior is a powerful predictor of student performance.

There is little change in the relationship between school administrators' managerial behavior and student performance after controlling for the level of centralization within national education systems. The results from model 3 show a non-significant relationship between time spent by school administrators on external school-related activities and mean school performance. Further, the strength of this relationship does not significantly vary across national education systems with different levels of centralization. After controlling for administrative centralization, the relatively weak association between internal management activities and mean school performance found in the second model is no longer significant. As with the relationship between external management activities and mean student performance, the association between internal activities and student performance does not vary across different education systems with respect to administrative centralization. That the relationship between school administrators' managerial behavior and student performance changes slightly once administrative centralization is included in the model indicates at least some sort of relationship between centralized national systems and the amount of time school administrators spend on internal and external management behaviors. However, it is difficult to determine the specific nature of this relationship given these results.

The evidence does not support the first hypothesis that variation in school administrators' managerial behavior is associated with variation in student performance. The first part of my second hypothesis (that school administrators' managerial behaviors differ depending on the level of administrative centralization) is not supported either, although the argument that school administrators contextualize their managerial behavior according to rationalized and legitimate models may still be true at the organizational level. Finally, the second part of the second hypothesis (that variation in school administrators' managerial behaviors should influence student performance more in administratively decentralized than in centralized systems) is also not supported by these results. In other words, the evidence presented here suggests that school level models of managerial behavior are not influenced by national systems' level of administrative centralization, nor are they significantly or, more importantly, consistently related with student performance.

TABLE 3
Coefficients from the Multilevel Regression Model of Student Performance on School
Administrators' Managerial Behavior Variables and Selected Control Variables

Explanatory Variable	Model 1	Model 2	Model 3
<i>Individual level Predictors</i>			
Sex	-9.151*** (-8.701)	-9.151*** (-8.698)	-9.152*** (-8.702)
Language	-6.386*** (-3.800)	-6.389*** (-3.801)	-6.386*** (-3.799)
Socioeconomic Status	10.882*** (10.484)	10.883*** (10.435)	10.878*** (10.434)
<i>Controlling Predictors of Mean School Achievement</i>			
Mean Sex	12.997* (2.003)	12.790* (2.015)	12.856* (2.011)
Mean Language	-2.382 (-0.729)	-2.212 (-0.686)	-2.211 (-0.690)
Mean SES	38.747*** (7.193)	38.793*** (7.216)	38.775*** (7.216)
<i>School Administrators' Managerial Behavioral Predictors of Mean School Performance</i>			
Internal Activities	---	0.042* (2.269)	0.014 (0.438)
Internal Activities*Centralization	---	---	0.014 (0.869)
External Activities	---	-.0431 (-1.136)	0.049 (0.750)
External Activities*Centralization	---	---	-0.050 (-1.590)
<i>Predictors of National System Mean Performance</i>			
Overall Student Mean	388.823*** (21.448)	481.168*** (8.606)	483.434*** (8.549)
Mean External Activities	---	-1.386 (-1.791)	-1.441 (-1.827)
Mean Internal Activities	---	-0.319 (-0.700)	-0.357 (-0.739)
Centralization	---	---	2.283 (0.362)

* $p < .05$ ** $p < .01$ *** $p < .001$

Note: Numbers in parentheses are t -values based on robust standard errors.

Conclusion

The results described above suggest that the managerial behavior of school

administrators may be more complex than these analyses have captured. Although school administrators tailor their managerial behaviors to meet the amount of authority they are given to manage organizational processes and individual output according to their schools' organizational environment (see Table 2), cross-national variation in school administrators' managerial behavior is not significantly associated with variation in individual student performance or administrative centralization (see Table 3). There are several possible reasons for this. One is that the model for school administrators' managerial behavior is so strong that even when given authority to influence organizational processes, school administrators do not take full advantage of that opportunity and do not deviate significantly from legitimate models of managerial behavior. Another explanation is that even when variation occurs, the legitimate model of school administrators' managerial behavior is so strong and the desire for legitimacy so great that school administrators' managerial behavior is not related specifically enough to the schools' organizational and the students' individual contexts. Neither of these explanations, however, take into account the variation among national systems in spite of their level of administrative centralization (see Table 2). Yet another explanation is that the transitory and temporary influence of school administrators cannot outweigh the consistent influences of resource and opportunity over the course of individual students' school careers.

The evidence suggests, however, that school administrators' managerial behaviors relate to schools as organizations more than individual level outcomes such as student performance. Instead the institutionalized organizational model or environmental context determines which school administrators' managerial behaviors are legitimate and rational. As a result, the organizational environment or type of national system in which school administrators work may be more predictive of individual level performance than any causal link between managerial behaviors and individual performance. As stated above, level of administrative centralization does not significantly influence the relationship between school administrators' managerial behaviors and student performance either. This suggests that although organizations become structured by their environments and isomorphically change with them (*Meyer & Rowan, 1977*), school administrators' managerial behaviors may be even further contextualized so that standardization of managerial behavior through administrative centralization does not predict the managerial behaviors of school administrators as much as the specific needs and histories of the local schools and communities in which these they are situated. Therefore, school administrators' ability to contextualize their managerial behaviors within their schools is not related to student performance or administrative centralization as much as to the organizational environment of their schools.

The largely insignificant results of these analyses suggest that the technical-functional perspective affords too much significance to the standardization and accountability of school administrators' managerial behaviors when considering student performance outcomes. By testing the technical-functional arguments that level of administrative centralization and emphasis of school administrators' managerial behavior should influence student performance and finding no significant relationships, these analyses have shown that managerial accountability arguments are weak when applied across organizations and systems. Although qualitative and micro level analyses may provide evidence of tight linkages between school administrators' managerial behavior and student performance, these analyses suggest that taking contextually situated instances and transforming them into broadly applied policy or reform agenda initiatives is ill-informed and ill-conceived.

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Notes

1. Variables in boldface type are entered into the models centered about their grand mean.
2. The decisions to treat coefficients as "fixed" or "random" were based on chi-square tests for significant variation among the coefficients in the sample. Only the terms without significant variation were constrained to be fixed.

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