

**Modeling Public Management:**  
**Empirical Analysis of the Management-Performance Nexus**

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## **Modeling Public Management:**

### **Empirical Analysis of the Management-Performance Nexus**

The importance of public management to contemporary governance is a frequent theme in the academic literature (for extensive documentation see Rainey 2003), and the development of conceptual and empirical models of governance that incorporate public management as a core element has become a research activity of considerable importance (for instance, Lynn, Heinrich, and Hill 2001; also, see portions of Peters and Savoie 2000; Pierre 2000; and Kooiman 2003). Among the myriad reasons why this topic seems so persistently salient is the presumed and frequently asserted connection between managerial actions and public program performance (some of the relevant studies are covered in O'Toole and Meier 1999; Boyne, Meier, O'Toole & Walker 2005; see also Heinrich and Lynn 2000; Ingraham and Lynn 2004; Forbes and Lynn 2005; and Hill and Lynn 2005). While evidence on this hypothesized link has started to accumulate, surprisingly little systematic research had been undertaken on the matter until relatively recently, particularly given the significance of the subject.

Considering this state of affairs, O'Toole and Meier launched a major research agenda on the conceptual, theoretical, and empirical study of governance and public management several years ago, with publications commencing in 1999. The focus was and remains on public management and performance. The objectives have been to a) distill the previous knowledge concerning public management into a concise and testable format and b) demonstrate or at least scrutinize the empirical validity of the theory with a variety of systematic tests. That research agenda has produced a series of empirical (Meier and O'Toole 2001; 2002; 2003; 2004a; 2005; 2006c; O'Toole and Meier 2003a; 2004a, 2004c; O'Toole, Meier and Nicholson-Crotty 2005) and theoretical (Meier and O'Toole 2004b; 2006a; O'Toole and Meier 1999; 2000; 2003b; 2004b; 2004c) papers by the authors (see also Nicholson-Crotty and O'Toole 2004) as well as additional papers by a second generation of scholars (Donahue et al. 2004; Hicklin 2004; Fernandez 2005; Gonzalez Juenke 2005; Hill 2005; Pitts 2005; Goerdel 2006). Further work continues, with the objective of developing the agenda more fully (examples include Andrews et al. 2005; O'Toole and Meier 2006; Meier, O'Toole and Lu 2006).

Since the theoretical development and sets of findings have been distributed across a rather large number of studies, and also because there has been some development on both theoretical and empirical fronts over time, it can be difficult for researchers interested in the theme and the results to identify all key components of the exposition and examine them collectively. While the research program is by no means concluded, and while significant theoretical and measurement challenges remain to be addressed (for coverage of many of these, see Meier and O'Toole 2004b), the present juncture provides a useful occasion for taking stock and sketching developments in a more comprehensive form than is typical in articles testing a limited number and variety of propositions. Accordingly, this paper revisits that agenda to document the findings thus far reported and point toward other potential research topics with significant theoretical and empirical potential.

We begin by sketching the base model and some of its central elements. We then turn to the subject of data and data sets for conducting empirical work in support of this research agenda. The key elements of the model are covered in sequence, with conceptual, theoretical, and empirical overviews drawn from the set of studies thus far completed. The paper concludes with lists of selected theoretical contentions and hypotheses that follow from the research program

when taken as a piece.

### The Base Model

Although theoretical ideas about public management and how it shapes governance action proliferate like populations with no predators, much of that work is ambiguous in character and unsystematic in sketching causal links between public management and public program performance. Absent careful efforts at validation, it is not possible to tell which ideas provide important insights and which, although plausible, are actually dead-ends. In an effort to cull the herd<sup>1</sup> – that is, to trim productively the overabundance of theory via empirical research – we have inductively developed a formal model of such relationships – a model constructed from an analysis of the mass of theoretical and empirical (mostly case-study) material on public management and performance, as well as on some of the prominent notions of how management might matter in complex, or networked, institutional settings (see O’Toole 2000). In seeking to understand the relationship among public management, institutional arrangements, and public program performance, we begin with the following:

$$O_t = \beta_1(S+M_1)O_{t-1} + \beta_2(X_t/S)(M_3/M_4) + \epsilon_t$$

where

O is some measure of outcome,

S is a measure of stability,<sup>2</sup>

M denotes management, which can be divided into three parts

M<sub>1</sub> management's contribution to organizational stability through additions to hierarchy/structure as well as regular operations,

M<sub>3</sub> management's efforts to exploit the environment of the organization,

M<sub>4</sub> management's effort to buffer the unit from environmental shocks,

X is a vector of environmental forces,

ε is an error term,

the other subscripts denote time periods, and

β<sub>1</sub> and β<sub>2</sub> are estimable parameters.

The model incorporates three basic principles with regard to public management and administrative systems for delivering public program results. First, such arrays are autoregressive systems – that is, they create processes and operating procedures that tend to reproduce the same outputs over time. The best predictor of what an organization will do

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<sup>1</sup>Actually, at present there is no approved English collective noun for a diffuse profusion of theoretical notions. We propose “confusion.” A confusion of theories suggests both the intellectual state of affairs, along with – thanks to the verbal resemblance to “profusion” – something about an unwelcome surplus.

<sup>2</sup>In the first articles published in this research program, this term was represented by H rather than S to denote the extent of hierarchically stable structure and in recognition of the theoretical point that institutional forms for management and public programs range between fully developed bureaucratic patterns and much more loosely structured networks (for instance O’Toole and Meier 1999, 2000). The concept was later broadened to include several dimensions of stability rather than merely the structural aspect (O’Toole and Meier 2003a).

tomorrow is what it does today. The autoregressive component is captured by the lagged dependent variable, thus requiring time-series or panel data for estimation purposes. The autoregressive estimation means that the impact of any variables including management are dynamic and distributed over time. Small management actions, as a result, can have a dramatic impact over a period of years. All of our empirical studies demonstrate the importance of the autoregressive character of such systems; past performance is always the most significant factor in any of the models in which it appears. The autoregressive feature of organizations, however, is not a constant. Meier and O'Toole (2003: 695) show that the degree of autoregression is lowest in the best-performing organizations; in short, where the autoregressive nature of organizations would be of the most use, it is the least reliable.

Second, the model is nonlinear rather than strictly additive. At times factors interact in a multiplicative manner, at times the interaction is with a reciprocal function, and at other times terms add together and then interact with another factor to generate their overall impact on public program performance. These reciprocal effects were derived from the massive case study literature but generally have not been tested empirically before now.

Third, the model is contingent to reflect our view that what works in terms of public management is contingent on a variety of other factors. Among the most interesting contingencies are those involving stability. The stability term can be considered one end of a continuum, with fluid arrays on the opposite pole. Structurally this contrast parallels the distinction between hierarchies and networks. As the stability variable moves toward zero, the model estimates how management affects programs in settings marked by great and unpredictable changes over time.

In the model,  $S$  can be considered a composite of the various kinds of stability in an organizational setting. Stability means constancy in the design, functioning, and direction of an administrative system over time. Five types of stability were identified in an earlier study: structural stability, mission stability, production or technology stability, procedural stability, and personnel stability (O'Toole and Meier 2003b). In that analysis, we investigated the impact of personnel stability on the performance of administrative systems and developed empirical evidence of its positive contribution.

The model contains three different functions of management. They are efforts to manage the internal operations of the organization ( $M_1$ ), efforts to exploit opportunities in the interdependent environment ( $M_3$ ), and efforts to limit the negative impact of environmental perturbations of the administrative system ( $M_4$ ). The latter two functions in the second, or environmental, portion of the model, are often combined as  $M_2$  – defined as the ratio of  $M_3$  to  $M_4$ .<sup>3</sup> Note that this approach parses separable managerial functions. A given manager may distribute efforts across multiple functions, and some or all of the functions may be handled by multiple managers. These elements reflect the literature-documented realities of management as a multifaceted challenge and also as a frequently multi-actor phenomenon.

Finally, the model focuses on performance conceptualized as outputs and outcomes of

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<sup>3</sup>In other work we distinguish among managing outward ( $M_2$ ), downward ( $M_1$ ) and upward. See O'Toole, Meier and Nicholson-Crotty (2005) and Meier, O'Toole and Goerdel (2006).

public programs. The empirical work conducted thus far estimates performance in terms of multiple measures of these results (even for particular types of public organizations, since virtually all such programs and institutions have multiple goals) and also in terms of distributional consequences across various stakeholders. Additional performance criteria are also worth investigating (Boyne 2003).

The objective in presenting the original formal model, and the impetus behind this research agenda, is the idea that it is crucial to be precise about one's ideas regarding exactly how management might relate to performance and how it might interact with other factors to affect performance. We have stated from the outset of this work that we care less about being right in the final analysis than about being precise in what is being said (O'Toole and Meier 1999). An unfalsifiable theory is of little use in a scientific effort to understand phenomena, including such a complex and important phenomenon as public management. As our empirical agenda has proceeded, the model has been refined in certain respects as evidence has accumulated regarding the various elements and relationships in the model. Further refinements can be expected to emerge as the research program moves ahead (for some possibilities see Meier and O'Toole 2004b; additional empirical evidence regarding the functional form is found in Hicklin, Meier, and O'Toole 2006; Meier and O'Toole 2006b).

Although this model incorporates some rather specific and potentially controversial elements – for instance, the several kinds of nonlinearities implied in much of the earlier, predominantly case-study literature – it is also explicitly constructed upon some widely recognized features of governance systems. Accordingly, exploring conceptual and measurement issues through this perspective should shed light on challenges to be faced by other researchers approaching similar agendas from other directions. For example, the model builds on the widely noted tendency of managerial systems to operate in inertial fashions; it incorporates multiple managerial functions (via the M's), thus reflecting some of the rich arguments about causality found in the public management research tradition; and it treats structural features (through the S term) as offering stabilizing influences on program performance – in both the first and second terms of the model. Whether such stability is valuable or not depends, of course, on one's perspective and the current performance of a system. In short, this model represents a precise and somewhat reductionist specification that nevertheless incorporates widely recognized tendencies of public programs and their operations.

The model is also constructed to model the production of performance at a collective level, involving programs and systems, rather than at the individual level. Management, we believe, must be assessed for its impact on the productivity of such collective arrays. The institutional arrangements involved might be organizations, if all key elements of a program or set of programs are located in a single bureaucratic hierarchy; or the collectives might be networks of several organizational components that operate a single program but do so using the activities of a wide array of organizations and individuals who are not linked via a single set of hierarchical relationships.

#### **A Note on Data and Data Sets**

While we have performed some of the empirical analyses on data drawn from such diverse settings as English local governments (Andrews et al. 2005; O'Toole, Walker, Meier, and Boyne 2005), local law-enforcement efforts in the United States (Nicholson-Crotty and O'Toole 2004), and state unemployment insurance programs (Wenger, O'Toole and Meier 2006), the

great bulk of this work has been conducted on management and performance in Texas school districts.<sup>4</sup> While it was not our intent to become the foremost experts in the world on Texas school districts and while we plan on moving our theory and research to other types of contexts, two developments have slowed that transition. First, as we developed measures and gathered additional survey data, the returns to our efforts became increasingly positive rather than negative. The data set now contains a wide array of management, performance, and administrative structure variables – indeed, a collection exceeding those available in any other large-N data set. Second, we have been joined in the mining of Texas data by a large number of colleagues and former students (Hicklin 2004; Pitts 2005; Fernandez 2005; Gonzalez Juenke 2005; Hill 2005; Goerdel 2006), a development that has leveraged further the value of the data set. Although we recognize the irritation of our fellow scholars about the apparent ubiquity of Texas school districts in the research literature, the potential for developing additional knowledge remains great and the benefits of using the data set far exceed the transaction costs that would come from building another one of similar quality.<sup>5</sup> As a consequence, we have chosen to continue to build on and explore management-and-performance questions with Texas school-district data, even as we move some of the empirical work into other settings.

In this paper, we raise the question of data even in advance of sketching some of the conceptual and empirical aspects of this research program for two reasons. First, doing so allows us to provide specific measures of various concepts without continually going back and explaining new ones as each study is sketched. That process makes the current paper, and thus an assessment of the overall research program, a more coherent and understandable exercise. Second, so much research on a single data set raises questions of generalizability. We concede such concerns but suggest that they might not be as serious as some might think. School districts are in fact public organizations, the most numerous public organizations in the United States. Although they are characterized by flat hierarchies, extensive delegation to street-level operatives, excellent performance indicators (including established production functions), high levels of expertise, and a very salient concern with performance, these features are also common characteristics of many public organizations. In addition, the organizations we study range widely in terms of other variables. Some districts are well resourced, others face severe financial constraints. Some exist in challenging environments that render task difficulty substantial; others operate in benign and placid settings. Some enjoy ample human resources; others claw desperately to meet minimum standards for personnel. Some employ a mere handful of employees while others are staffed by tens of thousands. The commonalities of our units of

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<sup>4</sup>For an empirical study based on our model that employs data on the governance arrangements in the 50 U.S. states to measure both  $M_1$  and  $M_2$  and estimate management impacts on intermediate outputs, see Donahue et al. (2004).

<sup>5</sup>The solution, among those critics for whom this concentration of effort has become an irritant, is to not wait for us to develop another data set but to take the initiative to create their own. We would welcome the building of multiple first-rate data sets drawn from a variety of empirical settings. Ultimately, the development of valid general theory requires investment in such long-term and labor-intensive efforts.

analysis – commonalities, incidentally, which permit carefully controlled comparisons, thus offering an important advantage over some other performance-focused research efforts – should not blind one to the extensive variation that exists on dimensions that are important for understanding the operations of public organizations and public management. We have also endeavored to contribute to generalizability by moving the data set forward through time and replicating studies of one period with similar investigations built around later periods.<sup>6</sup>

We suggest that this approach has gained far more from the positive returns to scale of investments in this data set and the common operationalizations than has been lost in terms of generalizability. In fact, as this research agenda moves to other venues such as police departments and UK local governments,<sup>7</sup> the ability to generalize goes well beyond the number of additional cases simply because an extensive set of theoretically informed empirical findings has already been developed.

### **Management**

The theory of public management and program performance that we have been developing is highly parsimonious; it contains only four variables, or variable clusters<sup>8</sup>: performance, management, stability, and the environment. Recognizing that an operationalization and full testing of this model with any existing data set is impossible, we have opted for an incremental strategy that focuses on the link between management and performance in general and specifically on developing reliable and valid measures of performance. Within this strategic approach, we have proceeded by testing discrete portions of the model and building on the results in subsequent rounds of analysis.

We have identified and operationalized four different elements of management – managerial networking, managerial quality, managerial stability, and workforce stability.<sup>9</sup> (In

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<sup>6</sup>For the most part the early empirical studies in this research program were conducted on a 1995-99 data set. A later time series, covering 2000-2, is used in some of the more recent papers. In still other cases these data sets are combined. Other authors using the data set in this research agenda, as cited earlier in this paper, have created various different data subsets.

<sup>7</sup>Our UK colleagues, George Boyne and Richard Walker, have included a set of our management questions, reconfigured slightly for the different context, in two rounds of surveys of UK public managers. We expect to produce a series of papers using these data.

<sup>8</sup>Stability and the “environment” are clearly vectors of forces. Management, as already explained, includes multiple functions and dimensions (e.g., quality vs. quantity), and is also deployed from multiple points in a complex system.

<sup>9</sup>In a recent preliminary investigation, we have extended further the list of management variables that can be tapped with this data set (see Meier, O’Toole, Boyne & Walker 2005). Three types of managerial strategy content have been measured: defenders, reactors, and prospectors. These variables are constructed from the concepts developed by Miles and Snow (1978) and, in terms of performance, generate results that challenge some of the conventional wisdom about the relative contributions of these strategic approaches.

one additional study of law-enforcement management, a measure of internal management, our  $M_1$  term, was also developed; see Nicholson-Crotty and O'Toole 2004. Internal management is discussed more carefully below.) *Managerial networking* is an effort to operationalize our  $M_2$  term, the actions of the manager in the networked environment of a public agency. This work assumes that managers cannot engage in network-like behavior with other actors in the environment without coming into contact with them. Using the Texas School District data set, we asked top managers to rate how frequently, from daily to never, they interact with each of a set of environmental actors (five actors in a 2000 survey and eight actors in 2002 and 2005 surveys): school board members, other superintendents, local business leaders, the Texas Education Agency (the state level oversight organization), state legislators, federal education officials (2002 and 2005 only), parent groups such as the PTA (2002 and 2005 only), and teachers associations (2002 and 2005 only). These items have been factor analyzed and consistently produce a first factor that is a general networking measure with all positive loadings (at times one factor only is produced). A factor score which indicates that the manager interacts more with environmental actors is taken as the measure of  $M_2$ .<sup>10</sup>

*Management quality* ( $M_q$ ) is a measure designed to assess how well superintendents perform their jobs. The conceptual notion is that each of the managerial functions incorporated into the general model implicitly includes both a quality and quantity (effort) component. Our other measures of management, such as the managerial networking measure just sketched, tap the latter but not directly the former.

Incorporating a measure of managerial quality in a large-N analysis presents daunting obstacles. We have responded by developing a measure that effectively incorporates the judgments of locally informed political overseers, individual school boards, in annual decisions about remuneration for their top managers. The underlying logic of the measure is that superintendents are relatively mobile managers in a competitive labor market with extensive information on salaries and performance. In such a situation, the annual salary determination by a school board quite logically includes some assessment of the quality of job the manager has done. The measure essentially predicts what the manager's salary should be based on a set of factors that are highly correlated with salary (district size, human capital investments, prior performance, etc.) and uses the difference between predicted salaries and actual salaries as a estimate of management quality (see Meier and O'Toole 2002 for details).

Both *management stability* ( $S_m$ ) and *workforce stability* ( $S_w$ ) were originally constructed as measures of stability but indeed not only include aspects of management within them but might be considered at least as much a management element as a stability component – or, alternatively, as management's contribution to stability in the administrative system. Management stability is a simple measure of how long the superintendent has been employed by

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<sup>10</sup>This measure taps managers' efforts to interact with their interdependent environment. It does not reach to, or at least distinguish, efforts to manage at the network level – that is, to manage or orchestrate the full set of interdependent actors en masse. Estimating this aspect of public management is complicated (O'Toole 2000). We have made efforts to model management at the network level (Meier and O'Toole 2004b) as a part of this research program but do not delve deeply into this set of issues in the current paper.

the organization in any capacity. Such a measure is likely to reflect the manager's specific knowledge of the organization and, for the Texas data set, gives a substantial increase in scores to superintendents who are promoted from within the organization. Workforce stability measures the stability of the core production personnel, the teachers. The measure is essentially 100 minus the teacher-turnover rate. While this is clearly a measure of stability and inherently reflects the accumulated expertise of street-level bureaucrats, it is also a measure that is significantly shaped by management and management's actions. A prime function of management is to retain the human capital of the organization; this responsibility involves creating the inducements and incentives necessary to generate organizational commitment by others (Barnard 1938). Management actions in this regard encompass an array of material or utilitarian, normative, and solidary incentives (Clark and Wilson 1961).<sup>11</sup>

Interestingly, these several measures reinforce the notion that public management itself is multidimensional and its impact should be estimated with several measures whenever possible. For the Texas data set, the four management measures just sketched are essentially uncorrelated. Nonetheless, they all show positive impacts on performance.

### **Internal Management $M_1$**

Work involving the internal dimension of management has taken a back seat to our efforts to develop other quantitative measures of management. Four partial exceptions to this generalization can be sketched briefly: a study of contracting out; an effort to separate management into the dimensions of managing upward, downward, and outward (Moore 1995; Lynn 2000); a project involving law enforcement rather than public education; and another project outside the realm of public education – this one focused on unemployment compensation – in which managerial impacts on handling goal conflict and accommodation are examined.<sup>12</sup>

The decision in a public agency or public program about whether to contract out for a service or produce the service “in house” is clearly an aspect of  $M_1$ , since it involves deciding whether given tasks will be performed within the organization or by external actors. O'Toole and Meier (2004a) examined the contracting function by measuring the percentage of the school district budget that was spent on contracts for goods or services. Although many normative arguments stress the ability of contracting to improve organizational performance and to permit the organization to focus on its core functions, O'Toole and Meier (2004a: 347) found that contracting out for services was not associated with better organizational performance in school systems (and in some cases was negatively related to performance) and it was associated with lower spending on core organizational functions.

Analysis revealed that the management decision to contract out certain functions also had second-order consequences with implications for effective organizational performance. The percentage of budget contracted out was associated with lower employee salaries for core personnel (teachers), and lower teacher salaries are associated with lower student performance,

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<sup>11</sup>We are currently exploring additional dimensions of stability beyond the constancy of personnel to determine performance impacts.

<sup>12</sup>Measures of internal management and estimates of its impact in a very different context have been developed and tested by Donahue et al. (2004).

all other things being equal (O'Toole and Meier 2004a: 346). Rather than representing efforts to improve organizational performance, contracting seemed more related to a lack of expertise with certain problems and the absence of capacity within the organization to solve problems (see also O'Toole 1989). The extent of contracting, for example, was negatively associated with organizational size and positively associated with organizational turnover (O'Toole and Meier 2004a: 347), both factors that are themselves associated with lower levels of capacity.

The most striking finding concerning contracting was that it was positively associated with greater bureaucracy (measured as the ratio of bureaucrats to students), particularly central office bureaucracy. O'Toole and Meier (2004a) investigated this relationship over time using Granger causality techniques and found that the relationship between these two variables was reciprocal. An increase in central office bureaucracy generated more contracting in subsequent years, and an increase in contracting generated a subsequent increase in central office bureaucracy in later years, a phenomenon they termed a "Parkinson's Law of Contracting" (O'Toole and Meier 2004a: 349).

In an effort to distinguish between the processes of managing upward, downward, and outward (O'Toole, Meier and Nicholson Crotty 2005), we have used an additional measure of  $M_1$ , the amount of contact that the manager has with the key line managers in the core service-production organization (in this case school principals). Although this figure is not a measure of management that has much content, it does give some indication of how much time the manager spends in line activities. As one might expect with a relatively weak surrogate, the results were not impressive. At the same time, this measure of  $M_1$  was positively correlated with four of ten measures of performance in equations with appropriate controls. Two of these performance measures were for essentially bottom-level output indicators (attendance and dropouts) and two were for elite performance (ACT scores and the percent of students achieving above target levels on the ACT or SAT).

Meier, O'Toole and Goerdel (2006) have pursued this aspect of the management-and-performance agenda further by examining whether women managers get more or fewer benefits from various managerial efforts than do male managers – as some feminist critiques of organization suggest. Although the general patterns of managing outward, downward, and upward are roughly similar for men and women (women do manage downward significantly more but that is the only significant difference), the impacts of these strategies on performance do vary dramatically. Women managers appear to be able to eliminate the negative consequences of managing upward; seven of the ten relationships with performance indicators for women are different from those for men. At the same time, male managers appear to get more benefits from managing downward in the organization than do their female counterparts. Although there are some modest indications that male managers get more out of managing outward, these relationships disappear when controlling for past performance.

The third empirical exploration of the impact of aspects of internal management on performance took advantage of systematic data gathering by the Federal Bureau of Investigation and the Office of Justice Programs to examine the clearance of index crimes by hundreds of local law enforcement agencies. The Office gathered information on numerous internal management practices, especially the management of human resources, in police departments by surveying the top law enforcement official in more than 700 jurisdictions via the *Law Enforcement Management and Administrative Statistics* (so-called LEMAS) study. Nicholson-Crotty and

O'Toole (2004) factor analyzed the survey results and found that all 14 items loaded positively on a factor that clearly tapped several aspects of  $M_1$ . With appropriate controls, internal management was found to be positively related to the clearance rates of local departments.<sup>13</sup> (More broadly, the findings in this study offered support for the positive impacts of managerial networking on performance as well.)

Finally, Wenger, O'Toole and Meier (2006) sought to learn how state unemployment insurance agencies are able to manage the apparent tradeoff between the goals of timeliness and accuracy in a key category of decisions made regarding individual workers' claims. Quarterly data from across the country for the period 1997-2004 were examined via maximum-likelihood estimation and multiple regression, with an array of controls. The quantitative data were supplemented with a set of interviews with state and federal managers. Findings showed that for many of the cases improvements in one type of performance are positively related to improvements in the other; and the more performance improves, the more strongly positive the association. The qualitative data revealed a number of approaches state public managers have taken to generate such successful results.

### **Managerial Networking $M_2$**

Examining efforts by managers to interact with key stakeholders in the environment was the core of our first empirical study, in part because the concepts of performance and management in networked settings figure heavily in our theory of public management. The development of a measure for managerial networking was reviewed earlier. What do the findings show? The relevant studies can be divided into two parts, those focused on the relationship of  $M_2$  to performance and those concerned with measurement validity.

*Performance Questions.* The first task was to show that the measure of managerial networking is related to the performance of public organizations while controlling for the resources and constraints that also affect performance; that task was accomplished in Meier and O'Toole (2001: 285) for student performance on standardized tests. Two papers (Meier and O'Toole 2001; 2003) then probed the nonlinear aspects in the relationship between managerial networking and performance. Of great interest was the relationship between managerial networking and the autoregressive character of the administrative system. Although the inertial nature of a such a system can be a positive thing (it creates the patterns of efficiency we associate with organization), an excessive level of autoregression means a rigid institution that cannot adapt to change. Meier and O'Toole (2003: 696) found that at high levels of managerial networking (more than 1.5 standard deviations above the mean), the degree of autoregressivity declines precipitously. This relationship suggests that managing in the networked setting can provide a core production agency with some flexibility and allow it to break away from suboptimal routines when useful. This networking-autoregressive interaction could well be associated with managers' generating additional support for the public program or organization and thus enhancing the system's capacity to be flexible. We found greater efforts to manage externally were associated with more support from the clientele of the organization, more support from political sovereigns, and greater levels of clientele support (Meier and O'Toole 2003: 693).

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<sup>13</sup>A measure of external management was also developed and it too was related to performance in the direction expected by the model.

Our theory suggests that management should interact with various resources and constraints in a nonlinear manner. The nonlinear element implies that under certain conditions management should magnify the positive impact of resources well above normal or be able to mitigate the negative influences of constraints. Meier and O'Toole (2001: 289) showed that network management can reduce the negative impact of black and Hispanic students as well as of noncertified teachers on organizational performance; in other words, increasing the level of network management can reduce the negative correlation between disadvantaged student characteristics and overall organizational performance (for conceptualization of the variety of forms of buffering management may be able to employ to support the core production in a public program, another set of considerations that await empirical examination, see O'Toole and Meier 2003b). Similarly managerial networking selectively interacts with resources and can produce much larger gains for a unit increase in resources. The impact of increases in teachers' salaries, for example, are 3.27 times higher, the impact of smaller classes is 8.6 times higher (Meier and O'Toole 2003: 696) in organizations with high levels of management networking. Not all of the relationships between resources and constraints (the X variables) and  $M_2$  are nonlinear, however; management exercises choice in selecting the levers that might connect to performance. This choice means that some relationships will be characterized by interactions and nonlinearity and others will not.

$M_2$  also interacts with organizational performance in nonlinear ways. When the data were split into quintiles based on the level of organizational performance, the relationship between management and performance changed in different quintiles. Managerial networking matters more for units at the extremes of performance, that is, it matters more for organizations in the highest quintile and for organizations in the lowest quintile (Meier and O'Toole 2001: 695). Network management also has a greater impact in performance in organizations that have very high and very low levels of management quality (O'Toole and Meier 2003: 58).<sup>14</sup>

Subsequent work distinguished between, and estimated the relative impacts of, managing in the networked setting ( $M_2$ ), a behavioral manifestation, and network-like structures themselves. The latter involve the formal and sometimes informal regularized ties that link a core public agency to a set of other key actors in the environment, or link a set of coproducing units together.  $M_2$ , in contrast, is the behavioral actions that managers take to deal with the various nodes in the organization's setting. This distinction was examined empirically in O'Toole and Meier (2004b). The structural aspect of the network was defined in financial terms, via the degree to which the school district had to depend on others for monetary support (state and federal governments). Although managerial networking is important and positively linked to performance both when the organization is financially dependent on others and when it is financially independent, it is more important for performance among organizations that are

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<sup>14</sup>While the research thus far supports the nonlinear specification in these fashions, the evidence is not clear for the model's hypothesized nonlinear relationship of networking to organizational buffering, if the latter is interpreted as a particular form of buffer represented by the denominator of the second term of the model (a combination of S and  $M_4$ ). One recent study finds that the nonlinear form provides little or no improvement over the simpler linear version for estimation purposes (Meier and O'Toole 2006b).

dependent on others for financial support. In short, managerial networking matters more in structural networks (O'Toole and Meier 2004b: 487-8).

Managing in the network involves managers interacting with others in some type of exchange relationship. The logic of viewing managerial networking as an exchange relationship or as a set of games (see Scharpf 1993) implies that the network nodes also expect to receive something of value from the interaction. Because actors in the regular pattern of interdependence are likely to over-represent the better organized, they are also likely to represent especially well the more affluent elements in the setting. This logic suggests that managerial networking will have distributional consequences – that network interactions will benefit the more privileged elements in the context at the expense of the less well-off. Because school systems have multiple goals and the performance-appraisal system includes data on different types of students and different outcomes, O'Toole and Meier (2004c) were able to investigate the distributional consequences of managerial networking. They found that networking was positively related to high test scores for Anglo students (as well as overall test scores) and three measures of performance for college-bound students. In contrast, managerial networking was not related to pass rates for Latinos, blacks, or low income students (O'Toole and Meier 2004c: 688).<sup>15</sup> These findings suggest the operation of a politics of public management whereby the more powerful political forces are likely to exert greater influence on management as managers increase their activities in the network (see the discussion regarding structure). Similar results were also obtained with a later time-series and also a combined eight-year data set (Meier, O'Toole and Lu 2006; O'Toole and Meier 2005), and these patterns are robust to a more complete specification of managerial functions (O'Toole and Meier 2006).

*Measurement Questions.* Measurement issues in regard to management are important simply because this is one of the first efforts to create measures of management for use in a large n quantitative set of studies. The argument for  $M_2$  as a reliable and valid measure of management activities rests on several grounds. First, the factor analysis of networking items reveals that contact with environmental actors forms a consistent pattern across nodes. Such contacts are all correlated with each other, and always produce a generic first factor with positive loading regardless of how many nodes are included in the analysis.<sup>16</sup>

Second,  $M_2$  is positively correlated with a manager's time estimates of how much of their effort is focused outside the organization (as opposed to focused on internal matters, see Meier and O'Toole 2003: 698 n4).<sup>17</sup> In addition, the strong results in various linkages to performance with a wide variety of indicators (O'Toole and Meier 2003a: 54, 56) reveal a concept with a great

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<sup>15</sup>Networking was associated with lower dropout rates, a disadvantaged indicator but was not related to attendance rates, another low-end indicator.

<sup>16</sup>In subsequent analysis with UK local managers, we also consistently find a first factor with a set of positive loadings (Walker, O'Toole and Meier 2006).

<sup>17</sup>Findings in a recent study of English local government managers, designed around a similarly constructed measure, mirror those obtained from the Texas data set. See Walker, O'Toole & Meier (2006).

deal of empirical import and external validity.

Third, by comparing survey results in 2000 with those in 2002, Meier and O'Toole (2005) have provided a systematic evaluation of the concept's reliability and validity. This assessment revealed that the exact number of nodes included in the measure was not especially crucial; the five-node measure correlated strongly with the eight-node measure (as did the four- and seven-node measures). This finding does not mean that scholars can select just any set of nodes to create this measure but rather they need to select the most common nodes that occupy a manager's time. Given careful selection, the total number of nodes becomes less relevant; researchers should stress getting information on the most common nodes rather than worrying about information on all nodes.

The 2000-to-2002 comparisons also revealed that  $M_2$  is very much a managerial choice. Networking measures for a given organization at the two time points were essentially uncorrelated if the organization had changed top managers. When the same manager was in place in both years, there was a strong positive correlation between the two measures of  $M_2$ . It is clear, therefore, that despite there being distributional consequences to networking patterns (O'Toole and Meier 2004c), networking itself is driven largely by managers' decisions. It is not an epiphenomenon forced on managers by the external actors.

Finally, the two-year comparison as well as subsequent work (see O'Toole, Meier and Nicholson-Crotty 2005: 57-8) found that direct hierarchical linkages might be best treated as separate interactions. The relationship between the school board and the superintendent is essentially a hierarchical link with the school board acting as principal and the superintendent acting as agent. While interactions with the school board do correlate with interactions with other nodes, the portion of the school board variance that is uncorrelated with  $M_2$  shows a much different relationship. Superintendent-school board interactions generally demonstrate a negative impact on performance when one controls for  $M_2$  using interactions with the other nodes. Whether this negative relationship is the result of political meddling in the administrative process or merely reflects an endogenous fire alarm about performance cannot be determined from the data at hand. What is clear, however, is that the school board-superintendent relationship is of a different form with different results from the superintendent's normal effort to manage the interdependent environment (see also Meier, O'Toole and Lu 2006).

### **Management Quality $M_q$**

Management encompasses more than simply allocating one's time and effort to various tasks; it also has to do with correctly assessing problems and making good decisions. In short, there is a quality aspect to management that must be incorporated into any assessment of public management and program performance. As indicated earlier,  $M_q$ , the measure of managerial quality, is likely an element in each of the management terms in our theory. The initial assessment of managerial quality took place without considering the other management factors. That study showed that managerial quality was associated with greater organizational performance for 10 of 11 performance indicators; these findings held up in the presence of a set of controls that are commonly used in education production functions (Meier and O'Toole 2002, 638-9). Overall, management quality added approximately five percent to the organization's level of performance, about the same percentage added by managerial networking. These two impacts are likely cumulative since the two measures are uncorrelated with each other (O'Toole

and Meier 2003a: 52).<sup>18</sup> These maximum effect sizes suggest, furthermore, that public management hardly explains the great bulk of the variance in performance but is clearly consequential.

Exactly what managerial quality measures is an interesting question. The measure likely contains some assessment of the superintendent's political skills (in addition to management skills). The management quality measure is positively correlated, for example, with greater levels of community support, greater levels of parental involvement, and greater clientele cooperation (this last notion tapped via attendance rates; Meier and O'Toole 2002). Because one might think that it is community support or school board support rather than management quality that actually matters, regressions were also run with all three variables in the performance equations. These regressions showed that only 28 percent of management quality's impact comes indirectly through greater school board or community support (Meier and O'Toole 2002: 639); the remaining 72 percent appears to be a direct impact of management quality.

Management quality also demonstrates a wide range of contingency effects. It matters more in organizations that are not dependent on other units for financial support (O'Toole and Meier 2004b: 488); it has less impact in organizations with less control over their own budgets (although management quality matters in both types of environment). Management quality, networking, and the two measures of stability interact with each other in nonlinear ways. High levels of one variable can condition the impact of other variables. While the patterns are not consistent across the indicators, the patterns look reasonable from a management perspective. The impact of individual coefficients can vary as much as 300 percent. Managerial quality matters more at high levels of managerial networking (O'Toole and Meier 2003a: 59); and as one might expect, managerial quality's impact is at its highest when managers have served in the organization for a long period of time (O'Toole and Meier 2003a: 60, figure 4).

#### **Stability $S_m$ and $S_w$**

Two concepts of stability, management stability ( $S_m$  or a manager's longevity in the organization) and workforce stability ( $S_w$ ), were introduced simultaneously. Although initially offered as stabilizing factors (and these variables are such), each also contains an element of management. Longevity within the organization is associated with a manager's knowledge of the organization; high levels of workforce stability, particularly across similar organizations, likely reflect in part elements of good human resources management.

Both managerial stability and workforce stability are associated with higher levels of public organizational performance even with controls for other factors that influence results (O'Toole and Meier 2003a: 56), employee stability in eight of ten cases and managerial stability in five of ten cases. The sum total of these stability impacts is approximately equivalent to the sum of the two managerial impacts discussed above, although front line (workforce) stability is the more important influence of the two.

Although the measures of stability are generally uncorrelated with the measures of

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<sup>18</sup>It is also uncorrelated with the measures of management stability and workforce stability (see O'Toole and Meier 2003a). Indeed, in additional analyses underway, the correlations among these four management measures along with three additional ones developed recently are all close to zero (Meier, O'Toole, Boyne, & Walker 2005).

managerial networking and managerial quality, they do interact with each other to influence the relative impact of the four factors. As an example, managerial stability matters more when managerial quality is lower (O'Toole and Meier 2003a: 59). For another example, greater workforce stability is associated with a decline in the impact of managerial networking (O'Toole and Meier 2003a: 60). In terms of the interaction of stability with the environment, managerial stability and workforce stability matter in both diverse and less diverse networks, as well as financially dependent and financially independent environments (O'Toole and Meier 2004b: 482-6). Both factors, however, have more influence on organizational performance when an organization is dependent on others for funds; in short, stability matters more in interdependent (network-like) settings. So rather than following the general normative prescription in the management literature that one needs to make the organization complement the environment (e.g., rigid hierarchies in stable environments), the empirical findings suggest that organizational stability can substitute for environmental stability and thus influence performance.

### **Structure: Networks and Governance Levels**

The relationship between management and performance in different types of environments (network-like settings, as well as settings where political failure is present) and for different levels of governance have also been investigated. The research agenda distinguishes between the structural aspects of networks (relationships of ongoing interdependence) and the interaction with or management of network nodes (see O'Toole and Meier 2004b; Meier, O'Toole and Lu 2006; O'Toole and Meier 2006). Empirically these concepts are also different and, as noted above, a network-like structure often is best served by organizations with substantial stability at the management and production levels. In addition, we found that an organization with less diverse sources of funds (that is, in a less fiscally networked setting) will derive more benefit in terms of performance from a given level of managerial networking and managerial quality. Other relationships between network structures and management have been discussed above in the various management sections.

Because public management takes place within a political environment, investigating how politics relates to public management is extremely important. Using the normative logic of the politics-administration dichotomy, Meier and O'Toole (2004a) argued that when the political institutions fail to perform their vital role of representation, managers must not only do their job but must also take up the slack for the political failings. Their contention was that in the presence of underperformance by the political system (measured as failure to represent the diversity of the community), the impact of management would be greater, but only on politically salient issues. Using eight years of data, they found that in situations where the school board did not represent the diversity of the population well, the overall magnitude of public management's impact on performance increased. This increase occurred, however, only on salient issues, that is, on those issues where one might expect the political system to make a contribution.

Some recent work (Meier and O'Toole 2006a, 2006c; Meier, O'Toole and Nicholson-Crotty 2004) has focused on multilevel governance using the theory of representative bureaucracy. Latino representation at four different levels was measured – the school board, the superintendent, school administrators, and teachers. The dependent variables were measures of Latino student performance (a full array of control variables was included in all equations). The purpose of the study was to sort out the relative influence of these levels of governance.

The model assumed a hierarchical set of relationships whereby school board members

influence superintendents who influence principals who influence teachers, but that the influence did not flow from the bottom up (see Meier, O'Toole and Nicholson-Crotty 2004); subsequent work using a time-series data set has demonstrated that assumption to be incorrect in that the levels have reciprocal relationships with each other (see Meier and O'Toole 2006c). The study found that each of the levels of governance had some impact on student performance. At the highest levels that influence was generally indirect, that is, it operated through lower echelons; on a few more symbolic criteria, however, analyses verified direct impact. The largest direct representational influence as well as the largest total representational influence could be found at the street level – that is for Latino teachers (Meier, O'Toole and Nicholson-Crotty 2004: 41-2).<sup>19</sup>

Proximity of the levels seemed to matter in this process. For example, mid-management (school administrators) appeared to be the predominant influence on the composition of street-level personnel (Meier, O'Toole, and Nicholson-Crotty 2004: 39-40), and school boards appeared to influence the administrative level the most but also had some impact at the street level. The influence of political appointees, at least for these measures, was the weakest for the four levels of governance examined.

### **Theoretical Development: Retrospect and Prospect**

This recounting of many findings and partial tests of the model sketched at the outset of this paper is not complete, but it should provide an overview of how this research program has developed, and something of how the pieces fit together. Theory development and theory testing regarding public management and governance quite clearly must go hand in hand as information about the way the world operates feeds back into our models. In the course of this research agenda, we have often made some theoretical assertions that seemed likely to be true, even if we did not have much information on which to base such expectations. In other cases we were required to develop what Lynn, Heinrich and Hill (2001) refer to as a convincing causal story – that is, a very plausible and explicit logic by which empirical relationships we were able to uncover could be explained. At still other times we have worked primarily at the theoretical level in an effort to clear out more underbrush for our empirical work (see Meier and O'Toole 2004a).<sup>20</sup> As the research program has progressed, this iterative process has produced numerous theoretical propositions and also hypotheses with at least some empirical support, and that

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<sup>19</sup>This set of findings pertains to the representational function per se. It does not negate the considerable managerial impacts on performance that are tapped in ways other than through active representation of, for instance, ethnicity.

<sup>20</sup>The current paper does not recount the range of conceptual and theoretical issues we believe deserve explication as the research program continues to advance. Such a list would include many additional topics, such as: estimating the performance impacts of other types of stability, exploring public management at the network (rather than organizational) level, examining overall impacts of management from multiple managerial positions, and analyzing interactions with and relative influence of political overseers. For coverage of many such parts of the agenda see Meier and O'Toole (2004b).

deserve further attention and investigation by researchers interested in public management and performance.

The contributions entailed in individual, discrete investigations are clearly the most important research products for governance and public management. In a field with a relative paucity of systematic empirical research, clearly focused and rigorous studies are vital. One feature often – and necessarily – missing from such narrowly focused studies, however, is the placement of targeted theorizing and sets of findings into a broader scheme, and in a larger program of research activity.

This paper has been designed to collect the numerous separate contributions of a set of such focused explorations and array them in a broader context so that others can consider the assembled and active research program as a piece. We have tackled one large topic – public management and performance – and sought to theorize broadly. We have taken explicit account of the range of both managerial functions and also structural contexts in developing an explicit, parsimonious formal model that is nonetheless capable of being tested in steps. We have sought appropriate empirical settings for analysis opportunistically, and that approach has led us to invest very heavily, albeit not exclusively, in one particularly appropriate large-N data set.

With a series of (now) more than 25 studies, we have explored public managerial behavior, quality, structural settings, and important aspects of the political settings within which managers ply their craft. We have been interested in a range of performance metrics. In almost all these studies, the management-performance connection has been the central aspect of the governance question.

Much has been accomplished. We have developed surprisingly consistent support for some of the key relationships about which we have theorized, as well as some unanticipated but stimulating surprises. We have found overwhelming evidence that management contributes positively to public program performance, as well as that “management” features can and should be measured via multiple indicators. We have uncovered clear signs of relatively complex but plausible nonlinearities. And we have begun to document the ways that politics and management interrelate as public programs operate.

Still, the research program continues to develop. Additional aspects of M, S, and X are currently under active scrutiny – theoretically and also empirically. Hypotheses abound and multiply at least as fast as can the analyses on which they must ultimately be judged. Internal management as well as managerial strategy, thus far understudied in this program, are being measured and analyzed. Structural variation needs to be explored more systematically. And valuable though one extraordinarily rich data set has been to some of our colleagues and to us, additional contexts demand attention and additional data must be gathered and mined.

Plenty of challenges remain for this research program to address. But this paper documents that plenty of progress can be demonstrated. The program and this report are works in progress. Keep watching this space.

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