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The Big Questions of Public Management

Robert D. Behn, Duke University

What are the big questions that scholars of public management should be attempting—through their research—to answer? Robert D. Behn suggests three consciously prescriptive questions:

(1) The micromanagement question asks how public managers can break the micromanagement cycle of procedural rules, which prevent public agencies from producing results, which leads to more procedural rules, which.... (2) The motivation question asks how public managers can motivate people to work energetically and intelligently towards achieving public purposes. (3) The measurement question asks how public managers can measure the achievements of their agencies in ways that help to increase those achievements. Moreover, Behn argues, if the study of public management is to become “scientific,” it needs to focus on these and other big questions.

Whenever physicists get together, they discuss the big questions of physics. Physicists have big questions about the universe: How did the universe begin (Weinberg, 1993)? When did the universe begin? How big is the universe (which is the same question as how old is the universe) (Flamsteed, 1992)? Will the universe continue to expand forever, or will it eventually stop expanding and then start contracting (Weinberg, 1993; 37; Ferris, 1988; 354)?

Physicists also have big questions about the composition of matter. What are the most basic building blocks or elementary particles from which all physical objects are constructed? How do these building blocks interact? That is, what are the forces that hold these elementary particles together or push them apart (Adair, 1987; 208-229; Ferris, 1988; 285-299; Rohrlich, 1987; 196-201)?

Indeed, in physics, there are numerous big questions. For example, Nobel Prize winner Steven Weinberg (1993; 75) writes, “The theory of the formation of galaxies is one of the great outstanding problems of astrophysics.” “The formation of galaxies provides one of the thorniest problems in cosmology,” observes Michael Rowan-Robinson (1977; 60). “Despite intensive work, no solution has been produced which does not amount to saying: a galaxy forms because the initial conditions of the universe preordained that it would.” Physicists all know what these big questions are, what alternative answers exist, and how different people are attempting to sort out these alternatives, to create new alternatives, and answer the questions.

Get a group of paleontologists together, and they, too, will begin discussing the big questions of their field: Why did the dinosaurs die out? When did humans get to the American continents¹ (Gutin, 1992)? One of the big questions for paleontologists and paleoanthropologists is: How did human life evolve? At the moment, there are two competing theories (Gutin, 1992). There is the regional continuity theory: *Homo erectus* left Africa about a million years ago and evolved independently into three different, modern populations of *homo sapiens* originally based in Europe, Asia, and the Middle East and Africa (Li and Etlar, 1992). There is also the out of Africa theory: we are all the direct descendants of a single *homo sapien*, a woman called Eve, who lived in Africa only 200,000 years ago (Cann, Stoneking, and Wilson, 1987).

Stephen Jay Gould, the prolific paleontologist, describes how the revision of the history of evolution forged by the fossils found in the Burgess Shale of British Columbia "poses two great problems about the history of life." First, why did modern, multicell life erupt in the Cambrian explosion of diversity rather than evolve slowly and continuously? Second, why did some of the creatures created by the Cambrian explosion survive and evolve while others disappeared (Gould, 1989; 55-60, 227-233)?

In July 1900, at the International Congress of Mathematicians in Paris, the mathematician David Hilbert (1902) set forth what he thought were the 23 most important unsolved problems in mathematics—the ones that he thought his discipline should address in the next century. Nearly a century later, mathematicians continue to work on some of Hilbert's problems (Browder, 1974).

Get any group of scientists from any branch of science together, and they will start talking about the big questions in their field, the latest research published about those questions, and how they, through their own research, are attempting to tackle those same big questions.² Any field of science is defined by the big questions it asks.

The same ought to be true for scholars of public management. We, too, ought to have our own big questions that we discuss and debate when we get together. These are the questions on which we ought to focus our research. These are the questions we ought to seek data and devise clever methodologies to answer. These big questions ought to define the field of public management.

The Big Questions and Science

The big questions about physics are what make it a science. Physics always has a number of big questions it is trying to answer, and it has a sense of how those questions should be answered. For some of the big questions, physicists have satisfied themselves that they have the answers. The big-bang theory of the beginning of the universe is so widely accepted by cosmologists, that it is called "the standard model" (Weinberg, 1993; 4). Although every six months the Berkeley Lawrence Laboratory publishes a list of literally hundreds of subatomic

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particles (Weinberg, 1993; 88), physicists generally agree upon a standard model for the structure of truly elementary particles: 24 bosons (including photons), 6 leptons (including the electron and the neutrino), and quarks. Baryons (including protons and neutrons) are each made up of 3 quarks, while mesons consist of 1 quark and 1 anti-quark. There are 18 different kinds of quarks: They come in 6 flavors (up, down, strange, charm, top, and bottom) as well as in 3 different colors (red, green, and blue) (Adair, 1987; 347; Ferris, 1988; 292-298; Rohrlich, 1987; 196-201).

No physicist, however, has seen a quark. Indeed, theoretical physics suggests that free quarks cannot exist (Rohrlich, 1987; 198; Weinberg, 1993; 141, 164-165). Thus, a big question for experimental physics is: Do quarks exist? Weinberg (1993; 142), an elementary-particle physicist, writes: "The puzzle of the nonexistence of isolated free quarks is one of the most important problems facing theoretical physics at the present moment."

Some of us may think that these big questions are not all that important. Would it really have been worth ten billion dollars to build a 54-mile subatomic racetrack in Texas that could crash two beams of protons into each other hoping to smash them apart into their most elementary, component particles, that is, quarks? Theoretical physicists predict what these elementary particles are. Experimental physicists need high-speed accelerators to break down stable particles into these predicted elementary particles so that they can be observed (or so that some phenomena predicted by their existence can be observed) and thus verified. In this time of budget deficits, a lot of us, and particularly those of us in the U.S. House of Representatives, did not think that answering this question warranted building the Superconducting Supercollider. That does not mean that the question is not a big one for physics. It simply means that the nonphysicists of the country would rather spend \$10 billion on answering some other question, or perhaps on acting on the basis of some question to which (we think) we already have the answer.

The Scientific Method and the Big Questions

How do scientists answer their big questions? Success involves multiple ingredients: wisdom, hard work, and, sometimes, luck. In science, observe Nathan Spielberg and Bryon D. Anderson (1987; 12), "Often dumb luck, sometimes called serendipity, plays a role either in revealing a key piece of information or in revealing a particularly simple solution." Sometimes, such serendipity helps scientists discover the answer to a question that they did not know they were supposed to be asking. In an effort to answer one big question, they may end up

Scientists *do not start with data or methods.*

Scientists start with questions.

answering another. For example, in 1826, Otto Unverdorben was attempting to produce a synthetic form of indigo but instead discovered aniline, an important molecule in the chemical and pharmaceutical industries (Messadié, 1991; 2, 18).

Serendipity strikes a lot more frequently, however, than scientists recognize it. That is, most of the time the lucky observation of some revealing data produces no increase in knowledge; those who were blessed with the serendipitous data did not recognize its implications. After all, how many people over the millennia were bopped on the head by a falling apple before Isaac Newton discovered gravity? Every ancestor of Newton had watched objects fall; yet he was the first one, building on the ideas of Kepler and Galileo, who discovered the law of gravity. It takes a prepared scientist—someone who knows what the big questions are—to recognize when an answer to an unanswered question fortuitously presents itself. For serendipity to really work in science, the lucky scientist must simultaneously recognize both the answer and the question.

Joseph H. Taylor, Jr., and Russell A. Hulse were awarded the 1993 Nobel Prize for physics for discovering a binary pulsar. Pulsars are collapsed, rotating stars that emit beacons of electromagnetic radiation, much as a lighthouse emits a beacon of light. Moreover, the rotational frequency of the pulsar, and thus the timing between their beacons of radiation is extremely constant. Taylor and Hulse, however, discovered a pulsar whose frequency was modulated. This, obviously, was pure luck. Even discovering a new pulsar is luck; you just happen to point your radiotelescope in its direction.

Recognizing the implications of scientific luck is not luck. Taylor and Hulse recognized: (1) that frequency of the pulsar's beam varied because it was rotating in orbit with another pulsar (whose beam was not pointed towards earth), (2) that this pair of orbiting pulsars should emit, according to Einstein's theory of general relativity, gravity waves, and thus (3) that this pair of pulsars could be used to test the theory of general relativity. Taylor and Hulse won the Nobel Prize not for finding a pulsar with a beacon whose frequency modulated but for recognizing the implications of that modulation and using that implication to test one of the big questions of 20th-century physics: Is the theory of general relativity correct?

As scholars of public management aspire to make their field a science, they, too, need to focus on big questions. Unfortunately, the effort to create a science of administration—to make management look more like physics (or, at least, more like economics)—has led to an emphasis on methodology, on the manipulation of data. After all, real scientists work with real data, that is, numbers (preferably numbers with many significant digits). Too often, the result is methodologically sophisticated research that address small, trivial issues.

A reverence for methodology is not, however, what makes an

endeavor scientific. It is an effort to answer major, important questions in a systematic way. What systematic means depends upon the question and upon the type of data and corresponding methodologies that are available to help answer the question. The work is driven by the question, not by the data or the methodology. The scientist does not ask: What question does my data help me answer? Nor does the scientist ask: What question can my methodology help me answer? Rather, the scientist asks: What data and methodology would be most helpful in answering my field's questions? And the leading scientists ask: What data and methodologies would be most helpful in answering my field's *big* questions?

Scientists do not start with data or methods. Scientists start with questions.

Three Big Questions in Public Management

Does the field of public management have 23 big questions for the next century? Some scholars may argue that there are fewer truly big questions; some may think there are more. Here are my nominations for three big questions (concerning the fundamental management dilemmas of micromanagement, motivation, and measurement) that certainly belong in the top ten.

1. Micromanagement: *How* can public managers break the micromanagement cycle—an excess of procedural rules, which prevents public agencies from producing results, which leads to more procedural rules, which leads to...?
2. Motivation: *How* can public managers motivate people (public employees as well as those outside the formal authority of government) to work energetically and intelligently towards achieving public purposes?
3. Measurement: *How* can public managers measure the achievements of their agencies in ways that help to increase those achievements?

All three of these questions are *management* questions—prescriptive questions. Each asks “*How* can public managers...?” Each question asks *how* public managers might accomplish something—*how* they might best deal with a fundamental dilemma that confronts most (if not all) public managers. Each question is based on the assumption that the job of the public manager—and public-management scholars—is not only to understand the behavior of public agencies but also to improve the performance of these agencies. There are other, social-science versions of these questions that are descriptive (e.g., What motivates people?) that may help answer these management questions. Nevertheless, these three big questions are consciously prescriptive. The purpose, for example, is not merely to study motivation but to understand how our existing knowledge about what motivates people combined with new insights can actually be used by public managers to improve government performance.

If public-management scholars could answer these three questions, they would make a significant contribution to the

ability of public managers to get their public agencies to produce results. Indeed, they would also make a significant contribution to producing these results.

The Micromanagement Question

Scholars, journalists, public managers, and public commissions have identified micromanagement as a major problem in the public sector. "Congress is commonly criticized for 'micromanaging' government agencies," writes James Q. Wilson (1989; 241); "it does, and always has." "[T]here are factors that lead the government to attempt to micromanage (viz., monitor and control in exacting detail)," write Robert Austin and Patrick Larkey (1992; 4), and this "micromanagement is expensive." The National Commission on the State and Local Public Service (1993; 2)—The Winter Commission—sought to "move us away from an encrusted and outmoded system of command and control and its rule-bound management that emphasizes constraints and process." The National Performance Review (1993; p. iii) sought to eliminate "the structures of overcontrol and micromanagement that now bind the federal government."

The micromanagement tale is old and familiar.

The legislative branch is, for some reason, unhappy with the way an executive-branch agency is behaving; so the legislators impose some rules on the agency. (This unhappiness often arises out of a scandal or out of some error that is transformed into a scandal.) These new rules prevent, or at least constrain, the agency from doing what the legislature dislikes. Unfortunately, these rules also constrain the agency from producing the results for which it is responsible. The rules may merely impose opportunity costs on the agency, requiring it to devote some of its limited resources to complying with the rules (or at least filling out the paperwork to show that it complied with the rules). Or the rules may actually prevent it from taking an intelligent and useful step to produce the desired results. In any case, the agency's productivity does not match expectations.

This makes the legislature unhappy—again. Clearly the agency is not being managed intelligently. The legislators, however, cannot manage the agency directly. They can only do it indirectly by imposing some additional rules to help the agency better understand what it is supposed to do. The agency's productivity declines still further, which reinforces the legislature's view that the agency is badly managed. So it imposes still more rules. Soon, the agency is devoting a significant portion of its resources to complying with all these rules. Indeed, the agency may conclude that its only real purpose is to follow the rules.

The legislature may conclude the same thing: If all the agency can do is follow rules, we had better write those rules right so that they don't have any opportunity to misinterpret the rules and make an even bigger mess.³

All this might be reduced to a succinct question:

The micromanagement question: How can public managers break the micromanagement cycle of distrust, rules, poor performance, more distrust, more rules, more...?

This description of the problem suggests that the legislature is the cause of the problem.⁴ Indeed, merely calling the problem one of micromanagement implies that the legislature is the bad guy. I suspect many of those who are part of the movement to deregulate government (DiIulio, 1994) may think precisely that.

The Trust Question

Yet, the problem's causal arrow does not just run in one direction. Certainly the legislative branch distrusts the executive branch; that is, in fact, why it imposes so many rules. At the same time, however, the executive also distrusts the legislature (National Academy of Public Administration, 1992). In fact (although it would require some sacrifice of the alliteration advantage), this big question might be better defined as one of trust: How can the legislative and executive branches learn to trust each other? Thus, another statement of this big question might be:

The trust question: How can public managers reduce the distrust that appears to be inherent in the relationship between the legislative and executive branches of government—and that also inhibits the performance of government agencies?

Of course, the legislature and the executive are not the only two units of government that fail to trust each other. The political managers of public agencies frequently distrust the career employees of that agency (Hecl, 1977; 181-190; Kaufman, 1981; 192). This is particularly true when the political managers have just taken over their jobs; it is doubly true when they have just taken over their jobs from political managers of the opposite party. Nevertheless, even when political managers have been in the job for a while (although, too often, "a while" never lasts very long), they often do not trust their career employees. Consequently (according to Newton's third law of politics: "To every political action there is always opposed an equal reaction"), the career employees react by not trusting their political managers. Similarly, of course, the staff and oversight agencies do not trust the line agencies (and vice versa). The question about trust, therefore, might be broadened:

The trust question (modified): How can public managers reduce the distrust that appears to be inherent in the relationship between different units of government—and that consequently inhibits the performance of government agencies?

Whether you call it the micromanagement question or the trust question, the question is certainly a big one that is clearly worthy of serious thought and research.

Indeed, a variety of recommendations have been offered to deal with this trust problem. The Winter Commission, for example, calls for “a new way of operating” in the public sector, “which is to build trust and lead.” The National Performance Review (1993; 14) concluded: “We cannot empower employees to give us their best work unless we eliminate much of the red tape that now prevents it.”

The theoretical and empirical support for such recommendations may not, however, be as strong as we, or their advocates, would like. To develop specific policy recommendations that address the big question about trust, we must first answer a number of smaller but still important theoretical and empirical questions about trust:

- ◆ What exactly is the source of the distrust between the legislative and executive branches?²⁵
- ◆ What examples exist of that distrust being significantly reduced?
- ◆ How was that distrust reduced? Who took what critical actions? What special circumstances contributed to this reduction in distrust? Can those actions and circumstances be reproduced in other settings? If so, what does it take to do that?
- ◆ Are there other ways to reduce distrust?

The Governance Question

In some ways, these big questions about micromanagement and trust are simply a reformulation of the old question about “governance.” How should government function? How should we decide what government will do? How should responsibilities be divided between the legislative and executive branches? How should responsibilities be divided between political executives and career civil servants? To what extent should one branch be able to check the other? After all, James Madison did not believe in trust.

In articulating his dichotomy between politics and administration, Woodrow Wilson sought to answer this governance question. As Frank J. Goodnow (1900) summarized it, “Politics has to do with policies or expressions of the state will. Administration has to do with the execution of these policies.” The political leaders would make the political decisions about public policy; then the career officials would simply figure out the most efficient way to implement these policies. Woodrow Wilson (1887) wrote: “this discrimination between administration and politics is now, happily, too obvious to need further discussion.”

Unhappily, this simple division of labor is much harder to implement than to assert. The legislature’s (or executive’s) policy statements are rarely so explicit as to leave only the technical details of implementation to be worked out by the administrative agency. Indeed, the task of enacting legislation—of negotiating an agreement among a majority of legislators—often requires that these “expressions of the state will” be indefinite, unclear, ambiguous, confusing, or even contradictory. Conse-

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quently, “the execution of these policies” necessarily involves choices among policies. Asked to pursue wondrous policies yet given only limited resources, public managers must choose the policies on which to concentrate those resources. When an agency manager makes such choices, he or she is also choosing with which key legislators (or political executives) to disagree. These policy makers may then react quickly to establish their supremacy. That is when agency managers scream “micromanagement.”

The clean division of labor between politics and administration is an appealing concept that is, unfortunately, completely unconnected to reality. Thus, the governance perspective offers another way to frame this big question:

The governance question: How can public managers help clarify how legislators, political executives, and career civil servants should share responsibilities for policy-making and implementation?

The Entrepreneurship Question

In thinking about the tasks of policy making and implementation, Colin S. Diver (1982) has defined two models of public management: the engineering model and the entrepreneurial model. The engineer merely “supervis[es] the execution of a previously defined governmental policy;” the entrepreneur “defines rather than accepts goals.” Each model has its own advantages and drawbacks.

The entrepreneurial model offers a good description of reality but creates an ethical problem: It is in “apparent conflict with democratic theory.” This, writes Diver, creates a dilemma: “The entrepreneurial model seems, to many at least, the more faithful image of reality, yet it is morally unacceptable. The engineering model is ethically preferable, but unrealistic.” To resolve this dilemma, Diver also offers two approaches: “Make the engineering model more realizable or rehabilitate the ethical status of entrepreneurship.” Most of the effort has gone into the first strategy, whose success, notes Driver, is “severely limited by some rather intractable realities.” Thus, he suggests that it might be better “to elevate the ethical status of the entrepreneurial strategy.”

But the task is not merely to improve the reputation of public entrepreneurship. Rather, to resolve the dilemma between engineering and entrepreneurship, we must determine what kind of entrepreneurship is acceptable and desirable. Whom will we permit to be entrepreneurs? Whom do we want to be entrepreneurs? What are the ethical boundaries on entrepreneurship? What is our political philosophy about entrepreneurship by public managers?

The entrepreneurship question: How can public managers define and develop an entrepreneurial approach to public management that is not only necessary but also legitimate and ethical?

These are not the only definitions of the big question about micromanagement or trust or governance or entrepreneurship. There are a variety of other ways to frame the same or similar questions,⁶ and not much will be gained by debating the exact formulation of the question. Rather, the issue is whether this is a big question—worthy of serious research—and, if so, what approaches might be best for answering the question.⁷ Before a major research effort is launched to answer the question, however, we ought to agree that it is indeed, one of the big questions of public management.

The Motivation Question

Public managers frequently complain about their inability to motivate their subordinates: “How can you motivate anyone in the public sector? Everyone is protected by civil-service rules. We can’t fire anyone. We can’t reward anyone. How can they expect us to get anything done?”

Such a recitation of the motivational impotence of public managers is, implicitly though clearly, based on the carrot-and-stick theory of motivation. This theory is—again implicitly, although again just as clearly—based on the assumption that you motivate a person the same way that you motivate a donkey. Either you hold a carrot in front of the donkey/person to motivate it forward; or you hit the donkey/person with a stick to do the same thing. Frederick Herzberg (1968) divides this “kick-him” approach into the “negative physical KITA,” the “negative psychological KITA,” and the “positive KITA.” Harry Levinson (1973) simply calls it “the Great Jackass Fallacy.”

In schools of public policy (perhaps not so much in schools of public administration), this carrot-and-stick theory is widely employed as the primary basis for thinking about motivation. It is called economics.

The thinking about motivation in public policy schools is dominated by the economic perspective, in part, because economists dominate these faculties. Psychologists also worry about motivation and do research on the subject. They even write textbooks titled: *Motivation* (Beck, 1990; Mook, 1987). Yet how many schools of public administration or public policy have a single psychologist on the faculty who does research or teaches a course on motivation in public sector organizations?

Moreover, in recent years, economists have been particularly entrepreneurial—broadening the application of their favorite paradigms from the behavior of markets to the behavior of organizations. Specifically, economists have defined the central problem of behavior within organizations as the relationship between principals and their agents (Moe, 1984). The central problem of this relationship is not one of mere *motivation* but one of *control*.

Indeed, for the public sector, economists have transformed the big question about motivation into a question about control:

Indeed, for the public sector, economists have transformed the big question about motivation into a question about control.

The motivation question (principal-agent version): How can the legislature control the executive, and how can political managers control civil servants?

This principal-agent version of the motivational question involves, however, several implicit assumptions. The first is that the principal wants to “control” the behavior of the agent. Behind this assumption of “control” is an even more basic and subtler assumption: The principal knows what he or she wants the agent to do. That is why the problem reduces to one of control. Because the principal knows what should be done, the only remaining task is to get the agent to do it.

In fact, however, the principal often does not know what should be done to pursue a particular goal or what goal should be pursued. That is why legislation is so vague. Congress is not just one, single, unified principal or, in Graham Allison’s terms (1971), a single “rational actor.” Rather, Congress is multiple principals with differing views (Wilson, 1989; 254-256). How can the question be “how can the legislature force the executive to accomplish its goal?” when the legislature does not know what goal it wants accomplished? Moreover, even if the legislature could, somehow, agree on what it wanted the executive to do, it could hardly think through exactly how it wanted the executive to do it.⁸

Although hierarchical organizations that emphasize control have some obvious advantages, organization theorists have identified alternatives. For example, over three decades ago, Tom Burns and G. M. Stalker (1961) defined (from their studies of Scottish and English firms) two “divergent systems of management practice.” For the traditional “mechanistic management system,” responsibilities and tasks are narrowly and explicitly defined. In contrast, their “organic” form is characterized by jobs that “have to be redefined continually,” by individuals who carry out their responsibilities using “their knowledge of the tasks of the firm as a whole,” and by communications that “resemble lateral consultation rather than vertical command” (pp. 5-6, 119-122). Indeed, managers (particularly managers in the private sector about which economists have traditionally been most interested) have long been experimenting with non-hierarchical forms of organization and with styles of leadership and management based on human relationships other than command and control (Womack, Jones, and Roos, 1990).

Ironically, at a time when much of the thinking and exploration by public sector managers is focusing on how to avoid the problems created by command-and-control hierarchies (Osborne and Gaebler, 1992; chap. 9)—to move beyond what Michael Barzelay (1992; chap. 1) calls “the bureaucratic paradigm”—principal-agent models have become the public-policy scholar’s favorite (perhaps even dominant) way of think-

The measurement question: How can public managers measure the accomplishments of their agencies and of themselves?

ing about motivation. To contemporary economists, the principal-agent “problem” is how can the principals “control the behavior” of the agents (Moe, 1984; 755).⁹ To contemporary managers, the principal-agent problem is how can we avoid the dysfunctional behavior that results when the principals try to control the agents.

One more assumption behind the principal-agent formulation of the motivation question is that people prefer leisure to work. This assumption is supported by numerous bumper stickers that proclaim: “I’d rather be sailing”; “I’d rather be golfing.” Most of us would, indeed, prefer to spend the afternoon at the ballpark than in the office. Or, if for some perverse reason you would rather be pounding away on your keyboard than watching Junior Griffey go up against Roger Clemens, I am sure that you can think of some other activity you would prefer to either of those. For most people, the thing we get paid to do is not the number-one item on our list of ways to spend the day.

Still, psychologists (although not economists) tell us that meaningful work can be motivating (Herzberg, 1968; Maslow, 1943; McGregor, 1957). In the public sector, this can be particularly true. People do not enter the field of social service to maximize income; they hope to do meaningful work.¹⁰ If legislators, or political executives, or career executives can find some way to exploit that desire to do meaningful work—to take advantage of the beneficial self-selection¹¹ that leads people to choose public sector jobs—they may gain help not merely in carrying out standard operating procedures to achieve goals, and not merely in figuring out how best to achieve those goals, but also in determining what goals are both worth pursuing and pursuable.

Thus, the big question about motivation might be defined as:

The motivation question: How can public managers motivate public employees (and citizens too) to pursue important public purposes with intelligence and energy?

One assumption behind this phrasing of the question is that public managers do not necessarily know how best to achieve public objectives. A second assumption is that the managers may not even know what objectives should be pursued (particularly given that some objectives will be easier to achieve than others). A third assumption is that a lot of people within (and outside) any public agency have a lot to contribute not only to achieving such objectives but also in choosing among objectives and deciding how best to achieve them.¹²

Principal-agent theory is also based on the assumption of an asymmetry of information, and the assumption that the agent

knows more (Moe, 1984; 754-757). Rather than ask how the principal might take advantage of the additional information that the agent might have, principal-agent theorists ask how it might be neutralized. The National Performance Review (1993; 3) described this mentality well: “We assume that we can’t trust employees to make decisions, so we spell out in detail how they must do virtually everything, then audit them to ensure that they have obeyed every rule.” In contrast to this view is Vice President Gore’s assumption that “The people who work closest to the problem know the most about how to solve the problem” (National Performance Review, 1993; 9).

The Measurement Question

How do we know if a public agency is doing a good job?

Much has been written about the technical (Suchman, 1967; Weiss, 1972) and political (Wildavsky, 1972) problems of evaluating public programs, public agencies, and public managers. Indeed, the measurement question can be asked from a number of different perspectives: How can public managers know if they are doing a good job? How can public agencies know if they are doing a good job? How can legislators and citizens know whether their agencies and managers are doing a good job? To answer these questions, we must define and measure what accomplishments might contribute to a good job. Thus, the big question about measurement appears to be relatively straightforward:

The measurement question: How can public managers measure the accomplishments of their agencies and of themselves?

The usual answer is to measure outcomes or impacts, not inputs or outputs. Consider a public-health program designed to assist pregnant women and their future children.

- ◆ Input measures include the number of public-health clinics providing this service, the number of public-health nurses working in these clinics, and the dollars spent on the program.
- ◆ Output measures include the number of women who participated in the program, the number of visits these women made to the clinics, and the prenatal instructions that they followed.
- ◆ Outcome measures include the number of healthy (and unhealthy) babies born to women who participated in the program.
- ◆ Impact measures include the difference between the number of healthy babies born to women who participated in the program and the number of healthy babies who would have been born to these women had they not participated in the program.

Given that the real objective of this program is not to employ nurses or rent clinic space—nor to have women visit clinics—but to actually improve the health of the infants born to these women, the input and output measures do not reveal

what we have really accomplished. The only way to do that is to examine the outcome and impact measures.

Unfortunately, whether a measure is an output or an outcome is not always obvious. Take the example of the birthweight of the new-born babies. Low birthweights are bad; they are associated with all sorts of short-term and long-term health problems. Thus, one outcome measure traditionally employed for prenatal programs is the percentage of babies who weigh more than 2,500 grams (or approximately 5.5 pounds),¹³ and one impact measure is how many more babies weighed over 2,500 grams than would have without the program. But is birthweight an outcome or an output measure? After all, how much a baby weighs at birth is not, itself, our real concern. The only reason we want to increase birthweights is because doing so decreases a variety of other problems. Nevertheless, because the correlation between low birthweights and other health problems is so high, the birthweight of babies is traditionally used as an outcome measure for prenatal programs.

This example makes the measurement question look trivial. There is not much political disagreement about wanting to make babies healthy (although there often is disagreement about how much ought to be spent to raise one baby's birthweight by one pound). Moreover, there is no scientific disagreement about the value of increasing birthweights.

Other public-policy efforts, however, are not so straightforward. How do you measure the value of a defense program, of a diplomatic initiative, or of an automobile drivers'-license bureau? Such questions are difficult to answer unless you can define the objectives that these public policies are supposed to accomplish—and unless you can determine how much the policy actually contributed to the objective. For example, the objective of a defense program might be to deter an attack on the United States, and the outcome might be that for the past five years there has, in fact, been no such attack. But what has been the impact? Has this defense policy really made any difference? Or would there have been no attack during the past five years even without the policy? And how would you know?

Further, this defense policy is not the only initiative—public or private—designed to prevent an attack on the United States. This is a blessing to the policy's managers—provided that there is no attack; they can benefit from these additional efforts and take credit for their impact. If an attack occurs, however, the managers of this defense policy will immediately claim: "It wasn't our fault. A lot of other people contributed to this problem. We didn't control all the incompetent diplomatic work of the Department of State. And that speech the president gave at the U.N.—it all but invited an attack."

The we-don't-control-everything excuse is a common response to outcome measurement: "You can hold us accountable for our outputs, but we don't control our outcomes." One of the basic reasons for measuring how well a public agency is doing is to hold the agency and its managers accountable for their work. And people do not like being held accountable for things that they do not control.

The *we-don't-control-everything* excuse is a

common response to outcome measurement:

*"You can hold us accountable for our outputs,
but we don't control our outcomes."*

If we accept the we-don't-control-everything excuse, however, we will never have any accountability. For no public agency (or private firm) controls all the inputs necessary to produce the desired outcomes. Even such a simple, service-delivery program as prenatal services for pregnant women can offer this excuse. After all, the effectiveness of the program depends both on the willingness of the women to visit the clinics and to follow the advice offered by its nurses. Thus, the measurement question is actually a question about responsibility.

The measurement/responsibility question: How can public managers help citizens define appropriate and realistic measures of accomplishments that the managers and their agencies should be responsible for achieving?

Most of the current debate in elementary and secondary education focuses on this question. Traditionally, the questions in education have been: What do we want our children to learn? And what kinds of tests should we use to measure, against these educational objectives, the accomplishments of students, schools, school districts, and states?

Thus, the kinds of tests we use to measure results are important. They need to reflect what we want school children to learn. And often it is not easy to design tests that can, in fact, measure whether children have learned what we were trying to teach.

This creates a further problem. If teachers are going to be evaluated by how well their students do on a test, teachers will teach what their students need to know to pass this test. In fact, when teachers, principals, superintendents, and other educators create tests and assert or imply that they are responsible for how their students perform on these tests, they influence—more powerfully than do any professed educational objectives—what students are taught.

There is, however, one more complication to this measurement question: What level of test results should teachers, principals, and school superintendents be responsible for achieving? After all, teachers, principals, and school superintendents do not control all the factors that go into what a child learns. Indeed, parents are much more important than teachers, and the home is much more important than school. So even if a perfect test could be designed, even if it could measure precisely how much of what we wanted taught the students actually learned, it is still not obvious whether the schools should be held responsible for getting their students to particular levels on those tests. What can a teacher do if the parents do not give a damn about their own children's education? And yet, if the

Even *if we know exactly what we want to accomplish, do we know any actions by anyone that will help accomplish it?*

validity of the we-don't-control-everything excuse is accepted, both the responsibility of the schools and the efficacy of their work are rejected.

Of course, some teachers, some principals, and some schools have not exploited this knowledge of the importance of parents as an excuse. Instead, they have exploited this knowledge to change their educational strategy: If parents are more important than teachers, then one of the key jobs of teachers is to make sure that parents are involved in their children's education.

In some ways, the educational example is easy too. We know that government action is not the primary contributor to the desired objective. This is not an uncommon condition. Fortunately, in education, we also know what a primary contributor is. Acting on this knowledge does require an imaginative redefinition of what a teacher and principal do. Contrary to what they were taught in their educational training, the most effective thing that teachers may do to improve the learning of their students may not take place in the classroom. Teachers' work with parents may be much more significant than teachers' work with students. Once that insight is accepted, however, it may not be unreasonable to hold teachers responsible for some measurable outcomes.

For other public agencies, however, we may know much less about the linkage between objectives and actions. Even if we know exactly what we want to accomplish, do we know any actions by anyone that will help accomplish it? If we do know something about some linkages, is it reasonable to expect those who work in a public agency to be able to activate those linkages? Can we hold a police chief responsible for the level of violent crime? Can we hold the administrator of the Environmental Protection Agency responsible for the quality of the air we breathe? Can we hold the director of the U.S. Weather Bureau responsible for the weather? What exactly are the measures of accomplishments that we should hold public agencies and their managers responsible for achieving?

Following the example of Hilbert (1902), Howard Wainer (1993) has defined 16 problems in educational measurement, such as "How do we correct for self-selection?" and "How can we combine response time with other measures of quality of response?" The measurement problem in public management, however, concerns more than the accuracy of the measurement or even the utility of the measurements for making good decisions. Rather, our measurement problem concerns the performance of public agencies; accurate data and valid metrics are not enough. Even useful data that facilitates decision making are not enough. We need to understand how to use these mea-

surements to improve performance. Thus, for public managers, the measurement question becomes:

The measurement question: How can public managers use measures of the achievements of public agencies to produce even greater achievements?

Micromanagement, Measurement, and Motivation

My three big questions are, of course, all linked. The micromanagement question is clearly connected to the one about motivation: When legislators, political executives, or staff and oversight agencies do not know how to motivate line-agency employees to achieve particular goals, they resort to micromanagement. Thus, answering the motivation question might help answer the one about micromanagement. Moreover, answering the measurement question may help answer both the micromanagement and motivation questions. As I have argued elsewhere (Behn, 1992), effective measurement of the consequence of a public agency's efforts can motivate the people working in that agency to do a better job and can, at the same time, provide the evidence necessary to build trust in the agency and thus break the micromanagement cycle.

Motivation and Micromanagement

If we could answer the big question about motivation, we might not need to devote as much time to answering the one about micromanagement. There are many reasons behind the proliferation of rules and regulations. One is that we do not know how to motivate people to do something right. So we resort to a second-best approach: constrain them from doing anything wrong. (Unfortunately, constraining people from doing anything wrong often simultaneously constrains them from doing anything right.) But if they knew more about how to motivate people, some legislators, political executives, and staff and oversight agencies might not feel so great a need to engage in micromanagement.

Measurement and Motivation

Being able to answer the measurement question would help to answer the motivation question. After all, if we can somehow measure how well we are doing, we have an important tool for motivating people and organizations to achieve those measures (Behn, 1991b; chap. 4; Locke and Latham, 1984). In fact, the public sector may choose to use artificial, performance evaluations in a futile effort to motivate public employees precisely because they lack the more useful motivational tool of clear, realizable goals.

Measurement and Micromanagement

Being able to answer the measurement question would help answer the micromanagement question as well. If the desired outcomes could be measured, legislatures might be much more willing to trust the executive branch; after all, they would then

have the ability to determine whether or not the executive was, in fact, actually achieving whatever objectives the legislature (or individual legislators) had laid out.¹⁴ Legislatures impose so many rules, in part because they cannot measure results, and in part because they do not know what results they want to measure. If they cannot determine whether the executive has produced the right outcome, they can at least determine if the executive has pursued that outcome in the right way.

Thomas Peters and Robert Waterman (1982; chap. 12) have argued that excellent businesses have “simultaneous loose-tight properties.” They are tight about what they expect their managers to achieve, but they are loose about how these managers can achieve it. That is, they give their managers firm, clear objectives, but then delegate to these managers a lot of discretion in how to achieve them.

In government, unfortunately, the situation is exactly the reverse. Government has simultaneous tight-loose properties. Legislatures are very loose about what they want their managers to achieve, but they are quite tight about the means that managers can use to achieve those loose objectives. Answering the big questions about micromanagement, motivation, and measurement may help convert government from its traditional reliance on tight-loose properties to a willingness to employ those simultaneous loose-tight properties that can contribute to excellence.

The Futile Search for *The Solution*

These big questions of public management will not be answered with a shout of “Eureka”—one sudden insight, one clever experiment, one brilliant paper that finally proves Fermat’s Last Theorem (Wiles, forthcoming). No single piece of public-management research will offer the kind of breakthrough that wins a Nobel Prize. The big questions of public management do not have a single answer—or even a single answer plus or minus 10 percent. “Scientific management” may have lost much of its intellectual stature, but its legacy lives on; people still search for the “one best way.” As Burns and Stalker wrote, however, “The beginning of administrative wisdom is the awareness that there is no one optimum type of management system” (1961; 125).

Indeed, any one of the three questions above can have multiple answers. Finding one solution to the micromanagement question does not preclude finding other solutions. (Nor will it be possible to prove that only one solution exists or that no solution exists.) Further, no single solution is apt to be inherently superior to another (although some solutions, or at least their advocates, may be more elegant than others). Different solutions will be more or less effective in different contexts, or when employed by different managers with different skills. Answering the motivation question for California does not guarantee that you have answered it for Colorado, or Connecticut, or Columbia, or Cameroon, or Cambodia.

Just because the big questions of public management will not have the same kind of answers as physics, or paleontology,

A search for answers to these (or other) big questions of public management will make no one instantaneously rich or famous. But the accumulative work of many scholars may provide some truly worthwhile answers—worthwhile as science and worthwhile as public management.

does not mean that they are not worth asking. It just means that they will have different kinds of answers and thus must be answered in different ways. It means that the questions will be answered only through an accumulation of evidence.¹⁵ For the answers to these questions are as much political as they are intellectual. An answer to the measurement question that appears elegant to theoreticians but is incomprehensible to public managers makes little progress. An answer to the motivation question that convinces scholars but rankles political executives will accomplish little. An answer to the micromanagement question that satisfies academics but fails to persuade legislators is no answer at all.

At the same time, a partial answer to the question may prove quite helpful. An answer to the measurement question that reveals how to measure how well social-service agencies are doing (and thus can motivate those who work in such social-service agencies) will be quite valuable, even if that answer has absolutely no validity when applied to defense or environmental agencies.

Thus, a search for answers to these (or other) big questions of public management will make no one instantaneously rich or famous. But the accumulative work of many scholars may provide some truly worthwhile answers—worthwhile as science and worthwhile as public management.

The Search for the Big Questions

I am not arguing that these are the only three research questions for public management scholars. I am not even arguing that these are the three most important research questions in public management. I am arguing that these three are among the most important research questions. Each one is significant and worthy of serious attention and study.

Other public-management scholars may find other questions more important. Great! My objective is not to dictate a research agenda for the field. Rather, my purpose is to get the field thinking about what questions ought to be at the very top of its research agenda.

So let the debate begin. What questions are really important? What questions should be the focus of public-management research? I hope that many scholars will develop their own lists of the big questions of public management. We ought to circulate, argue, defend, modify, and reargue these questions.

We ought to think seriously not just about data and methodology but also about questions—big questions. We ought to decide what they are, answer some of them, and revise the list. We ought to always be focusing our attention on these big questions. Then, when public-management scholars get together, we too will be discussing “The Big Questions of Public Management.”



Notes

In preparing this article, I benefited from conversations with Mark Abramson, Alan Altshuler, and Sanford Borins. I also received valuable comments on an early draft from Borins, Hale Champion, Robert Hartman, Marc Zegans, Peter Zimmerman, and two thoughtful referees. They should not, however, be held accountable for my inability, while standing obviously in deep left field, to understand that they were all screaming in unison for me to steal home.

- 1 To some of these questions, we have the “answer.” School children know that humans first came to the North American continent across the land bridge from Asia where the Bering Strait now lies; but we do not know when they came and whether they came in one or a few major waves or in a large number of much smaller migrations (Gutin, 1992). There is a growing belief that the dinosaurs (and approximately two-thirds of the other, existing species) were wiped out by a kind of long “nuclear winter” that enveloped the earth after a large meteor struck the Yucatan peninsula about 65 million years ago (Sharpton *et al.*, 1993). Others, however, have different theories (Kerr, 1993; Morell, 1993).
2. For one compilation of such big questions in various fields of science—from “Is Space Curved?” to “Why Are there Blood Groups?”—see Duncan and Weston-Smith (1977).
3. The National Performance Review (1993, Introduction) offers a similar story. The NPR’s version, curiously but predictably, almost never mentions the role of Congress. It is as if somehow all the “red tape” and “the systems of overcontrol and micromanagement” (p. 13) were created without any involvement by real people.
4. Others (Lowi, 1969) argue that the biggest problem created by legislatures comes not from their micromanagement but from their failure to set forth clear goals—not from their failure to give too detailed instructions but rather from their failure to provide instructions that are specific enough. This might, indeed, be a problem for liberal democracy, but it is less of a “management” problem. When confronted with multiple or conflicting goals, the public manager can choose on which of these goals to focus the agency’s energies (Behn, 1991b; 203-206). Indeed, when confronted with ambiguous legislative directives, public managers have an obligation to choose goals (Herring, 1936; Behn, 1992). That is called leadership.
5. Actually, I think that some pretty good explanations of the reasons behind the inherent distrust exist (Behn, 1991a). I just do not know of a single, succinct theoretical explanation of the sources. It will not take long, I suspect, before several people will tell me of their favorite explanation. Candidates include Wilson’s chapter on “Congress” (1989; 235-253).
6. There are still other ways to describe this question about micromanagement or trust or governance:
 The risk question: How can public executives be encouraged to take risks to achieve policy objectives rather than to play it safe to avoid criticism for making a mistake (Sylvester, 1992)?
 The reform question: How can we balance the conflict between political reform (designed to prevent corruption) and managerial reform (designed to encourage creative actions to achieve policy objectives)?
7. To answer the entrepreneur variant of this question, Diver (1982) suggests: “We must study entrepreneurial public managers—not as engineers who have somehow gone wrong, but as self-conscious entrepreneurs.... [W]e need case studies that illuminate the skills uniquely required for entrepreneurship.... [W]e need studies that explore the social consequences of entrepreneurial behavior—the connection between personal reward and social outcome, the impact of entrepreneurship on govern-

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- mental performance....” For an example of the first two kinds of studies, see Behn (1991b).
8. For a firm, these underlying assumptions may not be as weak. The stockholders know what they want the firm’s managers to do: make money. The stockholders do not care about vision, or empowerment, or wellness programs, or any other nice things that might make an organization productive—except to the extent that these things help achieve their single objective of making money. The relationship between stockholders and managers is not complicated by the subtleties of unknown or ill-formulated objectives. And the stockholders do not really care about means. They invested in the firm for only one reason: to make money.
 And yet, even this assumption is not quite true. Some cranks invest in a firm (buy a few shares of stock) not to make money at all, but to force the firm to pursue a broader set of objectives, or to pursue the single objective of making money in particular (and presumably socially desirable) ways. Some people even make money organizing mutual funds from stocks of firms that pursue explicit social objectives beyond making money.
 9. Economists are not the only social scientists who emphasize control. Hugh Hecló (1977; 5, 1), a political scientist, writes about “the problems of political control of the bureaucracy,” of “the struggle to control the bureaucracy” by “the President, his appointees, and high-ranking bureaucrats.”
 10. I know, you can always add another dimension to the social-worker’s utility function—the do-good dimension—and then model that individual’s behavior using this new utility function with all the proper coefficients. This ability to continually add new dimensions to the utility function is what makes economics so “powerful” and simultaneously so trivial.
 11. Economists worry about “adverse [self-]selection” by employees. But there can be “beneficial [self-]selection” too. For an example, see Katzenbach and Smith (1993; 33).
 12. Another assumption behind this big question about motivation is that, if people have a role in deciding what goals to pursue and how to pursue them, they will work harder to pursue these goals.
 13. Oregon uses as one of its benchmarks for healthy babies and toddlers the percentage of children born with birthweights over 2,500 grams. Oregon’s objective is to increase this percentage from 95 percent in 1992 to 97 percent in 2000 and 98 percent in 2010. Oregon also keeps track of the “percentage of babies whose mothers received adequate prenatal care (beginning in the first trimester)” and seeks to increase this output measure from 77 percent in 1992 to 97 percent in 2000 and 98 percent in 2010 (Oregon Progress Board, 1992; 27). As one of the “Minnesota Milestones” that “Minnesotans will be healthy,” this state uses the percentage of low birthweight babies (under 2,500 grams). Minnesota seeks to reduce this from 5.1 percent in 1990 to 3.5 percent in 2000 and 2.5 percent in 2020 (Minnesota Planning, 1992; 20).
 14. This assumes, of course, that a majority of legislators can agree on what objectives they want the agency to accomplish. If not, they still might be able to agree on *how* the agency should accomplish any objectives, and thus they still might micromanage.
 15. Okay, that is how it happens in physics, too (Kuhn, 1970). And it also holds true for paleontology. Gould (1989; 79) writes: “[I]ntellectual transformations often remain under the surface. They ooze and diffuse into scientific consciousness, and people may slowly move from one pole to another, having never heard the call to arms.”

References

- Adair, Robert K., 1987. *The Great Design: Particles, Fields, and Creation*. New York: Oxford University Press.
- Allison, Graham T., 1971. *Essence of Decision: Explaining the Cuban Missile Crisis*. Boston: Little, Brown.
- Austin, Robert and Patrick Larkey, 1992. "The Unintended Consequences of Micromanagement: The Case of Procuring Mission Critical Computer Resources." *Policy Sciences*, vol. 25, no. 1 (February), pp. 3-28.
- Barzelay, Michael, 1992. *Breaking Through Bureaucracy: A New Vision for Managing in Government*. Berkeley, CA: University of California Press.
- Beck, Robert C., 1990. *Motivation: Theories and Principles*, 3rd ed. Englewood Cliffs, NJ: Prentice-Hall.
- Behn, Robert D., 1991a. "Innovation and Public Values: Mistakes, Flexibility, Purpose, Equity, Cost Control, and Trust." Paper presented at a conference on The Fundamental Questions of Innovation, Duke University, Durham, NC (May 3-4).
- _____, 1991b. *Leadership Counts: Lessons for Public Managers from the Massachusetts Welfare, Training, and Employment Program*. Cambridge, MA: Harvard University Press.
- _____, 1992. "Bottom-Line Government." Paper presented at the Thirteenth Annual Meeting of the Association for Public Policy Analysis and Management, Denver, October 30.
- Browder, F., 1974. "Mathematical Developments Arising from the Hilbert Problems." *Symposia in Pure Mathematics*, vol. 28.
- Burns, Tom and G.M. Stalker, 1961. *The Management of Innovation*. London: Tavistock Publications.
- Cann, Rebecca L., Mark Stoneking, and Allan C. Wilson, 1987. "Mitochondrial DNA and Human Evolution." *Nature*, vol. 325, no. 6099 (January 1), pp. 31-36.
- DiIulio, John J., Jr., ed., 1994. *Deregulating the Public Service: Can Government Be Improved?* Washington, DC: The Brookings Institution.
- Diver, Colin S., 1982. "Engineers and Entrepreneurs: The Dilemma of Public Management." *Journal of Policy Analysis and Management*, vol. 1, no. 3 (Spring), pp. 402-406.
- Duncan, Ronald and Miranda Weston-Smith, eds., 1977. *The Encyclopaedia of Ignorance*. Elmsford, NY: Pergamon Press.
- Ferris, Timothy, 1988. *Coming of Age in the Milky Way*. New York: William Morrow.
- Flamsteed, Sam, 1992. "How Big Is the Universe?" *Discover*, vol. 13, no. 11 (November), pp. 48-53.
- Goodnow, Frank J., 1900. *Politics and Administration: A Study in Government*. New York: Russell & Russell.
- Gould, Stephen Jay, 1989. *Wonderful Life: The Burgess Shale and the Nature of History*. New York: W.W. Norton.
- Gutin, Jo Ann C., 1992. "Who Peopled the Planet?" *Discover*, vol. 13, no. 11 (November), pp. 108-113.
- Hecko, Hugh, 1977. *A Government of Strangers: Executive Politics in Washington*. Washington, DC: The Brookings Institution.
- Herring, E. Pendleton, 1936. *Public Administration and the Public Interest*. New York: McGraw-Hill.
- Herzberg, Frederick, 1968. "One More Time: How Do You Motivate Employees?" *Harvard Business Review*, vol. 46, no. 1 (January-February), pp. 53-62.
- Hilbert, David, 1902. "Mathematical Problems." *Bulletin of the American Mathematical Society*, vol. 8, pp. 437-479.
- Kaufman, Herbert, 1981. *The Administrative Behavior of Federal Bureau Chiefs*. Washington, DC: The Brookings Institution.
- Katzenbach, Jon R. and Douglas K. Smith, 1993. *The Wisdom of Teams*. Boston: Harvard Business School Press.
- Kerr, Richard A., 1993. "A Bigger Death Knell for the Dinosaurs?" *Science*, vol. 261, no. 5128 (September 17), pp. 1518-1519.
- Kuhn, Thomas S., 1970. *The Structure of Scientific Revolutions*. Chicago: University of Chicago Press.
- Levinson, Harry, 1973. *The Great Jackass Fallacy*. Boston: Harvard University Graduate School of Business Administration.
- Li Tianyuan and Dennis A. Ertler, 1992. "New Middle Pleistocene Hominid Crania from Yunian in China." *Nature*, vol. 357, no. 6377 (June 4), pp. 404-407.
- Locke, Edwin A. and Gary P. Latham, 1984. *Goal Setting: A Motivational Technique that Works*. Englewood Cliffs, NJ: Prentice-Hall.
- Lowi, Theodore J., 1969. *The End of Liberalism*. New York: W.W. Norton & Company.
- Maslow, Abraham, 1943. "A Theory of Human Motivation." *Psychological Review*, vol. 50 (July), pp. 370-396.
- McGregor, Douglas, 1960. *The Human Side of Management*. New York: McGraw-Hill.
- Messadié, Gerald, 1991. *Great Scientific Discoveries*. Edinburgh, England: Chambers.
- Minnesota Planning, 1992. *Minnesota Milestones: A Report for the Future*. St. Paul, MN: Minnesota Planning.
- Moe, Terry M., 1984. "The New Economics of Organization." *American Journal of Political Science*, vol. 28, no. 4 (November), pp. 739-777.
- Mook, Douglas G., 1987. *Motivation: The Organization of Action*. New York: W.W. Norton.
- Morell, Virginia, 1993. "How Lethal Was the K-T Impact." *Science*, vol. 261, no. 5128 (September 17), pp. 1518-1519.
- National Academy of Public Administration, 1992. *Beyond Distrust: Building Bridges Between Congress and the Executive*. Washington, DC: National Academy of Public Administration.
- National Commission on the State and Local Public Service, 1993. *Hard Truths/Tough Choices: An Agenda for State and Local Reform*. Albany, NY: The Nelson A. Rockefeller Institute of Government.
- National Performance Review, 1993. *From Red Tape to Results: Creating a Government that Works Better and Costs Less*. Washington, DC: U.S. Government Printing Office.
- Oregon Progress Board, 1992. *Oregon Benchmarks: Standards for Measuring Statewide Progress and Government Performance*. Salem, OR: Oregon Progress Board.
- Osborne, David and Ted Gaebler, 1992. *Reinventing Government: How the Entrepreneurial Spirit Is Transforming the Public Sector*. Reading, MA: Addison-Wesley.
- Peters, Thomas J. and Robert H. Waterman, Jr., 1982. *In Search of Excellence: Lessons from America's Best-Run Companies*. New York: Harper & Row.
- Rohrlich, Fritz, 1987. *From Paradox to Reality: Our Basic Concepts of the Physical World*. Cambridge: Cambridge University Press.
- Rowan-Robinson, Michael, 1977. "Galaxies, Quasars and the Universe." In Ronald Duncan and Miranda Weston-Smith, eds., *The Encyclopaedia of Ignorance*. Elmsford, NY: Pergamon Press, pp. 56-57.
- Sharpton, Virgil L., Kevin Burke, Antonio Camargo-Zanoguera, Stuart A. Hall, D. Scott Lee, Luis E. Marín, Gerardo Suárez-Reynoso, Juan Manuel Quezada-Muñeton, Paul D. Spudis, Jaime Urrutia-Fucugauchi, 1993. "Chicxulub Multiring Impact Basin: Size and Other Characteristics Derived from Gravity Analysis." *Science*, vol. 261, no. 5128 (September 17), pp. 1564-1567.
- Spielberg, Nathan and Bryon D. Anderson, 1987. *Seven Ideas That Shook the Universe*. New York: John Wiley & Sons.
- Suchman, Edward, 1967. *Evaluative Research*. New York: Russell Sage Foundation.
- Sylvester, Kathleen, 1982. "Risk and the Culture of Innovation." *Governing* (October), pp. 46-50.
- Wainer, Howard, 1993. "Measurement Problems." *Journal of Educational Measurement*, vol. 30, no. 1 (Spring), pp. 1-21.
- Weinberg, Steven, 1993. *The First Three Minutes: A Modern View of the Origin of the Universe*, updated ed. New York: Basic Books.
- Weiss, Carol, 1972. *Evaluation Research: Methods for Assessing Program Effectiveness*. Englewood Cliffs, NJ: Prentice-Hall.
- Wildavsky, Aaron, 1972. "The Self-Evaluating Organization." *Public Administration Review*, vol. 32, no. 5 (September/October), pp. 509-520.
- Wiles, Andrew, forthcoming. "Modular Forms, Elliptic Curves and Galois Representations." *The Annals of Mathematics*.
- Wilson, James Q., 1989. *Bureaucracy: What Government Agencies Do and Why They Do It*. New York: Basic Books.
- Wilson, Woodrow, 1887. "The Study of Administration." *Political Science Quarterly*, vol. 2 (June 1887).
- Womack, James P., Daniel T. Jones, and Daniel Roos, 1990. *The Machine That Changed the World*. New York: Rawson Associates.