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Bardach, Eugene

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Management**

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Generic Models in the Study of Public Management

Eugene Bardach

Graduate School of Public Policy

University of California, Berkeley

Presented at the 1993 Research Conference of the Association for Public Policy Analysis and Management, Washington, D.C.

Generic Models in the Study of Public Management¹

Eugene Bardach

Graduate School of Public Policy

University of California, Berkeley

The idea of “generic policy instruments,” such as vouchers, command-and-control regulation, and tax expenditures seems innocent enough (Weimer and Vining, 1989; Salamon, 1989). The “policy instruments” part of this idea surely is rather innocent, for there is not much controversy over what they are or whether it would be useful to improve our understanding of how they work.² But “generic” is not at all innocent. It is a concept of unusual power, as befits a word whose etymology is linked to “generative” and to “general.” It is a concept that promises to help relieve three of the problems that have long troubled public management research, namely, the difficulty in forging links between theoretical knowledge and practical knowledge (Brunner, 1990), the lack of an overarching research agenda (Lynn, 1993), and the perplexity over what it means to do methodologically responsible case studies.

This paper proposes that we develop a portfolio of “generic models” of operating systems that produce outputs of interest to public management. In Section I, I examine the way in which engineering professionals use and construct such models.³ In Section II, I explore the nature of the phenomena that underlie such models, namely, systems of production. I attempt to draw analogies between production processes in engineering and production processes in public management. Section III provides an example of a generic public management model based on research I have recently completed on the implementation of a welfare-to-work program. Section IV addresses certain philosophical issues connected with the creation and validation of generic models. It serves as an introduction to Section V, which discusses empirical strategies in the selection and interpretation of “specimens” of generic phenomena.

I. Generic Models in Engineering

How generic models are used in engineering can be gleaned, at least in part, by studying a “manual of practice.” I have therefore consulted what I take to be a representative such manual, the two-volume *Design of Municipal Wastewater Treatment Plants*, published in 1992, and prepared by a joint task force of the Water Environment Federation and the American Society of Civil Engineers (hereafter, the WTP manual). I have also consulted a respected engineering text

¹ Presented at the 1993 Research Conference of the Association for Public Policy Analysis and Management. I wish to acknowledge the helpful criticism, on earlier versions of this work, from Michael Barzelay, John Ellwood, Mark Kleiman, Martin Levin, Michael O'Hare, Craig Thomas, David Weimer, Sorin Winter, and Marc Zegans. They bear no responsibility for the remaining deficiencies, however.

² For some new inventions in the line, see Weimer, 1992. For other conceptions of generic policy instruments, see Elmore, 1987.

³ A very early proponent of engineering as a paradigmatic profession for public management was Mark Moore, in papers prepared for internal use at the Kennedy School of Government.

entitled *Process Modeling*, by Morton M. Denn, which contains useful comments on the logic of modeling in general as well as a chapter on wastewater treatment plants in particular.⁴

The heart of the WTP is an aerator-plus-settler system. Microorganisms digest waste in the aerator. The resultant "mixed liquor" passes into the settler where the sludge component settles and thickens; relatively clear water ("supernatant") remaining above the sludge is discharged. The settled sludge is divided into one flow recycled to the aerator, in order to conserve the active (digesting) microorganisms, and a second, much smaller, flow that becomes available for final dewatering and removal from the plant. The rate of flow and the volume of the recycle stream affects several processes simultaneously: sludge thickening in the settler, clarification of the discharge, and digestion in the aerator. Design and control strategies must balance the effects on these processes.

An early chapter in the WTP manual depicts in graphic form a hypothetical "processing schematic for a simple, small plant," (p. 99) defined largely in terms of the nature and sequence of the functions it performs. It highlights: initial sedimentation, aeration, disinfection, digestion (by microorganisms in the sludge), dewatering, and beneficial land application of sludge. An accompanying table reports the steady-state mass balances of various pollutants at each of thirteen processing points in a simulated plant given hypothetical, but reasonable, assumptions about the operating efficiencies of each component subsystem.

The combination of a schematic diagram, results of an illustrative simulation, and a brief verbal description such as the one in the above paragraph (that I created), appears often in the WTP manual, virtually whenever another subsystem or lesser component is introduced. It is the full-scale version of what I shall mean by a "generic model." More abbreviated versions, omitting the simulation or the schematic, also appear.

Qualitative though they can be in most respects, the generic models in use always incorporate, implicitly if not explicitly, at least one real quantitative parameter: performance that at least exceeds the minimum required to meet some standard. In the case of the WTP as a whole, for instance, the discharged effluent meets national water quality standards. Exactly whose conception of acceptable performance is used to anchor the model can vary, however. Although governmental standards do provide one possible anchor, some WTP models move towards a higher standard based on professional norms or the preferences of the model builder.

The generic model serves as a platform for the construction of more quantitative models that are in turn used "to enable computation of the expected behavior of the process for a range of inputs and conditions" (Denn, 12). Denn's text discusses model applications in two general domains, design and operational control. The expected behavior of interest includes, in Denn's discussion, cost minimization and vulnerability to upset or breakdown. In the WTP manual odor control and ease of operation also loom large.

The value of a generic model and its more highly specified derivatives is to facilitate trial-and-error exploration of alternative designs or control strategies. For example, Denn carries out a

⁴ Denn is Professor of Chemical Engineering at the University of California at Berkeley. I am grateful for his help, but all errors of fact and interpretation are my responsibility.

sensitivity analysis of plant costs to varying combinations of sludge age, volatile suspended solids level in the aeration tank, and degree of solids removal in the primary settler (280, 285-290). He concludes that cost is minimized when there is no removal of primary solids at all, and that a wide range of combinations of sludge age and solids levels can bring costs down to very close to the minimum.⁵ Denn also analyzes conditions of vulnerability or very poor performance. He uses a series of simulations, for instance, to show that a WTP is very sensitive to the rate at which solids are recycled into the aeration basin from the secondary clarifier. His analysis shows the reason for the unusual sensitivity of the process to be that it is part of a feedback process which causes the plant as a whole to “exhibit much greater dynamical sensitivity and longer response times than the individual elements” (290).

A generic model can be used to suggest qualitative as well as quantitative alternatives. In the hypothetical small plant, for instance, the designer can choose between intermittent or continuous recycle of the activated sludge back into the aerator. The generic model shows that intermittent recycle is “operationally convenient...[and] a practical necessity” to maintain adequate velocities in pipelines (102), but also that the sudden pollutant load of this intermittent recycle stream may overwhelm the digestion process and degrade the final effluent.

II. Understanding Production Systems

It is important to distinguish between the model and the phenomenon being modeled. One of the reasons that the generic models approach I have been discussing so far has proven successful in engineering is that it reflects the nature of production systems. Understanding production systems -- whether in engineering or in public management -- is not quite the same as understanding other kinds of social and natural phenomena. Although this is not the place for a full-scale discussion of all the similarities and differences between production systems and other systems, seven points about production systems bear mentioning.

In engineering, to understand how a production process works is, at one level, to understand its “technology.” This generally means understanding how systematically organized operations are able to transform certain materials in such a way as to cause predictable consequences, e.g., aerating microbially active waste so as to transform it into sludge plus clear water. At this “technical” level, “understanding” invokes knowledge about fundamental physical laws, like the conservation of matter, and less fundamental “constitutive relations,” such as the proportionality of the force of a spring to its extension.⁶

Now, the technologies available in engineering, being rooted in the physical world, are much more definable, replicable, and reliable than their counterparts in the predominantly symbolic world of human interactions. Indeed, we use the term “technology” at our peril in this more loosely constructed symbolic world. A softer term is needed, though one that also conveys

⁵ Both sludge age and VSS levels are functions of holding time in the aerator before discharge into the clarifier and the rate of recycle from the clarifier back into the aerator tank. Size of aeration basin and clarifier limit holding time; ideally, therefore, the effect of size on operating cost, and therefore on total cost, should be taken into account in the design stage.

⁶ Denn, 1986, p. 9. Denn writes that constitutive relations “depend on the particular materials and circumstances of use...i.e., the constitution of the system...” (Ibid.), and hence the term “constitutive.”

the ideas, implicit in "technology," of purposiveness, complexity, systematic functional organization, and causal efficacy. For some purposes "strategy" might do, but my preferred candidate is "design".

The concept of "design" is not unfamiliar in policy analysis and management.⁷ It is discussed as a verb, "designing," as well as a noun. A recent paper by Weimer (1993) provides an ample bibliography. Writings about the generic policy instruments mentioned at the outset are, in effect, about the performance potential implicit in their technical designs -- in this case, "design" as a noun. It would also be possible to write about more specialized generic instruments as embodying certain designs, e.g., the design implicit in a generic restaurant sanitation program or a generic system for establishing eligibility to bid on government contracts.

It is also possible to think about "practices" and "strategies" as "designs." The practice of "management-by-objectives," for instance, is a complex system with many interdependent elements (goal-setting processes, communications processes, reporting processes, review processes, etc.) linked by an integrating design. Michael Barzelay's vision of a "post-bureaucratic paradigm" of public administration, in his *Breaking Through Bureaucracy* (1992) is a very comprehensive set of strategies and practices that ideally reinforce one another. Or consider a strategy for introducing a change of mission into a public sector bureaucracy. Insofar as one might have a strategy for doing this, it might be built on the idea of stringing together a sequence of "small wins" rhetorically and substantively organized around a vision statement, a sequence that would cumulate substantively, inspire enthusiasm in onlookers, reassure doubters, locate the sources of residual opponents, recalibrate the possible end-points, and so on (Weick, 1984).⁸

A "technology" or "design" may be decomposed into a central "generic" core and a less central array of potential "variants." One can often see these variants as customized versions of the generic technology or design that are especially adapted to particular local conditions, e.g., a WTP having to operate at a certain scale, or in a certain climate, or minimizing the use of unionized employees. With respect to production systems in public management we often have, in addition to variants adapted to such relatively impersonal local conditions, variants that depend on the local dominance of particular political or personal interests.⁹ A generic regulatory system, for instance, can be transformed into a variant that serves the interests of the regulated parties or into one that serves the interests of economic efficiency, to name just two of many possibilities.

A second level of understanding "how a generic design works" involves knowing how to design "better" variants. If technical understanding of how a system design works is one type of understanding, a second important type aims at understanding how to create "better" variants --

⁷ Herbert Simon recommended an expansive role for the concept of design in his 1969 Compton lectures published as *The Sciences of the Artificial*.

⁸ It is possible to conceptualize the dynamic aspects of practice and strategy as belonging to the analysis of control rather than of design and to keep the two analyses quite separate, as is possible and apparently desirable in engineering. However, because management theory for all intents and purposes has no theory of dynamics -- the rhetoric of book and article titles notwithstanding -- I do not make the distinction. Also, omitting the distinction in this paper shortens and simplifies exposition.

⁹ Some scholars might wish to substitute the term "preferences" for "purposes." I use "purposes" because it does not connote the large set of assumptions familiar from economics and including, most problematically, stability.

and making allowance for disagreements among observers as to what might constitute "better." To move towards this second type of understanding, we will often wish to ask a question like this: "Given that the system works, technically, in this general way, what are the ways in which we can push it towards its intrinsic performance limits?"

To answer such a question it is necessary to map alternative qualitative means of producing the same general result, e.g., in the WTP case striking a slightly different balance among the several processes which the recycle rate can affect, or considering the substitution of one method of odor control for another. Normally, as these examples suggest, the approach would be to look for ways in which qualitative substitutions of various sorts might be possible and desirable. Additionally, it is possible to look for synergistic possibilities.

Where does the design engineer find these possible alternatives? The short, and admittedly rather incomplete, answer is that many of them are implied in part by the requirements of the core technology of the production system itself. These requirements not only constrain the system, they also imply the search strategies the design engineer might profitably use for filling in the large number of design details.

This theoretical lens helps explain why the seemingly unstructured trial-and-error learning that Robert Behn calls "groping along," as practiced by highly effective managers like Ira Jackson as head of the Massachusetts Department of Revenue, might actually work (Behn, 1988). Although neither Behn nor Jackson recognizes it, there is in fact a set of generic design requirements that underlies nearly all income tax collection in the United States. Suffice it to say that, working within this design, the tax agency must communicate to the taxpayers an image that it is fearsome, omniscient, honest, and fair. Any action that enhances any of these four aspects without damaging another (and is not financially costly to implement) represents a plus. And any action that can enhance more than one simultaneously is even better. These are fairly simple guidelines for "groping along" successfully in the realm of tax administration. The specific practices that Jackson and his associates invented in Massachusetts are a credit to their ingenuity, of course; but they are also a credit to the underlying structure of possibilities afforded by the nature of the task at hand.

Of course, customization of a generic design can produce bad results as well as good, and the array of generic variants logically includes not only the "best" and the "good" but the "worst" and the "bad." Hence, we should be analyzing the generic design for its characteristic vulnerabilities as well as its high-performance potential, and asking questions like: "Given that the system works in this general way, what are the weaknesses that would allow it to fail, collapse, or suffer extreme distortion of its primary purposes?" And of course, "If thus-and-such are the generic vulnerabilities, what are the generic modes of compensating for these? What preventive measures, or remediating measures after the fact, might be generically useful?" In the domain of public management, such questions would lead us often to think about vulnerabilities to capture or distortion by special interests, abuse and corruption, delays due to the multiplication of decision points, and the like.¹⁰

¹⁰ See Bardach, 1977, for a partial catalogue of vulnerabilities suspected of many government programs and occasional suggestions as to how they might be offset.

Design analysis uses a problem-solution schema. The building blocks of design analysis are problems intrinsic to the generic technology or design and their associated sets of potential solutions.

For conceptualizing the deep structure of such problems, there is nothing like theory, especially when “the problem” is to move closer to a potential optimum which can be identified only by theory and not by simple observation or common-sense reasoning. The design analysis of generic policy instruments in Weimer and Vining (1989), for instance, is based in their understanding of how each of them compensates for some sort of market failure. Ostrom’s analysis, in *Governing the Commons* (1990) of how locally managed, and largely informal, social groups can successfully prevent the overexploitation of common property resources is built, in part, on the prisoner’s dilemma game and two other related models. Gary Miller’s *Managerial Dilemmas* (1992) is a superb exposition of game-theoretically derived defects in incentive structures within organizations that can only be remedied by organizational culture and leadership.

Rational-actor theories are not the only useful source of problem conceptualizations. John DiIulio’s account of the “control model” as used in the Texas prison system to prevent riots and inmate-on-inmate crime can also be construed as a problems-and-solutions “design analysis” in my sense of the term. DiIulio’s conception of the challenge is based on a theory, unfortunately not explained in much detail, of how the sheer density of inmate contacts increases the probability of “criminalistic associations among inmates -- to plot an escape, plan some violence, deal in contraband, or engage in some other form of misconduct.” (108) In the Texas control model, this implies preventing frequent, numerous, or prolonged contacts among inmates. The model accomplishes this function through devising numerous rules about prisoner movements and conduct and training staff to enforce them assiduously.¹¹

Surely one of the most sophisticated pieces of design analysis in the public management literature is Jerry Mashaw’s *Bureaucratic Justice: Managing Social Security Disability Claims* (1983). Mashaw uses various empirical and normative theories, combined with facts about the irreducible uncertainty of evidence about individual claims, to frame the basic problems. The Social Security Administration’s design solution is very complex and includes, among other features, sequential decision-making and a self-conscious engineering of the error structure. Barzelay, in a lengthy appreciative essay (1993), has characterized the system analyzed by Mashaw as having a “family resemblance” to -- in my language, having the generic design of -- “mass adjudication” and argues that Mashaw’s design analysis could inform judgments about other systems of this type.

Functions are more fundamental than features. In constructing generic models of production systems, functions are more fundamental than features. As we noted above, the plant-level schematics in the WTP manual begin with functions such as sedimentation, aeration, and digestion. Only as the discussion proceeds to lower levels of detail do the particular structural features emerge, e.g., separators and reactors. These structural features are in turn analyzed in terms of the functions they perform -- separators remove suspended solids, and

¹¹ The basic doctrine of the control model was epitomized as “every inmate must do his own time.” (DiIulio, 1987, p. 108)

reactors “oxidize, reduce, solubilize, immobilize, or physically condition their contents and create gaseous products.” The alternation of function and feature through descending levels of detail is characteristic of the entire WTP manual.

One obvious reason for this approach is that features are to functions as means are to ends, and ends must be stipulated before a discussion of the means can make sense. But there is more to the matter. Choices of structural features in effect represent design solutions to particular functional problems, e.g., as a fine-pore diffuser is a design solution to the problem of efficiently aerating the large quantity of biomass in the WTP. To avoid premature judgment about preferable solutions, therefore, it is desirable not only to specify functions before features but to take care to ban unintended feature specifications from the functional description. In addition, with the feature-function distinction in mind, it is possible to focus effort on estimating the relative empirical values of alternative structural solutions, e.g., what is the least costly device for raking sludge in the primary clarifier, what method of thermal destruction of sludge poses the greatest risk to air pollution control equipment, what method of chemical treatment best suppresses hydrogen sulfide odors.¹²

Of course, any particular design decision narrows the scope for any subsequent decision. Nevertheless, no matter how narrowed a design problem has become by virtue of prior decisions, there is always some room to apply the principle that some sort of functional analysis should precede, and be kept separate from, the analysis of features.¹³

The language of feature and function is adaptable to the public management context, although the intangible nature of many programmatic or organizational “features,” e.g., procedural rules or reporting relationships, can present problems. Taking a cue from engineering, it will probably help to keep the description of “functions” as close as possible to the connotation of operating processes. To do so I will use the linguistic device of describing them with gerunds:

-- “Monitoring compliance with regulatory rules is an important function in a regulatory system.”

-- “Reassuring taxpayers that the tax collection system is honest and efficient is a useful function in a democratic system of tax administration.”

-- “Protecting the procurement process from nepotism and other forms of corruption is an indispensable function in a procurement system.”

And here is how “features” are related to “functions”:

¹² As I have learned from interviewing architects, the approved design approach is the same in architecture. The idea is to start by describing “the program” -- that is, the list of functions that the built structure and its differentiable components will have to perform -- and to be very careful not to contaminate this description with implied structural solutions. Hence “food preparation” is initially acceptable whereas “kitchen” may not be.

¹³ For an inspiring application of functional analysis in cognitive psychology and in cultural anthropology, see Tooby and Cosmides, 1992.

-- "Inspectors are one feature in a regulatory system that can carry out compliance monitoring."

-- "Public prosecution of high-profile tax evaders is one of several features that contributes to reassuring taxpayers."

-- "Rules forbidding sole-source procurement for large items are one feature that helps protect the procurement process."

A generic design creates a generic environment. It is obvious that the demands of a local environment propel the evolution of a generic production system towards one or another variant form. It is less obvious that causal forces run the other direction as well: a generic production system, in public management though not in engineering, also creates its generic environment. It does this because it presents a generic set of opportunities and threats to various interests around which these interests mobilize and compete. The competition is often over exactly which features become incorporated into a design; and the stakes are as varied as access to possible contracts, the security of jobs, the tilt towards alternative policy objectives, risks to professional status, and the like.

Exactly how the reciprocal dynamics between a generic system design and its environment might produce alternative variants should of course be a central research concern. This line of research should focus, in particular, on what can happen when would-be system designers or improvers, such as legislators or political appointees, attempt to steer the evolution of a system by rationalistic means. Rationalistic steering can work up to a point, of course, but would predictably run into hazards which research could usefully identify and analyze. The existing literature on generic policy instruments has made a useful contribution in this regard, as has much of the literature on implementation processes.

For any generic function, it is possible to identify a set of alternative but commonly used features to accomplish it. Consider, for instance, a generic regulatory design. It requires the bringing of information about compliance or noncompliance to the attention of the regulatory agency. Several alternative features are part of the set available to perform this function, including: the agency's inspectors; self-reporting by the firm; complaints from employees or consumers; reports from professional associations and other such third-parties. It is possible to identify analogous sets of strategies intended to realize some generic design variant.

Such sets are intrinsic parts of generic systems and, as such, deserve to be explicated by social scientific efforts aimed at understanding how such systems work. It happens that such a set also constitutes a checklist that might be used by practitioners or advisers to practitioners confronting a particular situation or problem. This is probably the most important linkage between social scientific knowledge and practical knowledge that the generic models approach can contribute.

Now, the term "checklist" enjoys a dubious standing among students of policy analysis and public management. It is often preceded by "mere" and may be thought of as an inferior substitute for a reliable and unique answer to the question, "What works under such-and-such

conditions?" However, the preceding discussion should have shown that the values at stake in answering the question "What works?" are too various to permit a unique answer. A checklist of options may often be the only responsible answer to such a question.¹⁴

III. *One Hundred Generic Design Solutions*

If the public manager were to be as well served by public management scholars as wastewater treatment plant engineers are served by their own professional research community, the public manager confronting a complex situation could reach for a manual entitled "One Hundred Generic Design Solutions to Routine and Extraordinary Problems." He or she could look up the problem situation and find an entry of five or so pages. The entry would furnish: an interpretation of the essential structure of the problem; explications of alternative generic design solutions that would provide a minimally satisfactory outcome; the probable costs associated with each; and warnings about the ways in which each of them is vulnerable to breakdown or backfire. It would also contain information about how one might push the design solution towards some optimum or -- better yet, and in consideration of the fact that different users will have different conceptions of social value -- towards two or three different optima.

A special feature of this manual would be information about the nature of the personal risks, and the levels of personal effort, that might be required by a manager opting for any particular design solution. The manual should also use telling examples drawn from field experience.

Specialized design manuals could also be prepared for specialized classes of situations. For instance, there might be a manual dealing with problems of interorganizational cooperation, a manual for managers of grants programs, a manual for running welfare-to-work programs, and so on.¹⁵ Based on work I have done recently in this last area, a study of how local Department of Social Services managers of JOBS program sites might increase program productivity (Bardach, 1993a), Table I is a sketch of material that might be incorporated into a manual entry describing a "high-expectations" program design.

TABLE I

High-Expectations Program Design

Technical problem: It may take a lot of effort, and in some cases a bit of courage, for welfare recipients to overcome the barriers to finding and holding onto a job. How motivate this effort?

Design functions and features: This design is built on the idea that expectations are motivating and that there is room to increase the expectations of many program participants. Key design functions are:

¹⁴ For an earlier attempt on my part to conceptualize the logic of creating checklists, see Bardach, 1987.

¹⁵ All such manuals, of course, should be shelved next to the set of kindred manuals on policy design.

-- Providing reasons other than short-term income improvements for clients to expect improvements in their lives as a result of leaving welfare for work. This is necessary because the relatively low-wage jobs that are available to most program participants may not improve their financial situation relative to continued receipt of welfare and related benefits.

-- Bolstering clients' expectations about their own worth and abilities, as substantial proportions of welfare recipients have low self-esteem and have experienced failure in many aspects of their lives. Peer support groups are one way to do this. Commercially available training videos are another.

-- Ensuring that job opportunities are available for clients who successfully complete participation in the program. It may be necessary to assign specialized job developers to this function. If the paying-job market is thin, it may be necessary to provide a back-up in the form of public and nonprofit "work experience" jobs.

-- Converting the taxpayer-oriented demands for work as fulfilling the client's "responsibility to society" into work as a self-fulfilling way to "take responsibility for your own life."

-- Making use of the JOBS program's disciplinary rules about participation as a vehicle for the development of work-compatible habits and attitudes. This and the previous function make use of the fact that taxpayer-oriented features of the JOBS program can easily be converted to client-oriented features. More precisely, they can be structured to perform functions for both sets of interests. More importantly, in the absence of a concerted effort to make this happen, taxpayer-oriented processes like enforcing "responsibility to society" and enforcing the program's disciplinary rules, might actually undermine the more client-oriented motivational structures in the program. Conversely, an emphasis on taxpayer-oriented processes without a concomitant emphasis on client motivation and capability could perhaps provoke resistance on the part of individual clients and potentially, if it becomes sufficiently widespread, can feed back into more punitive actions by line workers, corresponding increases in paperwork, and inescapable decreases in the amount of time available for service-related casework.

-- Motivating front-line staff to put out effort. The same philosophically coherent ideas about the value of work that are relied on to motivate clients can also motivate staff. Recruiting staff with the right motivation can in some cases be undertaken.

-- Building staff capacity. Recruitment is one approach to this. Training is another.

Specific variants: The generic design can accommodate routing clients through education or training programs before their entry into job search, although special efforts may be required to induce school and vocational training personnel to help maintain the climate of high-expectations. The generic design can also accommodate emphasizing the recruitment of participants through volunteering or through mandatory enforcement of JOBS rules (see p. X for a full discussion).

Costs: The ratio of clients to front-line case managers should not exceed some level that permits relatively frequent telephone contact between worker and client (perhaps 1:110-125?). If

budget constraints preclude hiring job developers, resources may be withdrawn from the case management function in order to fund these. However, at high client-to-staff ratios, the relative productivity of job developers and case managers is not known. The cost of motivational training materials is modest compared to higher staff costs, but their efficacy is uncertain. Staff training costs are modest.

Vulnerabilities: Political pressures from the welfare rights direction can interfere with using JOBS participation requirements as a vehicle for the development of work-compatible habits and attitudes. Political pressures from various sources can force clients into sterile and demoralizing "work experience" jobs. Habits of cynicism about client abilities and motivation may suppress efforts by front-line staff, particularly long-time employees. Peer group reinforcements can be counterproductive if a large minority have negative views of the program or of working; however, it is not known how large a minority exceeds the critical mass.

Variants for optimization: Very high performance may be achievable if quarterly job placement standards are imposed on case managers who are responsible for job placement (as opposed to supervising training or education functions, say). An "inverted pyramid" approach to managing line-level personnel may be used to provide optimal sense of empowerment at that level and to feed information relevant to ongoing program redesign back into the management system. This latter approach, however, risks creating a competitor to top managers in defining the basic mission and objectives of the program.

Performance-based contracting is easily adapted to structuring relations between the welfare agency and providers of Basic Education services to its JOBS clients.

Personal risks and effort: Most functions are well within the tolerance range for most DSS agency managers. However, introducing quarterly placement standards can be controversial and may require unusual attention.

Field reports: The JOBS program in Riverside County, California, uses the high-expectations design and incorporates quarterly placement standards as well. An experimental-design evaluation of their program showed unusual success relative to other welfare-to-work programs for which there is an evaluation record. However, it is not certain the high-expectations design was responsible for the County's high success; a very brisk level of new-job creation in the economic region might also have played a role.

[END OF TABLE 1]

Are manuals containing entries like this feasible and desirable? I acknowledge that I have prepared this illustrative entry in a spirit of provocation. Manuals are not the communications medium of choice these days. However, the conception of the knowledge "product" seems to me correct, even though many questions can be raised about how we store, package, disseminate, and use the product.

IV. The Logical Basis of Generic Models

Unfortunately, the generic models approach raises several conceptual and philosophical issues. The ones to be discussed here in this connection concern: the interpretation of causality; tests of model validity; the ontological status of generic phenomena, including the concept of developmental "potential;" and the legitimacy of multiple models.

Interpreting causality. A system causes an output. And because the system design causes the system to work in a certain way, the design does causal work. Conversely, it has real effects which are in some sense "explained" by pointing to the design.

Nevertheless, in attempting to understand generic design, it is best to keep some distance from the conventional explanatory vocabulary of the social sciences that identifies explanation with lawlike statements about the causes of observed variations. Lawrence Mohr's distinction between "process theory" and "variance theory" is very much to the point here.¹⁶ Understanding the design of a generic production system -- which we have above identified with understanding how sequences and combinations of operations can transform certain materials -- is largely a matter of process theorizing. And this means that the whole vocabulary and conceptual apparatus of variance theory -- variables, correlations, necessary and/or sufficient conditions, the black box of "interactions" -- is at risk of being irrelevant at best and misleading at worst.

As an example, consider the case of "necessary conditions." When different features are near-substitutes in performing some systemic function, then none of them is, in a literal sense, necessary. When certain system processes feed back into one another in a dynamic relationship, and each one becomes a causal "condition" for the other, then which is a cause and which an effect? To understand the feedback relationships between the volatile suspended solids in the aeration basin and those in the settler, and how the design influences this relationship, for instance, is rather different from saying what explains why each has any particular level of volatile suspended solids at any given moment.

In the context of process analysis, "explicating" -- the root meaning of which is "unfolding" -- sequenced interrelationships is much more to the point than "explaining," which term tends at this point in the life of the social sciences to connote, unfortunately, only the sort of understanding that is associated with variance theory.¹⁷

None of this means that generic models of production systems do not include any statements at all with the flavor of variance theory, however. Well-developed models of production relationships obviously must include information about the strength of causal relationships of the sort that regression analysis can potentially deliver, e.g., "In a high-expectations welfare-to-work program, peer support groups are, on average, more cost-effective than the N other tested means of performing the psychological support function." However, the

¹⁶ Mohr, 1982, ch. 2.

¹⁷ Mohr's 1982 critique of variance theory is more persuasive than his prescription for how to carry out causal analysis in process theory, however. In a recent paper (Mohr, 1993), he has pushed causal interpretation in process analysis in very useful directions, however.

use of regression for this purpose involves looking for what Achen (1982, pp. 68 ff.) calls the “theoretical,” as opposed to the “level” or the “dispersion,” importance of a variable.

A pragmatic approach to model validation. How distinguish between a better and a worse “explication” of some system design? In the engineering context, a generic model is not valid unless it can help predict system behavior in appropriately specified settings. But this approach to validation makes sense only if all the relevant parameters can be measured to the needed degree of precision. Since this is not the case for most managerial systems of interest, validation by means of predicting overall system performance is not likely to be a promising approach.

If prediction is the gold standard, however, it is not the only standard. Utility is also a relevant standard -- utility in framing problems, generating candidate solutions, and highlighting certain true and quantitatively describable relationships among “variables” as conventionally understood. Measured against a standard of utility, models are not likely to be wholly embraced or rejected. The worth of any model must be assessed relative not only to the task at hand but relative to other competing models asked to perform in the same utilitarian domain.¹⁸

Ontological puzzles. What domain is this exactly? It is easy enough to understand how a “good” generic model might be used to tinker with some particular system functioning in some known context. But what does “goodness” mean if the system or the context particularities are not known or -- more to the point -- are expected to vary considerably? What distinguishes a better from a worse generic model of “how a clock works,” for instance, if we do not intend to use some actual and particular clock to serve as a literal model for a “generic” clock? To put the problem another way, if generic models describe generic entities, where in the real world are such entities?

It does not help to say that the properties of a generic clock are “what all actual clocks have in common,” because it is possible that they have some things in common (roundness, perhaps) that are irrelevant to how they work. This is not an imaginary problem: many observers think of economic regulation and social regulation as specific variants of an underlying generic “regulation, for instance;” but the designs thus categorized are sufficiently unlike in terms of basic function and process so that consolidation obscures more than it reveals.

In one respect this is a problem in ontology. If we could speak meaningfully of an “essence” of “clockness” -- or of an activated sludge WTP system or a high-expectations welfare-to-work system -- we could believe that some models explicate their respective designs better than others. But if we cannot talk meaningfully of such essences, it is hard to know what exactly it is that a “good” generic model is explicating.

¹⁸ Generic models, therefore, will not satisfy Popperian requirements for falsifiability. But performing decisive experiments and hurling newly falsified theories from the craggy heights is not what physicists, biologists, or other natural scientists do anyway in order to advance the work of their professional communities.

Some colleagues have argued that I should be using the term “theory” to describe the general framework of causal interpretation that I intend by “model.” However, the many connotations of “theory” bring their own problems.

This ontological problem deserves better analysis than I have been able to supply. However, I would say that, while a reversion to Aristotelian essentialist ideas would be unwarranted, some sort of ontological realism is inescapable. Either there “really is” an activated sludge technology or, more plausibly, we need to conduct ourselves as though this were so. And if the latter, then we need to develop a linguistic consensus on what the essence of this technology will be taken to be. So as not to load more into the definition of any “essence” than is necessary - - we do, after all, wish to leave as much as possible for empirical discovery -- we should aim to define “system design X” by reference to the smallest and most generic bundle of operations, materials, and functional relationships that can transform the relevant inputs into some specified output. For example:

-- A generic high-expectations welfare-to-work system could be defined as one that transforms less motivated into more motivated program clients by combining the first four motivational functions listed above in Table 1.

-- A generic government inspection program could be defined as one that (1) sets standards of “responsible” conduct, (2) motivates individuals or firms to meet those standards by threats of sanctions for noncompliance, and (3) and attempts to bring noncomplying conduct to light.

-- A generic common property resource management system could be defined as one that creates and enforces a body of allocation rules that restricts individuals’ otherwise unlimited and destructive use of the resource to amounts consistent with long-run resource renewability.

Up to a point, therefore, we are converting an ontological problem into a semantic problem. Fortunately, contemporary cognitive science offers some modest help on how to manage the semantic problem. One prescription is not to look to commonalty of attributes as a condition for categorizing phenomena under one name. As suggested above, this approach is not only misleading analytically but is also alien to everyday linguistic practice (Lakoff, 1987). Secondly, in discussions about what should and should not count as excellent or not-so-excellent embodiments of generic designs, e.g., Riverside as a high-expectations welfare-to-work program, it probably helps to be able to point to “prototypical” specimens that can function as points of reference. This idea is commonsensical, more or less accords with current practice when it comes to the discussion of “contested concepts” (Collier and Mahon, 1992), and can claim an intellectual pedigree in contemporary linguistic theory (Lakoff, 1987).¹⁹ Failing to discover an actual prototype, it may be possible to construct a hypothetical prototype, although doing so might open the door to ideological conflict.

Many purposes, many models. I said above that “system design X” is not the same as thing as a model of that design. The high-expectations program of Table I, for instance, is a particular model of an underlying design. For practical, philosophical, scientific, and other reasons held by the person rendering the model (myself) that model highlights certain features of

¹⁹ Exactly how one uses the prototype as a point of reference admits of many possibilities. Collier and Mahon (1992) favor using a “radial” model to move outward from the prototype, but Lakoff makes it clear that many other models are also available.

the design and downplays others. Another observer, with different purposes, might render the model slightly differently.

Variations of this sort are legitimate. For the foreseeable future, most models of generic designs in the management field will be verbal and qualitative, and will reflect the particular interests and perspectives of the model constructor as well as those imputed to the model constructor's audience.²⁰ Furthermore, for technical reasons, variations in model description are also inevitable. We have seen that a design is a way of assembling and organizing a number of functions and features so that the resulting system works to produce a range of possible outcomes depending on local circumstances. To "understand" it is, we have said, to understand how it shapes the system to meet certain challenges. Now, if a design is all this -- does all this -- is it really conceivable that it can be described in one uniquely correct fashion? Even in engineering, the inevitability and legitimacy of different models is accepted -- at least by Denn, who writes of engineering models:

...there is no ONE MODEL for a given process (except the process itself). Rather, there will be many models -- indeed, perhaps a continuum of models -- each appropriate to given objectives. (15, emphasis in original)

The reality of "structured potential". The claim made at the beginning of the paper that the generic models approach can forge a link between practical and scientific knowledge depends crucially on the following three propositions:

(1) Purposive action can usefully be characterized as the creation of desired "variants" out of materials with generic potentialities.

(2) "Generic potentialities" exist.

(3) Social scientists can study such potentialities systematically.

As I have already discussed the first proposition and will discuss the third in the following section, I shall comment here only on the second.

One can imagine a hard-boiled empirical social scientist saying something like this: "I am not interested in things that might happen. Lots of things might happen. I care only about what does happen. I am interested in the actual, not the merely possible." This position is mistaken for several reasons.

First, the concept of "potential" refers to real phenomena that do important causal work in physical nature and cannot reasonably be ignored. "Potential energy" is familiar from high school physics, of course; and evolutionary biology makes much of the fact that "the actual" is only a chance realization of many possible realizations that some gene pool (as well as phenomena at the

²⁰ It is possible that models of some designs would be aptly expressed as computer programs that support simulations. Or they might show up, like game theoretic models, which do indeed represent system designs in my sense of the term, as a set of simultaneous equations.

phenotypic level) holds forth as potential (Sober, 1984; Jacob, 1982). It is at least reasonable to believe that social nature contains analogous sorts of potential.

Secondly, hard-boiled social scientists in fact talk about potential all the time. Among the more hard-boiled are economists, who talk of "potential Pareto improvements." While this can be a purely logical usage, it can also refer to real phenomena, e.g., the real potential -- complete with estimatable magnitudes -- of a functioning but imperfect real market to change its current pattern of resource allocation to a different, and partially predictable, one. And some particular queuing system may have the potential to function much more efficiently if the timing of arrivals can be smoothed out. Whether these potentials exist, and how large they may be, are questions that can be contemplated even if one believes that the potentials will never be realized.

Consider a lump of sugar. It has a potential called "solubility." Whether it actually dissolves in its lifetime might depend on whether or not someone wishes to dissolve it and on whether or not suitable liquids are available for causing it to dissolve. A satisfying account of its solubility obviously does not entail describing the full range of conditions that could actually bring about its dissolution, although a sketch of a representative scenario would very likely add to our satisfaction with any particular account.²¹

V. The Empirical Basis of Generic Models

Many a "case study" in public management, or in the social sciences more broadly, can be seen as an unself-conscious effort to discover or validate something like a generic design. In the remainder of this paper we explore the broad outlines of a more self-conscious effort to use case studies for this and related purposes.

"Cases" and "Specimens"

What is "a case"? Almost anything can count as a case in some context or another. But in the context of efforts to model generic designs, a case must be something particular, to wit: a set of interrelated actions and events serving as a medium through which we can understand the underlying design. In the context of efforts to understand the design of a generic production system, we will often be looking at the system through the medium of some particular organization, or some loose system of organizations, that is carrying out the design.²²

²¹ It is true that the study of potential does pose puzzling philosophical questions well known to the subfield of philosophy concerned with "modality," that is such phenomena as "dispositions" (e.g., "conductivity") and such intellectual constructs as counter-factuals. However, the least controversial of such questions concerns dispositions, which are taken to be real and knowable (Mondadori and Morton, 1979; see Secord, 1986, for applications of these philosophical ideas to psychology). And that is what I believe we are talking about when we talk about the potential of a generic design to do causal work in the world.

²² To some degree the structure and operations of the organization might also be part of the design, that is to say, "caused" by the design. A particular wastewater treatment plant, to harken back to our engineering example, is a medium through which we can observe and analyze the generic technology and is also, to some extent, an assemblage of elements dictated by the technology. On the embodiment of designs in physical objects, and their logical independence from "the same" designs as experienced by the user or planned by the object's designer, see Norman, 1990.

Note that this is not the same as saying that a case is an “example” of something, though some cases can be that as well. Nor is it necessarily an “experiment” in the sense that Yin (1984) intends in his book on case study methodology. It might better be thought of as a “specimen,” in the sense that Fido is a specimen of a generic dog, or the San Francisco wastewater treatment plant is a specimen of a generic WTP, or the Riverside County JOBS program is a specimen of a generic high-expectations JOBS program.

A “Good” Specimen

In the quest to explicate generic designs and their variants, two sorts of specimens are relevant. One sort can be used to improve what I called “technical understanding,” that is, to illuminate how the design works at all. The second sort is used to illuminate the array of variants that permit the design to work better or worse under particular conditions. Both sorts of specimens, however, raise similar interpretive problems owing to the presence of idiosyncratic elements that might interfere with correct observation and analysis.

I would conjecture that a good specimen, one that minimizes interference, has these characteristics:

- It embodies the entirety of the generic design. For instance, a “regulatory” program in which sanctions are never threatened or used would not be a good specimen.
- The specimen performs in some known fashion. For instance, it performs on dimension X “adequately” or “poorly” or “extremely well,” or its performance is “distorted in direction Y.”
- The generic design plays a causal role in performing the known effect.

When I was searching for a specimen of a high-expectations JOBS program, Riverside County appeared a good choice on the first two of these grounds. First, the program managers’ rhetoric was unusually filled with phrases about “expectations” and motivated clients’ efforts at self-help. Secondly, as a JOBS program, it performed well: preliminary findings from an MDRC experimental-design study of its effectiveness were very positive (Riccio and Friedlander, 1992). On the third point I had no strong prior beliefs about the program, although program managers I interviewed believed that there was a causal connection between the climate of expectations and the program’s performance.

In general, specimen-based research will encounter two sorts of difficulties with finding “good” specimens. One will be that we mistakenly believe poor specimens to be “good” specimens and thereby risk making interpretive errors. The other will be that the specimens available for study will be known to be imperfect in one or more respects. I shall return to these problems below. For the purposes of discussion until that point, however, I shall assume that we are working with “good” specimens.²³

²³ I do not, in this paper, discuss the techniques for gathering data about the specimen. On this topic, see Yin, 1984, and Agranoff and Radin, 1991.

Collecting Specimens In Families

No specimen can be analyzed except against some background. My interpretation of how the Riverside high-expectations model worked, for instance, was formed in part against the background of knowledge, drawn from the existing research literature, about how a “normal” or “routine” welfare-to-work program operates, that is, a program in which the high-expectations design is simply absent (Mead, 1985). Quite a different sort of background, however, is provided by other specimens of the same generic design that vary among themselves. We can think of specimens that create a background of intra-generic variation for one another as a “family” of specimens.

As with any family, we may study its members with a view to discerning either their similarities or their differences. In the end we are likely to feel that a “full understanding” of the family and its members involves an appreciation of both similarity and difference, and an understanding of the underlying genetic and environmental influences that give rise to both. I shall here discuss three, out of many more possible, research objectives for which assembling a family of specimens might be undertaken.

Defining prototypical characteristics. Although the classifications made by conventional linguistic categories may be misleading, they are one place to start when trying to define the prototypical characteristics of a generic design. Assembling a family of seemingly diverse specimens called by the same name can present a useful platform for attempting to construct a definitional prototype of a generic design. Although we were at the time unable to articulate the full theoretical rationale, in our study of social regulation Kagan and I (Bardach and Kagan, 1982) selected specimens of regulatory systems that dealt with a wide range of tasks, e.g., milk and dairy, restaurant sanitation, building codes, affirmative action hiring, occupational health and safety, nursing homes. In retrospect, it appears that we were attempting to find an empirical basis for defining prototypical design characteristics.

Viewing a design refracted through different purposes. A production system creates outputs with many dimensions of value (negative as well as positive). A generic design can usually be adapted to emphasize some of these dimensions, perhaps at the expense of others. For any number of reasons, the researcher may wish to assemble a family of specimens that includes a variety of such adaptations.

In my study of a high-expectations welfare-to-work program I was interested to learn how the basic design, which seemed to emphasize relatively quick job placement, could be adapted to include an education or training component that preceded job search and job placement. Although I was not able to study very many such specimens, I concluded (1) that special attention must be paid to the problem of getting the relevant education and training institutions to cooperate in maintaining the high-expectations environment, and (2) that although education and training might be intended to function as a complement to other efforts at job readiness and placement, these could also become substitutes for such efforts.²⁴

²⁴ Allowing or encouraging such a substitution might make sense in a depressed labor market. Of course, the resulting program should probably not then be said to be following a “high-expectations” design.

Identifying generic vulnerabilities and compensatory strategies. One of the JOBS specimens I studied was Tulare County, California. All the elements of a Riverside-type high-expectations program were present except for the assurance of private-sector job opportunities (the local labor market having been very depressed). The Tulare program was also not very effective in placing clients in jobs (Riccio and Friedlander, 1992, Table 3.1). One plausible inference is that a high-expectations program needs somehow to compensate for a poor job market if it is to work. The Tulare program attempted to do this by placing clients in unpaid "work experience" positions in nonprofit and public sector organizations.

Once I had identified the availability of jobs as a factor to which a generic high-expectations program might be especially sensitive, it was possible to explore the variety of ways in which programs tried to compensate for their vulnerabilities. Some, like San Francisco, essentially did not try to run a high-expectations program at all. Others, like Alameda County, tried to push education and training as a way to increase the competitiveness of their clients. Others spoke of the desirability of hiring job developers who might give their clients an edge in gaining access to employers -- even though these programs did not necessarily actually make this investment.

It should be noted that the mapping of generic vulnerabilities²⁵ does not necessarily depend on finding very many (or possibly any) specimens of actual failure. Observing the variety and extensiveness of investments in prevention and other compensatory strategies is a plausible alternative approach.²⁶

The Question of Family Size

None of these above three objectives requires studying a very large number of specimens. More important than numbers is the selection of specimens believed to embody interesting variants of the generic design. For designs that are not unusually complex, three to twenty might do.²⁷ By the standards of most statistical studies these are small numbers indeed. At work here, however, is the principle that data and theory are to some extent substitutable. Design analysis, and hence specimen selection, are extremely theory-intensive. It is indicative that Ostrom's *Governing the Commons*, which I would say studies the design of generic common-pool-resource management systems, describes in any depth no more than about twenty specimens. Her footnotes and references make it clear that she surveyed many more than this. But evidently she felt that readers ought to be persuaded by her careful analytical rendering of a correctly chosen twenty or so.

²⁵ Vulnerabilities to distortion and abuse are probably as important as vulnerabilities to ineffective performance. I refer here only to the latter type of vulnerability only in order to save space.

²⁶ Kagan and I followed this approach in our study of the enforcement of social regulation (Bardach and Kagan, 1982).

²⁷ Yin (1984, p. 53) makes what I take to be the same point in the context of his discussion of what he calls "replication logic" as opposed to "sampling logic" in the selection of cases for comparative study. Yin's discussion also implies that he too is thinking about numbers in the same range as the one I have mentioned.

Working With Specimens That Are Not “Good”

Working with defective specimens leads to problems. Some are genuinely serious, while others are less serious than might be suspected.

What if the design does not cause the outcome? Consider the Riverside JOBS program. Although the MDRC evaluation does show that the program as a whole is effective, it does not speak to the question of whether the high-expectations aspect of the program design contributed to its effectiveness. I have assumed that it did so. But suppose, in the extreme case, that it did not do so at all. Suppose, for instance, that the effectiveness of the program is attributable entirely to the unusual supervisory method used in the program, namely, setting quarterly job placement standards for line case workers and holding them closely to account for meeting them.

In assessing the significance of the mistaken causal assumption it is important to diagnose why it might have occurred. The most likely possibility is that the high-expectations design works exactly as has been hypothesized within some limited motivational system but that this system is itself contained within a larger system that somehow neutralizes its effect. In this case, our understanding of the generic design would be in some sense “correct” but only “partial.” Actions taken on the basis of this partial understanding, however, would probably be futile.

Less extreme than the case in which the design has no causal effect at all is the case in which the design has a weak effect. In this case, understanding of the generic design might be both correct and complete in a qualitative sense but incomplete in a quantitative sense. Actions taken on the basis of this incomplete understanding might be better than futile but still not such as would have been chosen had understanding been more comprehensive.

One corrective for both sorts of mistakes is a very conventional one: statistical studies trying to adjust, in one way or another, for the influences of suppressor variables, and studies trying to assess the strength of relationships. Of course, these sorts of studies are costly and are not likely to be done except in a tiny percentage of cases. For the remainder, the best corrective will simply be self-conscious efforts to avoid the mistakes.

What if the specimen performs differently than is supposed? One scenario of interest is that the performance is worse than believed and that the design of the system in part causes the relatively poor performance. This could, of course, lead to serious errors of decision as well as to very flawed understanding. The desire to avoid these mistakes may lead researchers to focus on specimens in which performance appears to be in a safely high range. I did this in selecting Riverside as a specimen. It would appear that Michael Barzelay did this in selecting Minnesota as a specimen for his study of the administrative philosophy he calls “the post-bureaucratic paradigm.”

The danger in this strategy is that the nature of the generic design will be partially obscured by idiosyncratic (non-design-related) elements peculiar to the specimen. In Riverside, as I said above, special supervisory methods may have played -- indeed, probably did play -- an important role in producing performance effects. In Minnesota, the obvious concern is that the Northern European (or specifically Scandinavian) good government ethos makes any

administrative philosophy that relies to an unusual extent on the underlying reasonableness and decency of the individuals who carry it out altogether too easy.

It must be emphasized, however, that not all elements peculiar to the specimen are unrelated to the functioning of the generic design. In the Minnesota case, if it is true that there is indeed a local good government ethos, it may simply be improving the conduct of officials who are liberated by the post-bureaucratic paradigm to do things they had long wanted to do and were capable of doing. The same logic applies to the Riverside JOBS case: one could believe that the philosophical coherence of the high-expectations design helped in some way to legitimate the role of placement standards in the overall system and also to motivate efforts not only to meet the standards but to exceed them. In these examples, the design elements particular to the locale also "belong" to the generic design, in that (1) they would not be possible without the potentiating presence of the generic design, and (2) they enhance the effectiveness latent in the generic design. There is synergy, in short.

What if a specimen contains only part of the design? A problem of particular interest concerns the knowing use of incomplete specimens. In my JOBS study, for instance, I visited a number of program sites where I found good specimens of individual case workers or managers or office units that were implementing some component of a high-expectations system -- the philosophy of using the program as a vehicle for socialization, say, or the rhetoric of work as a route to personal liberation. I found two uses for such specimens. One was to add to my understanding of the feature-function relationships internal to that component, e.g., the varieties of rhetoric used to accomplish the client support function or the supervisory methods used to elicit effort from the line workers.

The second was to try to improve my estimation of the synergistic effects of combining all the elements of the postulated generic design into a coherent system. That is, the performance of the isolated component was usually taken to be a measure of frustration and limitation relative to what it would have been in a more supportive setting. Of course, because comparisons of this sort quickly run into problems of background noise due to uncontrolled variation, it was difficult to have much confidence in them.

It remains to be seen whether it is possible to develop a research strategy which can predict synergistic effects among system components based simply on the study of each component functioning on its own. Clearly, there is a reason for desiring to do so when a proposed new program or policy idea intends to integrate elements never before brought together but each of them having produced some sort of track record separately.

VI. Summary, Conclusion, and a Look Ahead

At the outset I claimed that the generic models approach would help public management research to structure an overarching research agenda, carry out case study research in a more methodologically responsible manner, and forge links between theoretical and practical knowledge. For each of these objectives, the succinct prescriptions are, respectively:

-- Build a portfolio of generic models and their variants.

-- Find and analyze families of good specimens of generic designs.

-- Make checklists out of sets of alternative features capable of performing specified functions in generic designs, and quantitatively estimate the performance potential of these features.

The analysis in this paper has been limited to generic models of phenomena that can plausibly be construed as "production systems." Just how many phenomena of interest to public management could reasonably be construed in this way is an open question, although I also suggested that "strategies" would probably fit. By way of conclusion, I would also raise the question of whether the generic models approach could extend beyond "production" to other process-dominated systems like "group problem-solving" (Bardach, 1993b) or "negotiations."²⁸

I also briefly explored a number of conceptual and philosophical issues associated with the generic models approach. Most of these issues warrant deeper and more extensive exploration in the social sciences generally, for they have a bearing on the choice of basic mission and methodological framework that extend far beyond whether the generic models approach is of any value.

The arguments in this paper are, of course, largely exploratory and in some cases amount to little more than conjecture. They should be seen, above all, as an invitation to further thought and discussion.

²⁸ In fact, the negotiations literature already makes use of generic models and occasionally even refers to them as such, albeit not self-consciously. See Raiffa, 1982, and O'Hare et al., 1984.

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