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# Social Learning: A Model for Policy Research

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## Preface

This paper concerns the question of how policy research can be made more useful in practice. Two types of policy research may be distinguished. The first is research on issues in the public realm and not addressed to a specific client. The "consumers" of this type of research -- those whom it stimulates to thought -- are other interested scholars and practitioners, and the arguments proceed from many different quarters and perspectives. Answers given in this context are neither right nor wrong: they merely illuminate an issue of public concern and enhance our understanding of it. In this special sense, policy research resembles, in Cohen and Garet's language, "a discourse about social reality -- a debate about social problems and their solutions" [1].

The second type of policy research does have a client and is therefore pitched to an existing social problem that is located within a specific policy environment. Although we recognize that the distinction we are attempting to draw is imprecise, we propose to deal in this paper with only the second type of policy research and further limit ourselves to social policy.

Such research is bought and sold, but its results are rarely used in the solution of a problem [2]. Our intention, then, is to find out why and in what circumstances this outcome is highly probable and what, if anything, might be done about it.

# Social Learning: A Model for Policy Research

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## The Approach

Our paper can be regarded as a normative/descriptive undertaking. It is descriptive in that several existing models of policy research are examined. In all of them, knowledge is exchanged as a commodity, but the knowledge fails to be applied successfully in practice. A major reason for this is shown to reside in the organizational and task environments of both the policy maker (buyer) and researcher (seller), each of whom is subject to a different structure of rewards. It is normative in that, in light of the repeated failures of traditional policy research, an alternative "standard" is proposed, based on the idea of social learning [3].

We have not attempted a dynamic analysis that describes conditions for transition from one state (existing models of policy research) to another state (the social learning model), with explicit attention to the benefits, costs, and characteristics of alternative paths of transformation. Our paper is more in line with comparative static analysis, where a critical description of several existing (if idealized) policy research models is presented. The social learning model is then developed as more appropriate to the complex dynamic and evolving context of contemporary policy. Many of the most important practical problems reside there. They include problems of institutional change in the face of pressures for stability, the political and non-rational dimensions of implementing institutional change, and the analysis of benefits and costs implicit in institutional transformation, as well as problems of measurement. Clearly, intensification is needed of both conceptual and operational research on the general problems of knowledge transfer, on the relationship between institutional change and maintenance, and on problems of implementation. Nevertheless, we are persuaded that better rationalizations concerning the relation of policy making to research have to be developed first.

The Setting

The general class of problems with which we are concerned can be characterized as "strategic planning problems". They include those current decisions that will significantly affect future policy alternatives and/or the environment within which policy will be formulated and implemented. They tend to be unstructured problems [4]:

> There is no cut-and-dry method for handling the problem because it hasn't arisen before, or because its precise nature and structure are elusive and complex, or because it is so important that it deserves a custom-tailored treatment [5].

By unstructured policy problems we mean those for which

> ... the system has no specific procedures ... but must fall back on whatever general capacity it has for intelligent, adaptive, problem-oriented action [6].

A given issue may be recognized as an unstructured strategic planning problem at the outset of the policy process. Alternatively, what was initially considered a relatively well-defined, operational problem may emerge as ill-structured and strategic in nature. This class of problems is both significant and pervasive in public decision-making. It is precisely in this context that policy research becomes most important as a form of "learning".

We can clarify these distinctions with the help of the following matrix [7][8]. On the vertical axis we can identify two polar cases. In cells I and III, goals are explicitly known and can be formulated as "standards" against which alternative courses of action are evaluated. In cells II and IV, goals are ambiguous, multiple, and conflicting. It is difficult to evaluate the contributions and impacts of activities on a scale which is either not defined or is developing.

| | Goals are known | Goals are ambiguous or in conflict |
|---|---|---|
| Means-ends relationships are known at least probabilistically | I | II |
| Means-ends relationships are highly uncertain | III | IV |

On the horizontal axis, in cells I and II, means-ends relationships can be known, and critical variables can be identified. By contrast, in cells III and IV, means-ends relationships are ambiguous even when, as in cell III, goals are clearly defined. The specification of critical variables is elusive and the contribution of activities to performance is uncertain.

Our focus is primarily on policy problems that emerge in cell IV. There is no explicit agreement on goals, nor is there a clear understanding of means-ends relationships. These are the problems that typically require policy research, since their resolution is a complex, evolving process. It is from this perspective that we examine the question of how policy research can be made more useful in practice.

Summary of Social Learning Model

Social learning occurs in a setting of social practice. The latter may be conceptualized as composed of four dynamically interrelated processes: the formulation of a theory of reality, the articulation of relevant social values, the selection of an appropriate political strategy, and the implementation of practical measures or social action. Traditional policy research has focussed primarily on the first of these--the theory of reality--which may be broadly defined as the actor's image of the situation that confronts him.

This image can be shown to have both a relatively stable core and a variable periphery of related meanings. Effective action on a major social problem may require a change in this image. And this, in turn, may require a restructuring of core meanings as well as modification in the actor's other processes of social practice--his social values, political strategy, and implementation practice. These dimensions, however, are not easily touched by traditional research.

Research may assist in the restructuring of the policy maker's image of reality by designing and becoming part of one or more experimental settings for social practice. Contrary to recent thinking about social experimentation, these settings are not regarded as controlled experiments that critically assess the

efficacy of a specific innovation in policy but as an open-ended exploration of a total environment that promises to lead to the discovery of ways that will recast a given problem situation into a more desirable form.

The major elements of this new model, which is ultimately based on the idea of social learning, are described, and criteria for devising experimental settings are suggested. The paper concludes with speculative comments on how the learning acquired in experimental settings may be rendered more generally useful in the solution of a social problem.

## Assumptions of Traditional Policy Research

In the remainder of this paper, we assume that the potential user of policy research--the client--is identical with the contracting party for research; we shall call him the policy maker. In practice, the two may be quite different entities, as when the Department of Health, Education, and Welfare finances research involving a university-based research team and a local school board to test a system of educational vouchers. By our simplifying assumption, both the immediate client and the more distant financing agency will be treated as one and the same. This will facilitate the exposition of what we have to say; it will not significantly distort our conclusions.

In the typical case, then, the policy maker becomes aware of and confronts an issue which resists his attempt to resolve it. Suspecting that the fault may lie with his incomplete understanding of the causes of the problem, he turns to a policy research unit for an independent, scientific assessment of the problem. There may be a number of other reasons why the policy maker may wish to buy new knowledge, but these do not concern us here. Instead, we shall deal with a case of presumed ignorance on his part. The research unit, then, agrees to sell its services in the expectation (or hope) that the knowledge gained from its research will be used in the attempted solution of the problem. This situation, which we regard as typical, rests on four major premises:

1. that the problem is likely to yield to scientific analysis;
2. that the problem is well bounded and technical;

3. that no serious conflict exists between the value premises of policy maker and researcher so that the problem can be studied objectively by removing social valuations as an independent variable from the analysis; and
4. that the policy maker will rationally respond to and act upon new information by taking the actions that are necessary to implement a "scientific" solution.

Models of Policy Research

Current policy analysis conforms to a Market Model of research in which knowledge is bought and sold as a packaged commodity, usually in the form of a written report. Figure 1 shows the basic model, of which all other models to be discussed in this section are simple variants. In this model, both policy maker (PM) and policy researcher (PR) occupy the same organizational environment or transaction space, W-i. This is a world of common understandings concerning the major features of the problem, the basic social valuations that pertain to it, and the rules that govern the exchange of information. It is a demand-activated model in which the policy maker (consumer) signals his "needs for information" (demand) to the researcher (producer) who, based on his subsequent studies, supplies handcrafted conclusions and recommendations for action to his client.

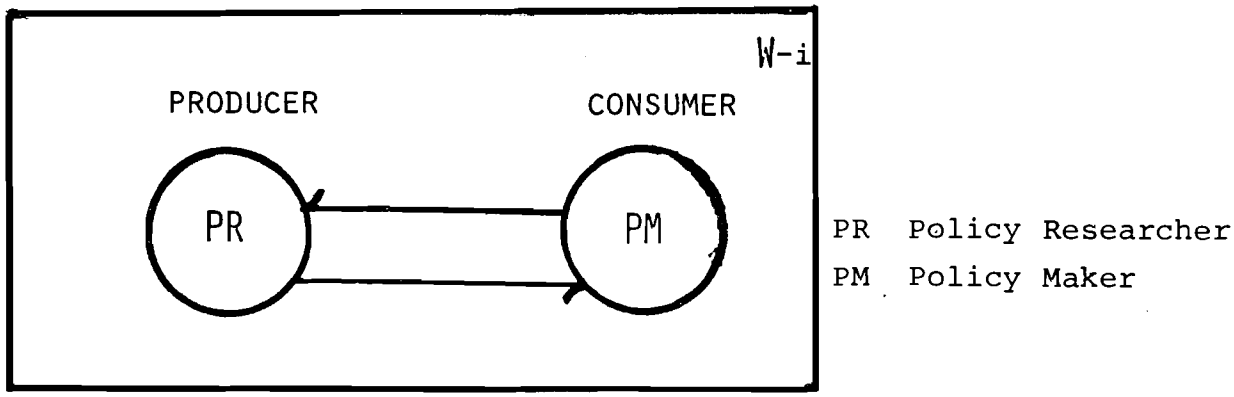



Fig. 1: The Market Model of Policy Research

In its basic form, the Market Model is grossly unrealistic. Policy maker and researcher do not inhabit the same environment. As portrayed in Figure 2, their worlds are altogether different. While the policy researcher is at home in the world of academia (W-I), the policy maker inhabits the world of politics (W-II). The latter is characterized by tight decision deadlines, short time horizons, complex political pressures, critical pay-offs, and the hierarchical constraints of bureaucratic management. The policy maker's criterion for accepting or rejecting new information is an essentially pragmatic one: will it lead to a workable solution?

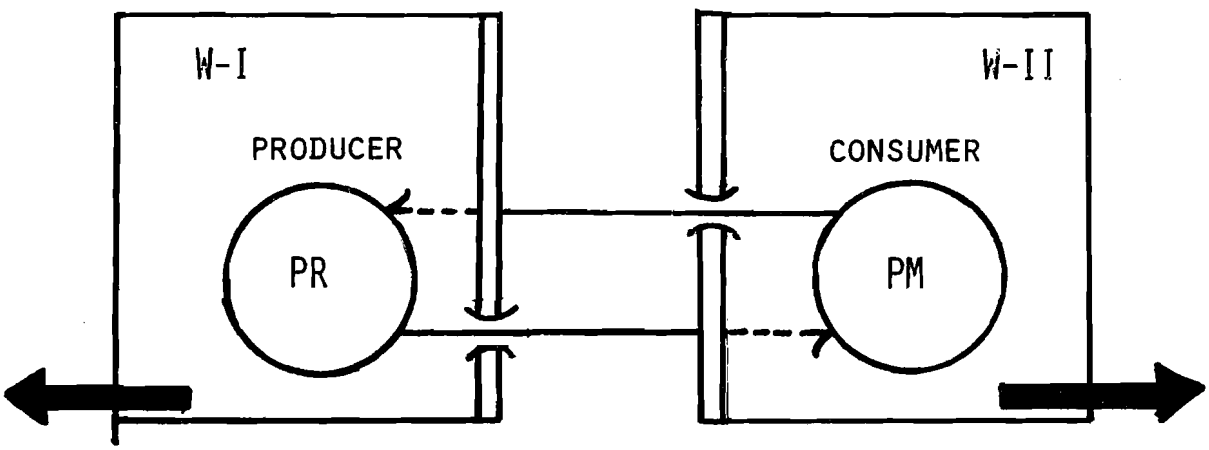



Fig. 2: The Modified Market Model of Policy Research

The world of academia, on the other hand, is the world of disciplinary studies, peer review, and research monographs. Denizen of this world, the research scientist is prepared to incorporate the relevant findings that result from colleagues' work into his own, and whether he chooses to do so depends essentially on such objective criteria as statistical adequacy, logical consistency, propriety of method, and empirical evidence [9]. He has learned to be open to new facts, insights, and ideas, to nurture a critical spirit, and to use knowledge obtained through the methods of science in the construction, elaboration, and testing of theories that are meant to account for and explain selected aspects of the observed world. He will be especially

alert to any knowledge that appears to contradict his own theories which, in this way, are put to the critical test of falsification. In due course, following these procedures, a powerful and scientifically based picture of the world results from this collective effort. According to Schroedinger, this "picture" or "image" is the ultimate reason why we engage in scientific work [10]. Although the image may evolve over time, the major traditions of scientific inquiry remain essentially unchanged [11].

These two worlds, then, are far apart in most of their significant dimensions, and they tend to draw even further apart by the vast differences that exist in the structure of their reward systems. In Figure 2, this is symbolized by the heavy arrows that point outwards from the diagram in opposite directions. It is, therefore, scarcely surprising that substantial barriers to effective communication exist between the worlds of academia and of politics (shown by vertical double lines in Figure 2). The actors in each world are likely to respond to different cues, and neither is likely to hold the other in very high esteem. In their study of the dismal failures of research relevant to planning, Dubbink and Reiff quote an anonymous university man as saying: "If they (i.e., planning practitioners) had anything going for them they wouldn't be where they are." And the government official returns the compliment: "They (i.e., academics) come in here and start pontificating, and we know in a minute that we're not going to get anything out of them." [12].

To meet this problem, the policy maker may be inclined to create his own Internal Research Unit (IRU) within World-II. We have labelled this the Bureaucratic Model of policy research (Figure 3). The Internal Research Unit has a double purpose here: to give continuing policy advice to the decision makers in World-II and to act in a liaison function with the university-based research units in World-I, interpreting the needs of policy to science and the practical meanings and implications of scientific study for use in policy and social practice.

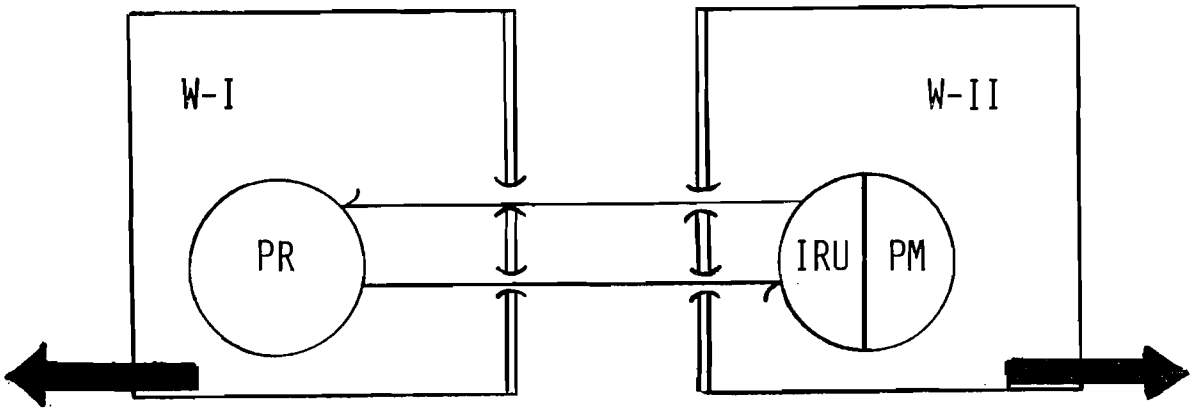
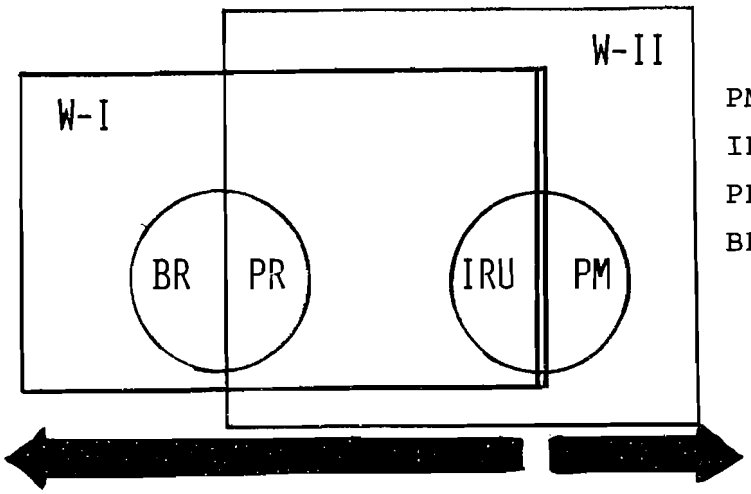



Fig. 3: The Bureaucratic Model of Policy Research

This, at least, is the design; the practice may be very different. In order to survive in World-II, the Internal Research Unit will have to adopt the behavior normally expected of senior government officials and stay closely attuned to the shifting requirements of public policy. Academicians may therefore perceive the internal research staff of World-II as a group of "former" scientists who have "sold out" to the short-range pragmatism that pervades the world of politics. And, indeed, its liaison work may bumble along quite ineffectively. To the extent that it serves its master well, it sacrifices science to the needs of organization, losing touch with the currents and counter-currents of scientific thinking. Thus, the Bureaucratic Model is only a small improvement over the Modified Market Model shown in Figure 2.

Finally, certain avant-garde agencies, aware of the pitfalls of the Bureaucratic Model, may opt for an Academic Model of Policy Research (Figure 4). Here, the Internal Research Unit has been weaned from daily contact with policy making and has come to share many of the preoccupations of the academic world. It will tend to be staffed with bright Ph.D.'s fresh out of graduate school who are looking for some practical experience with government before settling down into an academic career. The Academic Model therefore shifts both our "worlds" towards the basic research pole of scientific work (BR), and away from the more mundane tasks of social policy making (PM). For the status of "pure", disinterested research is still very high in academic circles, and the neat demonstration of a theorem is likely to get one more quickly

promoted to tenure than a consultant report on solid waste disposal to the Municipal Sanitation Department of Rochester, New York.




PM Policy Maker
IRU Internal Research Unit
PR Policy Research Unit
BR Basic Research

Fig. 4: The Academic Model of Policy Research

In sum, it is unlikely that the Market Model of Policy Research and its major variants--Modified, Bureaucratic, and Academic--will yield significant results in practice. Knowledge treated as though it were a commodity cannot be readily understood, translated, and fitted into the ongoing stream of decisions and actions that permeates the life of public agencies. The familiar mechanics of generating and transmitting written reports on policy questions thus appear inappropriate to the practical purposes of "solving" social problems. As Cohen and Garet conclude, "there is little evidence to indicate that government planning offices have succeeded in linking social research and decision-making" [13]. Corroborated many times over, this conclusion either leaves us to indulge a fatalistic despair or encourages us to search for alternative models. The latter is the course we now intend to take.

## Social Practice as a Learning Paradigm

Suppose, for instance, that a policy research unit has been asked to investigate the problem of sub-normal performance on scholastic achievement tests in secondary schools where a majority of the students are members of ethnic minority groups. The research suggests a functional relationship between class size

and test performance and, based on this relationship, recommends a reduction in average class size as the solution to the problem. But this "knowledge" and the recommendation flowing from it are, at this point, nothing more than a theory of the problem that will require verification in practice before it can be accepted as a guide to policy. Until such verification takes place, the theory may appear more or less plausible, but it is not necessarily "correct".

From the policy maker's standpoint, acceptance of a recommendation to reduce the average number of students per class would imply a major change in the organization of secondary education. This can be readily understood by looking at Figure 5 which shows the four major subprocesses that together compose the paradigm of social practice.

The key terms of this paradigm are defined below.

THEORY OF REALITY: a symbolic representation and explanation of the environment confronting an actor. It defines the actor's situation and his role in it.

SOCIAL VALUES: a set of values that provides normative guidance in selecting the actor's strategy. Social values may be expressed holistically as a desirable image of future reality or as a set of discrete decision criteria. In the first, more comprehensive sense, the actor will seek to actualize his values and so transform present reality in accord with his image of what the world should be. In the second, narrower meaning, norms are used to make valuations that lead to the selection of appropriate strategies for action.

POLITICAL STRATEGY: a course of action chosen as the one most likely to produce the desired outcome.

SOCIAL ACTION: practical measures taken to implement the preferred strategy.

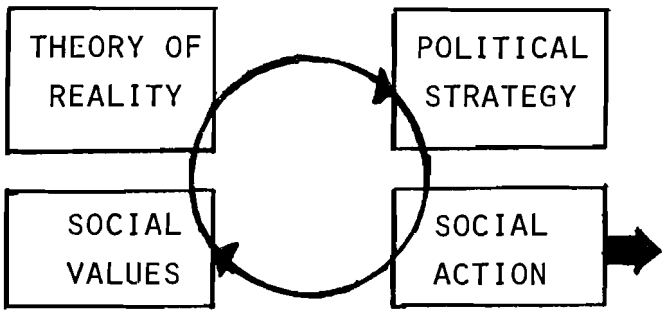



Fig. 5: The Paradigm of Social Practice

These processes come to life only in the context of a concrete action-setting, and they are so connected that a change in any one of them will necessarily affect all others, either producing a substantive change or confirming the existing practice.

Let us now return to our example. The research on scholastic achievement dealt with only one of the subprocesses of our paradigm, the "theory of reality", insofar as it concerned academic performance. The problem was not, however, studied in the four-fold context of social practice, but abstracted from this context through an operation which allowed the remaining subprocesses to be held constant (Figure 6).

In the language of the Market Model and its variants, the problem was conceived as the transfer (or sale) of knowledge from producer to potential consumer either to replace $TR_1$ with $TR_2$ in Figure 6 or, more modestly, to modify the policy maker's present "theory" in light of a scientifically "improved" version of $TR_2$. But a change in the policy maker's "theory" necessarily implies a change in the other subprocesses of his paradigm. Whether or not he will accept the new theory as a basis for his subsequent social practice will, therefore, depend on his ability and his willingness to increase the size of his investment and operating budget or to divert funds from existing commitments to the proposed program requiring construction of additional class rooms and lower student/teacher ratios. And this involves a question of political strategy. It will depend as well on the relative strength of his commitment to improving the scholastic performance of minority students (i.e., his social values). In sum, the policy maker's willingness to "insert" a new theory of reality into his going paradigm requires filling all the boxes on the right-hand side of Figure 6 with new meaning. And this he may not be prepared to do.

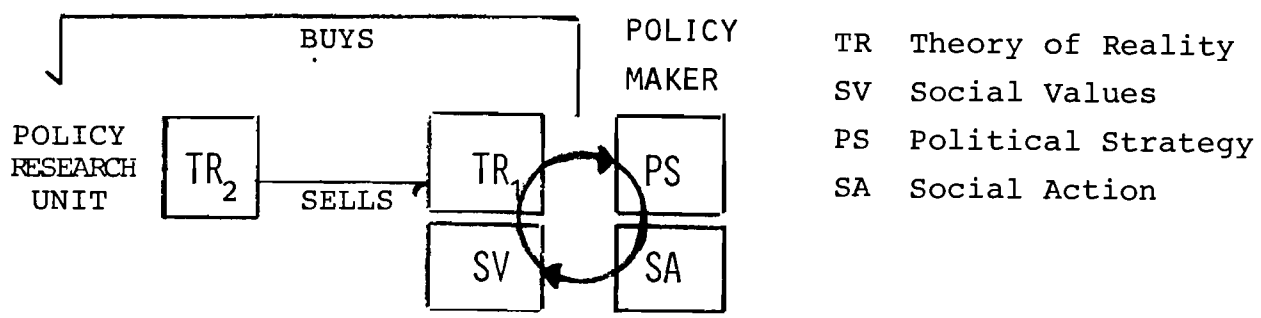



Fig. 6: Policy Research and Social Practice in the Market Model of Policy Research

The paradigm of social practice helps us to understand in what specific sense we must perceive policy research as a process of social learning. Social action produces consequences that, in turn, call forth responses in the actor's theory of reality, his values, and his strategy, either confirming what he already knows or creating incongruities that clamor for resolution. Thus, to test the "correctness" of a new theory of reality ($TR_2$), new action must be undertaken, and this requires activating a whole new paradigm of social practice.

The Role of Images

The problem we posed at the beginning of this paper may now be restated: how should policy research be organized and carried out in order to transform the policy maker's social practice as a whole--reformulate his theory of reality, articulate anew his social purposes, reconsider the question of strategy, and implement new measures.

Market models of policy research focus exclusively on the cognitive component in social practice; they operate on the theory of reality in isolation of the remaining components. A policy maker is, therefore, likely to contract for applied research only when his experience with the results of past actions fails to confirm the paradigm governing these actions and, more specifically, the theory of reality which constitutes an integral part of his paradigm. Where it is positively reinforced, a theory of how the actor's world is made will simply be maintained as a basis for further action?

Following Boulding's terminology, a given theory of reality may also be called the actor's image of his situation [14]. The image is a composite structure of cognitive elements that may be divided into those which constitute a core and a periphery. Whereas peripheral elements may be changed independently of the core, the latter cannot be changed without transforming the periphery as well.

An example may help to clarify this distinction. Returning to our policy maker who is concerned with low scholastic performance of ethnic minority students, we may describe his theory of reality (his image) as follows:

1. Core: Voter resistance to increased taxation is strong; voters prefer ethnically separate school facilities; poor scholastic performance is a significant issue agitating public opinion.
2. Periphery: Scholastic achievement can be objectively measured by means of appropriate testing instruments and varies with biological and cultural factors.

The policy researcher's relevant image, on the other hand, might have this structure:

1. Core: Scholastic achievement can be objectively measured by means of appropriate testing instruments and varies with conditions in the immediate school environment. Improving environmental conditions can therefore lead to improved performance on achievement tests.
2. Periphery: Methods for measuring scholastic achievement may vary and, for certain purposes, some may be preferable to others. None is a perfect measure. Specific factors in school environments may have differential effects on measured scholastic achievement.

In this example, the policy maker's core image is expressed in political terms, while the core of the researcher's image (influenced by his academic setting) seizes upon a "thematic" explanation of the problem in terms of environmental factors [15]. We also observe that the political questions which constitute the core of the policy maker's image are completely absent from the researcher's cognitive horizon.

Throughout this paper, we have assumed that the policy maker will define the problem in terms of a perceived political issue (low scholastic achievement). But while lying at the core of his image, "low scholastic achievement" is explained by a theory of biological and cultural determinism that is located in the periphery of his image. In contracting for research, however, the problem is posed, not in terms of this core image and so as one of political strategy, but in terms of the variables that supposedly "determine" scholastic achievement and for which, it is presumed, a scientific answer can be found. As a result, the researcher focusses on a theory of scholastic achievement (the policy researcher's core image attributes variations in scholastic achievement to environmental conditions), while the researcher's peripheral image concerns more technical matters, such as testing procedures and salient environmental conditions.

When research "solves" the policy maker's problem as originally posed by him, it will, therefore, fail to address the political core of the policy maker's image. To confound matters still further, the researcher's core image will clash with the theory of scholastic achievement that is lodged in the periphery of the policy maker's image. Thus, even if the policy researcher should succeed in persuading his client of the plausibility of his practical "solution" (i.e., smaller class sizes as a salient environmental condition), the client's core image will remain unaffected. In addition, the policy maker will view the recommendation for smaller classes as having a potentially adverse impact. Its implementation would require larger public expenditures, and this is counter-indicated by his understanding of the situation (i.e., voter resistance to increased taxation). As a result, recommendations for action are likely to be ignored.

The question may now be raised: given that the research findings are only working hypotheses derived from statistical analysis of selected information, can these findings be tested in practice and so, perhaps, become sufficiently persuasive to lead to a revision of the policy maker's core image as well? In other words, can an "experimental setting" for social practice be designed that will, at least within a single school, involve the breakdown of large class sizes into smaller instructional units? According to the initial hypothesis, such an action should lead to a measurable improvement in scholastic performance.

## The Social Learning Model of Policy Research

We shall assume that the policy maker agrees to an experiment in social practice. Such an experiment, however, differs radically from the received model of scientific inquiry. For in social practice, the point is not to falsify the hypothesis--a step that would be consistent with the canons of scientific experimentation--but to create a wholly new, unprecedented situation that, in its possiblility for generating new knowledge, goes substantially beyond the initial hypothesis [16]. An experiment in social practice would thus be judged successful if it raised scholastic performance, even where the reasons could not be ascribed to a reduction

in class size. What the literature affectionately knows as the Hawthorne Effect would thus be treated not as a pathology but as an integral part of the experiment [17].

This point is sufficiently important to deserve additional explanation. In contrast to controlled experiments, experimental settings for social practice imply that the motivations introduced will go beyond changing merely one element (average size of class) in order to remain open for experimental variation in all of the component parts of social practice and so create the possibility for a substantial transformation of reality.

Experimental settings for social practice clash with views expressed in Riecken and Boruch's recent book on social experimentation [18]. The authors there propose what might be called a medical model of social experimentation in which the patient is society and the doctors are research scientists. The problem, as they see it, is to find which medication is likely to restore the patient to good health. Riecken and Boruch advocate a method of controlled experimentation which operates, one variable at a time, upon a randomized target population. The proposed procedures are extremely demanding and do not allow for significant participation by the target group in the design of the experiment itself. The hypothesis is then accepted or rejected on the basis of various statistical tests.

Social practice, on the other hand, constitutes a holistic and open experiment in time. Focussed on a non-randomly selected "setting", the experiment is designed as a learning excercise with full participation of the affected population. Each setting would have at least the following characteristics. It would be:

- small enough to facilitate face-to-face encounters of researchers, innovators, and affected population;
- inclusive enough to make the affected population actively participate in the experiment;
- simple enough to permit each participant to acquire a sense of personal efficacy;
- autonomous enough to carry out appropriate actions; and
- bounded enough to bring these actions into focus and to permit a clear evaluation of results.

In the context of our continuing example, such a setting would be a specific locality, a school. It may be helpful to show how such an experiment in social practice might be used to generate significant new knowledge.

STEP I: A policy research group is retained to undertake studies into the question of scholastic underachievement. In due course, research findings are reported and the creation of an experimental setting for social practice is proposed.

STEP II: The proposal is evaluated by the policy maker and agreement is reached on conducting the experiment. A location is tentatively selected and, in the course of several lengthy discussions, the willingness of local school authorities to participate in the experiment is obtained.

STEP III: A small Experiment and Innovation Group (E&I) is set up consisting of members drawn from the policy research team, the policy-making staff, local school officials, teachers, students, and parents. Discussions proceed on the redesign of the school in accord with the original hypothesis (smaller classes) but, in the course of these discussions, new problems will have to be dealt with, calling forth additional hypotheses for action. A new social practice model is therefore being activated: images of reality, social values, political strategies, and actions are all changing.

STEP IV: Innovations are beginning to be introduced. Regular school activities continue and scholastic achievement is tested at regular intervals. Test results are compared with earlier records. The E&I Group conducts further evaluation studies.

STEP V: Based on the complete records of the experiment, a preliminary report of findings is made by the E&I Group to the policy maker, together with recommendations for further actions.

STEP VI: This report becomes the basis for considering, at the policy-making level, what the experiment has taught regarding the continued usefulness of the ruling paradigm of social practice. Individual consultations, drawing on the embodied knowledge of the participants, continue. Steps are initiated to generalize from the experimental setting to the larger system of which it forms a part.

## Experimental Settings and Transactive Planning

Up to now, we have concentrated on how the policy researcher's core image might affect the policy maker's peripheral image.

But from our earlier discussion, we also know that the core images of the two diverge, and that no change in policy is possible without a prior change in the policy maker's core image. If policy research should, therefore, wish to influence social practice, the task is to forge a new theory of reality that, while combining the diverging core images of researcher and policy maker, transcends them both in a new synthesis. This process occurs only in the course of social practice itself. For core images of reality are substantially reorganized only through experimental learning [19].

The experimental setting constitutes an environment in which converge the separate images not only of researcher and policy maker but also of the local school officials, teachers, students, and parents who, together, constitute the Experiment and Innovation Group (E&I) that is responsible for the conduct of the experiment. This reorganization and synthesis of images occurs in the course of the action itself through the patient nurturing of person-centered dialogue and mutual learning.

This style of social practice has been called transactive planning, designating a process by which a scientifically schooled intelligence joins with the personal knowledge of the affected population in the process of social practice [20]. It is through transactive planning that social practice discovers how to deal with a specific problem. Social practice may thus be understood as a process that generates not only a new and tangible reality but also the means of acquiring new knowledge about it. Social practice is a process of generating social learning.

## Generalizing the Model: Towards a Learning Society

The question of policy research has led us from a review of a set of market models to a first exploration of the structure and logic of experimental settings for social practice. Social practice, we suggested, may best be viewed in terms of a paradigm that incorporates the idea of a transactive style of planning. The paradigm makes the important epistemological assumption

that action-hypotheses are verified as "correct" knowledge only in the course of a social practice that includes the four components of theory, values, strategy, and action. A further epistemological commitment is to the creation of a new reality and so new knowledge rather than establishing the truth-value of propositions in abstraction from the social context to which they are applied. To this extent, experiments in social practice differ from the traditional procedures of experimental science.

The question must now be faced of how the conclusions drawn from a given experimental setting may be reinserted into the ruling social paradigm that governs structures, programs, and behavior in the policy maker's world of politics (W-II in Figures 2-4). This question turns out to be the critical issue in policy research. Unless a satisfactory answer is forthcoming, social experiments "in the small" will forever remain isolated instances from which little of any consequence can be learned for the larger social practice to which they are related.

A possible solution can be approached only in stages. If we assume, as we must, that every experimental setting creates its own "world" (W-III, IV,...,n), then, perhaps, we should follow Ashby's law of "requisite variety" which states that "R's capacity as a regulator cannot exceed R's capacity as a channel of communication" [21]. Accordingly, we ought to do away with World-II altogether and shift to a model of radical decentralization in which World-II is simply "dissolved" into a very large number of separate and varied "worlds", each of which would represent a single experiment in social practice and learning.

In this formulation, each experimental setting adjusts independently to the relevant environmental disturbance. No interaction among settings is assumed to exist, nor are significant externalities generated by the individual experiment. Therefore, given a number of isolated settings, a systemic adaptation to the environment occurs simply as the sum of individual successful adjustments. Let us call this the "anarchic" solution in which policy research becomes unnecessary because World-II no longer exists.

Although the anarchic solution would allow for an enormous variety of experimental settings that may exist but not exceed

the regulator's capacity for communication, it would fail to respond to the fact that experimental settings do not, in fact, exist in isolation from each other but are joined into more encompassing networks of social practice. That which joins them is, by definition, common to all "worlds" and so constitutes a world of shared relations that must be managed in the interest of all.

To put the matter differently, the process of adjustment and experimentation in any part of the system generates certain externalities and consequences, both direct and indirect. The process of overall adaptation can then no longer be assumed to be simply the summation of individual adjustments. Research must focus on the dynamic structure of the system as a whole. Systematic relations may be strong or weak but, where they exist, the anarchic solution must be rejected as inappropriate, and we must ask: what changes are required in World-II to make this world conform more closely to the law of requisite variety in social practice?

To put the matter thus is to pass judgment on methods of present system management. It would appear that organizational environments in the United States have become too richly joined, in Ashby's phrase, so that when adaptations do occur, they generally occur too late [22]. Such an environment with its multiplicity of feedback loops, tends to be over-managed and under-controlled, and as a consequence becomes both "turbulent" and tyrannical [23].

In the United States, it is clear that World-II is not now an arrangement that effectively supports decentralized social practice except on a self-contained, self-terminating basis. Although many experiments are being conducted, present conditions are inappropriate for translating what is being learned into the larger social practice of World-II. As a result, public policies flounder, and the results they bring forth are only fortuitously in accord with expectations. Most of the time, central policies are confounded by the immense variety of local conditions. And, excessively concerned with local impacts, they frequently fail to address the questions arising from the structural relations that bind experimental settings into a larger structured whole [24]. We do not propose, because we are unable

to do so at this time, to "solve" the riddle of system-wide learning. What we can do is to suggest some conditions for policy research and social practice that we believe to be essential for a definitive solution of the problem.

First among these is a forthright commitment to the idea of social experimentation, practice, and learning as the principal method for public intervention. This means a commitment not only to decentralization in the management of change, but also to the regular and systematic use of Experiment and Innovation Groups (E&G) to carry out and assess the cost-effectiveness of social practice in experimental settings. Second is the formation of central organizations to support local experiments. This would obviate the need for the internalization of functional supports by each setting and help in achieving economies of scale that would enhance the cost-effectiveness of each experiment. And the third condition is the establishment of expanded channels of communication for the lateral diffusion of new experiences and learning among the multiple experiments themselves, letting information about them filter horizontally among them no less than vertically to central levels, thereby enriching the context of information for the realization of each experiment.

If we remain true to our model, we are forced to say that the establishment of these conditions must itself be subject to social experimentation, practice, and learning. Little would be accomplished by prolonged theoretical study in isolation from practice itself. The first step in a regeneration of World-II is, therefore, the creation of E&I units at the appropriate central levels for the purpose of creating conditions suitable for a social practice model of policy research [25].

Notes

1. D.K. Cohen and M.S. Garet, "Reforming Educational Policy with Applied Social Research," HARVARD EDUCATIONAL REVIEW 43, 1 (1975), p. 42.

2. For a comprehensive review of the literature pertaining to the question of translating knowledge into action, see J. Rothman, PLANNING AND ORGANIZATION FOR SOCIAL CHANGE: ACTION PRINCIPLES FROM SOCIAL SCIENCE RESEARCH (Columbia University Press, New York and London, 1974), Ch. 11.

3. The concept of social learning is central to E.S. Dunn, ECONOMIC AND SOCIAL DEVELOPMENT: A PROCESS OF SOCIAL LEARNING (The Johns Hopkins Press, 1971). See also J. Friedmann, RETRACKING AMERICA: A THEORY OF TRANSACTIVE PLANNING (Doubleday/Anchor, Garden City, N.Y., 1973).

4. For a thorough examination of unstructured as "wicked" problems, see H.W.J. Rittel and M. Webber, "Dilemmas in a General Theory of Planning," POLICY SCIENCES, Vol. 4 (1973), pp. 155-169. For a discussion of unstructured strategic planning problems in an organizational context, see A.G. Gorry and M.S. Morton, "Management Decision Systems: A Framework for Management Information Systems," Working Paper No. 458-70, Alfred P. Sloan School of Management, M.I.T., April 1970 (especially pp. 12-15).

5. H.A. Simon, THE NEW SCIENCE OF MANAGEMENT DECISION, Harper and Row, 1960, p. 6.

6. Ibid.

7. From J.D. Thompson and A. Tuden, "Strategies, Structures and Processes of Organizational Decision," COMPARATIVE STUDIES IN ADMINISTRATION, University of Pittsburgh, 1959.

8. Following P. Lasserre, "Planning Through Incrementalism," SOCIO-ECONOMIC PLANNING SCIENCES, Vol. 8 (1974), pp. 129-134.

9. This, at least, is the accepted norm of scientific practice. But science is a passionate quest as well, and the reality of scientific work doesn't always square with our beliefs about how it ought to be conducted. For an instance of passionate science, see J.D. Watson, THE DOUBLE HELIX: A PERSONAL ACCOUNT OF THE STRUCTURE OF THE DNA (New American Library, New York, 1969 [first published in 1968]).

10. E. Schroedinger, WHAT IS LIFE AND OTHER SCIENTIFIC ESSAYS (Doubleday/Anchor, Garden City, N.Y., 1956), pp. 196-197 first published in 1947.

11. A splendid account of these traditions is given in C.W. Churchman, THE DESIGN OF INQUIRING SYSTEMS: BASIC CONCEPTS OF SYSTEMS AND ORGANIZATION (Basic Books, New York and London, 1971).

12. D. Dubbink and I. Reiff, "University Research and Practice: an Institutional Confrontation," in ENVIRONMENT: A NEW FOCUS FOR LAND USE PLANNING, D. McAllister, Ed. (National Science Foundation, Washington, D.C., 1973), p. 249.

13. Cohen and Garet, op. cit., p. 19.

14. K.E. Boulding, THE IMAGE (University of Michigan Press, Ann Arbor, 1956).

15. G. Holton, "On the Role of Themata in Scientific Thought," SCIENCE 188, 4186 (1975); R.K. Merton, "Thematic Analysis in Science: Notes on Holton's Concept," SCIENCE 188, 4186 (1975).

16. This formulation follows Duhem's thesis that a scientist never tests a single hypothesis (H) in isolation from other hypotheses, implicit or explicit. Duhem posits: $(\sum_{i=1}^{h} H_i) \rightarrow 0, \sim 0 \rightarrow (\sim \sum_{i=1}^{n} H_i)$. A controlled experiment is, therefore, part of a larger system of activities, such as problem-solving, which is based on additional assumptions concerning man's nature, the problem of measurement, knowledge, cultural dimensions, etc. Falsifying a single hypothesis, $H_i$, need not, therefore, invalidate the whole experiment. See P. Duhem, THE AIM AND STRUCTURE OF PHYSICAL THEORY (Athanaeum, New York, 1914), and C. Laudan, "On the Impossibility of Crucial Falsifying Experience: Grunbaum on the Duhemian Argument," PHILOSOPHY OF SCIENCE 32 (1965).

17. F.J. Roethlisberger and W.J. Dickson, MANAGEMENT AND THE WORKER (Harvard University Press, Cambridge, Mass., 1939). The Hawthorne Effect refers to the Hawthorne experiment where changes in productivity and attitudes towards the job were induced, in part, because the affected employees sensed that the company was paying more attention to them in doing something different and novel. Our view here is reflected in E. Thorsrud ("Job Design in the Wider Context," in L.E. Davis and J.C. Taylor, DESIGN OF JOBS [Penguin Books, 1972, p. 153]) who, in referring to institutional change that builds on self-fulfilling prophecy, observes: "If the Hawthorne effect really works, why not use it? But let us use it systematically and on a larger scale; let us make explicit why and how we use it."

18. H.W. Riecken and R.F. Boruch, Eds., SOCIAL EXPERIMENTATION. Product of the Committee on Experimentation as a Method for Planning and Evaluating Social Intervention (Academic Press, New York, 1974), Ch. 1.

19. J. Piaget, GENETIC EPISTEMOLOGY (Columbia University Press, New York and London, 1970).

20. Friedmann, op. cit., Ch. 7.

21. W.R. Ashby, INTRODUCTION TO CYBERNETICS (John Wiley, New York, 1956), Ch. 11.

22. W.R. Ashby, DESIGN FOR A BRAIN. 2nd ed. (John Wiley, New York, 1960), pp. 205-215.

23. On the concept of "over-managed" societies, see A. Etzioni, THE ACTIVE SOCIETY: A THEORY OF SOCIETAL AND POLITICAL PROCESSES (The Free Press, New York, 1968), Ch. 17. On "turbulent" environments, see F.E. Emery and E.L. Trist, "The Causal Texture of Organizational Environments," HUMAN RELATIONS 18 (1965), pp. 21-32.

24. In recent years, federal revenue sharing has been tried to devolve the power of decisions in social programs to local units and government. This policy, which appears to be in line with Ashby's law of requisite variety, seems to deny the existence of significant national purposes in social affairs. Whether the pendulum has swung too far in the direction of decentralization and local autonomy--given the structure of politics in the United States--remains an important area for investigation.

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