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RENÉ E. MENDOZA

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1970

QUANTITATIVE GOALS AS OPERATIONAL MEASURES

OF EFFECTIVENESS FOR PUBLIC AGENCIES

APPROVED BY

Hugh L. MacIver

John W. Wood

Clinton Bennett

Walter F. Schaffer

Fred B Silberstein

DISSERTATION COMMITTEE

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QUANTITATIVE GOALS AS OPERATIONAL MEASURES OF EFFECTIVENESS FOR PUBLIC AGENCIES

CHAPTER I

INTRODUCTION

The Need for Operational Measures

The major attempt of this research is the delineation of the main concepts, assumptions and principles of a method of setting up quantitative goals as operational measures of effectiveness for public agencies. However, this can be done efficiently when the goals of public agencies are, or can be, stated in quantifiable or operational terms. The direction or progress of an agency can be gauged accurately only when goals are distinctly defined.[1] Otherwise, self-serving or

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[1]This dissertation follows largely the Weberian tradition of organization analysis, principally exemplified in Max Weber, The Theory of Social and Economic Organization, tr. by A. M. Henderson and Talcott Parsons (Oxford: Oxford University Press, 1957). Its methodological content, however, draws from the systematic critiques of the classical tradition exemplified by the following works based on empirical research: Chris Argyris, Personality and Organization (New York: Harper & Co., 1957); Rensis Likert, New Patterns of Management (New York: McGraw-Hill Book Company, Inc., 1961); James March and Herbert A. Simon, Organizations (New York: John Wiley & Sons, Inc., 1958); and O. M. McGregor, The Human Side of Enterprise (New York: McGraw-Hill Book Company, 1960).

gratuitous "evaluations" are likely to be made as rationale for seeking continued support or even increased appropriations for agency operations.

Public agency goals, unlike private agency goals, have often been couched in terms of glittering generalities. Consequently, they have been difficult to evaluate objectively and precisely. Also, the predilection agency apologists and public relations image-makers have in insisting on "intangibles" and "long-run effects" has not made it any easier to perform the necessary and obviously important task of objective evaluation.[2]

If public agency goals are stated in quantitative terms, they can allow an objective evaluation of the effectiveness and efficiency of a public agency or any of its programs. And with a few technical elaborations, automatic evaluation and adjustments can be maintained by built-in servo-mechanisms that are even now technologically feasible. The general lack of clarity, let alone quantitative character, in the statements of goals of public agencies, has made it difficult to objectively evaluate them or their programs. Attempts at evaluating public agency effectiveness and efficiency have therefore been haphazard, crisis-oriented and often a function of political interference. This is not to deny

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[2]Gerald Colm, in his introduction to Leonard A. Lecht, Goals, Priorities and Dollars: The Next Decade (New York: The Free Press, 1966), speaks of such "intangibles" as entering quantitative goals research as "restraints on policies (e.g., minimizing government regulation and controls)," p. 11.

the framework of that legitimate political control within which public agencies in a democracy are expected to operate. Political interference, then, by definition, would be dysfunctional in promoting inefficiency, waste and ineffectiveness. As an undesirable element in a public agency's operations, political interference can at least be minimized, if not totally eliminated, by making the goals quite explicit or, better yet, in quantitative form.

Admittedly, the commitment to a democratic theory of government, responsibilities of public agencies and public officials, implies a certain amount of political control.[3] However, beyond this legitimate area, political manipulation and interference can be very dysfunctional, leading to inefficiency, waste and even outright ineffectiveness. Therefore, while some amount of political control is necessary to maintain the system, too much of it, where it becomes interference rather than the desired democratic norm, is undesirable.

The desirability of rational procedures for making decisions in the resource-allocation function and activities of legislatures and other administrators is clearly implied in attempts to wisely allocate limited resources to such activities or agencies that "fulfill the most good," "do

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[3]Lecht suggests in fact that "where and how we assign priorities in a democracy is determined by political processes and by decisions of firms, unions and consumers, rather than by experts or government officials," Ibid., p. 18.

what they're supposed to do," or any other criteria, even if they are operationally vague. Decision-making procedures can avoid being too subjective by defining such criteria in terms of some measurable attribute or operations, hence make them more amenable to objectivity and precision.

Some Basic Ideas

Political organization theorists, as many other scientists, arrive at generalizations through a consistent and systematic study of particular instances with a view to discovering uniformities that may be reconstructed into a model. The model should allow identification of the basic elements and the relationships and interatction with the other elements in the system. In other words: the model must not only describe reality, it must also be predictive.

Developing a model that will identify the inter-relation of political phenomena and facilitate prediction and/or organization control is the main concern of the pragmatic political organization theorist. The factual bases upon which the model is to be built would have to be stated in the most objective, unbiased and verifiable forms. The usual difficulty which most political organization analysts encounter is the fact of their own immersion in, or commitment to some political system. Their own attitudes are therefore conditioned by their being involved in the political system they are studying, or a part of which, they are studying. Explicit recognition of these pressures,

in order to minimize their effects on the objectivity of the model, would be more than just an ethical requisite.

The main purpose of this dissertation is to present a tentative formulation of an analytical scheme and methodology which can be offered as the core of a frame of reference for the study and evaluation of a public agency and its effectiveness.

Actually, the general kind of analysis pursued in this research is one that has already been familiar to sociologists, economists and political scientists. Most public administration and planning experts have long taken for granted the desirability of quantifying goals of public agencies along similar lines that have been successful for private enterprise. While no superiority is claimed over predecessors in these fields, this writer has tried to build on their work and to synthesize a number of basic concepts, formulations and techniques that hitherto have been treated separately in the different disciplines. These efforts thus involve adaptation of successful and useful concepts, formulations and techniques from different fields as may be applicable to the analysis and evaluation of the public agency.

Most objections to attempts at quantifying social phenomena in general, or public agency goals in particular, have as a basis, the confusion or the lack of distinction between deterministic and stochastic models. To deny that they are or can be made quantifiable is only an admission of

ignorance of existing measurement scales or merely emphasizing the limitations of these existing scales in measuring what may be felt to be the more relevant dimensions of a social phenomena or of a public agency goal(s). Also, holding up the physical sciences as "deterministic" models for the social sciences equally ignores the existential levels of reality. The apparent simplicity of equations in models for physical reality is only the consequence of the relative homogeneity or uniformity of physical elements -- thus, the function of experimental manipulation is simplified and causal connections appear to be more readily inferred from analysis. What is conveniently forgotten is the scale -- as long as one speaks of classes of phenomena, on a large scale, one can appear "deterministic", e. g., two atoms of hydrogen combining with one atom of oxygen always results in water (H_2O) -- but there is never talk of which particular atoms will combine! Yet when the social scientists are urged to be precise and "deterministic" holding up the physical scientists as "models," it seems they are required to make the equivalent of "atomic" or "sub-atomic" particularism when the determinism of physical science held up to them is really on the "molecular" level and consist of generalizations besides. Heisenberg's principle of indeterminacy[4] is just as applicable to particular

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[4]W. Heisenberg, "The Development of the Interpretation of Quantum Theory 1912-29", in W. Pauli (ed.), Niels Bohr and the Development of Physics (London: Pergammon Press, 1955), passim. Also Hans Reichenbach, The Philosophical Foundations of Quantum Mechanics (University of California Press, 1944). C.f. John L. McKnight, "The Quantum Theoretical Concept of Measurement" in C. West Churchman and Philburn Ratoosh (eds.) Measurement: Definitions and Theories (New York: John Wiley & Sons, Inc., 1959), pp. 192-203.

social phenomena as it is to theorizing about sub-atomic particles. The scientists concerned with sub-atomic phenomena are more likely to be meaningful models for the social scientists than those whose interests are "supra-atomic". Sub-atomic physics relies as much on probability theory, stochastic models and the indeterminacy principle which are much more relevant and significant to the social sciences.

Even borrowing from the life sciences has been fraught with tragic flaws, the application of generic theory to specific conditions. It need only be recalled how social Darwinism[5] erroneously applied the principle that explained species, not particular individuals or groups. Borrowing systems concepts and structural-functional concepts have been however somewhat more fruitful. The model discussed in this chapter hence incorporates such elements from "systems analysis" and the "structural-functional" approaches,[6] rather than social Darwinism.

The Systems Approach

The modern systems approach is used in this study because it makes possible to develop:

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[5]Don Martindale, The Nature and Types of Sociological Theory, (Boston: Houghton Mifflin Company, 1960) pp. 162-175.

[6]See next two sections.

1. a common vocabulary unifying several of the behavioral disciplines;
2. a technique for analyzing, describing and explaining large, complex organizations that public agencies tend to be;
3. a synthetic approach where the older, analytic atomic Laplacian technique with a holistic orientation is not feasible due to the intricate interrelationships of parts that cannot be taken out of context of the whole;
4. a viewpoint that sees the public agency as a system in terms of information and communication networks;
5. the analysis of relations rather than of units or entities, emphasizing process and transition probabilities as the basis of a flexible structure with many degrees of freedom;
6. an operationally definable, objective study of purposiveness, goal-seeking system behavior, symbolic cognitive processes, and organizational dynamics in general.[7]

Kershner defines a system as "a collection of entities or things (animate or inanimate) which receives certain inputs and is constrained to act concertedly upon them to

---

[7]Adapted from Walter Buckley, Sociology and Modern Systems Theory (Englewood Cliffs, N.J.: Prentice-Hall, 1967) p. 39.

produce certain outputs, with the objective of maximizing some function of inputs and outputs."[8] By this definition, the usual representation of a system by block diagrams or flow charts takes the following form:

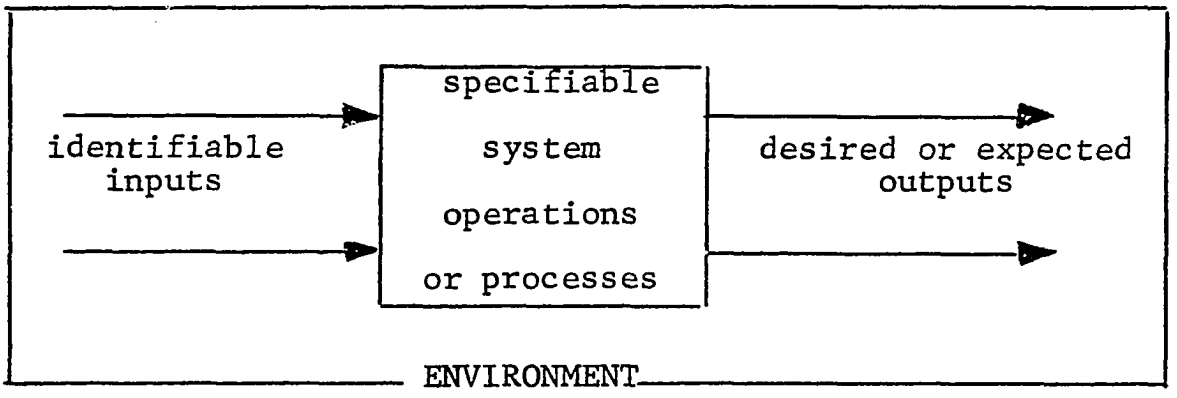

Figure 1.1. The Basic Elements of A System.

The basic elements of a system then are:

(1) identifiable inputs, of which there are three sub-categories:

   a. material -- those that enter the process, or upon which some system operation is performed; this may include people, materials, energy, information or any combination of these.

   b. environmental -- those that do not enter the process, but affect the system processes by placing limits or constraints on some or all of its operations,

   c. component replacements -- those components of the system that are replaced, as well as their replacements,

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[8]Richard B. Kershner, "A Survey of Systems Engineering Tools and Techniques," Operations Research and Systems Engineering, Charles D. Flagle, William H. Huggins and Robert H. Roy (eds.) (Baltimore: The Johns Hopkins Press, 1960), p. 41. Cf. Ira Sharkansky, Public Administration: Policy-Making in Government Agencies (Chicago: Markham Publishing Company, 1970), pp. 4-12.

(2) Specifiable system operations or processes, which can be represented by "channels" through which inputs pass, to achieve desired outputs; and

(3) desired or expected output, which is the system's product or accomplishment.[9] Clearly, the desired output can be definable by the explicit or implicit goals of the system. Goals can and should represent the operational criteria that can set stability and reliability requirements of the system. These performance standards require not only a continuity of output, but also an operational consistency of the system that can be operationally translated as minimizing the rate of errors in the system.[10]

Comparing this model with Easton's,[11] or that of Almond and Powell,[12] shows it to be a more general model which could still incorporate features of either or both Easton or Almond-Powell models. The latter two are particularistic in representing entire political structures as systems while the systems model can be represented the same entire structures as well as their component agencies, or

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[9]Stanley Young, Management: A Systems Analysis (Glenview, Illinois: Scott, Foresman and Company, 1966), pp. 16-17.

[10]Ibid., pp. 17-18.

[11]These are detailedly discussed in David Easton, A Framework for Political Analysis (Prentice-Hall, 1965) and A Systems Analysis of Political Life (J. Wiley and Sons, 1965).

[12]Gabriel A. Almond and G. Bingham Powell, Jr., Comparative Politics: A Developmental Approach (Little, Brown and Company, 1966).

even other non-profit, privately-run, privately supported public-oriented or public service agencies. Easton's specification of inputs as "demands and supports", and outputs as "decisions and activities" attests to this. The Almond-Powell model similarly does this, although terminology and focus are slightly different.

Admittedly, the prospect of developing a systems model for public agencies in general, or even for a specific public agency in particular, raises rather important considerations as to the feasibility of simulating very complicated processes that are also intricately varying in details. Obviously, the model can only simplify the public agency structure by identifying only its most important processes. The search for general, simplifying assumptions to permit description and explanation of complicated interactions or interrelationships in terms of a few variables, is thus part of the traditional scientific method. As Lackner suggests:

> The modeler, his purpose of modeling in mind, attempts to characterize phenomena, including those things he judges important, excluding those he judges insignificant. Minutiae are everywhere aggregated. In a digital simulation model, atomic attributes of phenomena are summed in a single datum, atomic actions summed in a single operation.[13]

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[13]Michael R. Lackner, "Toward a General Simulation Capability," Study of Business Information Systems (Santa Monica, Calif.: System Development Corporation), p. 14. Cf. Abraham Kaplan, The Conduct of Inquiry (San Francisco: Chandler Publishing Company, 1962), Chapter 7.

Models and Their Functions

Nearly all industries use models varying in scale, kind and purpose. The greatest value of models, however, derives from their usefulness in experimentation. The early stage of the design of nearly all manufactured items usually finds itself "translated" into some "working form" by which its essential characteristics and properties are tested. Even in the biological disciplines, the value that models have in describing and explaining biological structures or processes is in making available a more workable format (either on a larger scale or a more available form), since one cannot study biological processes without seriously altering them in one way or another -- even by the mere fact of preparing them for study.

A model is a device by which something, of considerably more complex nature, is described in terms of simple and more generalized concepts, terms or "working parts." This definition is perhaps sufficiently broad to cover the various types of models: "Mock-up" models for guns and weapons used in armed forces training programs; automobile, airplane or any other machine prototypes; replicas of the originals on a smaller scale; physical models of the Bohr atom or of the solar system; the almost life-like models of botanical and zoological materials and parts. The common property of all these can be seen in the manageability of the model taken to represent the real things that are presumably either too

large or too small, too dangerous or too inaccessible; or that may be composed of fragile material that would be damaged even as it is being prepared for observation or study.

Rosenblueth and Wiener consider a model as ". . . the representation of a complex system by a system which is assumed simpler and which is also assumed to have some properties similar to those selected for study in the original complex system."[14] Further, they point out that this "presumes that there are reasonable grounds for supposing a similarity between the two situations . . .", thus presupposing the existence of "an adequate formal model, with a structure similar to that of the two material systems."[15]

What Rosenblueth and Wiener had attempted to do for science in general, or for the physical sciences in particular, Deutsch attempted to do for the social sciences. And it is of interest to note the latter's references to the former, in giving him grounds to extend the utility that has been found so fruitful in the physical sciences, to the more fluid and more apparently erratic aspects of social behavior. Thus, he defines a model as a "structure of symbols and operating

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[14] A. Rosenblueth and N. Wiener, "The Role of Models in Science," Philosophy of Science, Vol. 12 (1945), pp. 317-318.

[15] Ibid.

rules which is supposed to match a set of relevant points in an existing structure or process."[16]

It is thus that Lackner considers a model as a caricature where "certain phenomena are grossly exaggerated in representation, while others are ignored."[17]

In a strict sense, a general model would attempt to unify findings from various disciplines that deal with differentiated fields or aspects of the same phenomean. In no way should a model be construed as forcing onto one level what should be analyzed in terms of its component and differentiated levels. To indicate at what point interrelations exist between such levels is perhaps the better value of a general model.

The value of a model lies in its unique capacity to exhibit the essential aspects of the system for which it is constructed, and its important functions and processes. Where a principle is to be explained, schematic or simulation models would be preferable, since physical models require reproductions with absolute likeness to the original and faithfulness to details. The primary functions of models therefore, are description and explanation.

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[16]Karl Deutsch, "Communication Models in Social Science," Public Opinion Quarterly, Vol. 16, No. 3 (Fall, 1952), p. 357.

[17]Lackner, loc. cit. Cf. Fred W. Riggs, Administration in Developing Countries: The Theory of Prismatic Society (Boston: Houghton Mifflin Company, 1964), Chapter 1.

The predictive function must not be overlooked although this can be taken to be essentially dependent upon, and supplementary to, the descriptive and explanatory functions. As it were, this third function only enhances the other two: the degree that the model is useful in describing and explaining determines its predictive value.

Besides these general criteria for assessing the utility of a model, three specific requirements could be posited.

The model should:

1. exhibit the essential aspects of the relation or principle under study;
2. demonstrate the working relationships of the parts or elements involved; and
3. indicate the possibility of unifying findings from various disciplines that deal with the differentiated fields or aspects of the same phenomenon.

Models of any form could be shown to have organizing and heuristic functions, although operational and predictive functions would be more difficult, even if desirable, to indicate. In any sense, no model can be expected to explain everything about the system and its processes under study. Furthermore, no model can be independent of a theory upon which it is ultimately dependent or by which it can be considered meaningful. A model is certainly different from the theory, and therefore should not be taken as a substitute

for it. The differentiation can be more adequately stated in terms of the dichotomy "explicit" vs. "implicit": Some theories may imply some particular models, and some models may have implicit theories back of them; some theories are explicit expositions of some models, and some models are explicit illustrations or aids in referring to certain points of some theories.

The Public Agency As System: A Model

Following the traditional formulation of systems analysis, a public agency as system may be represented by the following diagram:

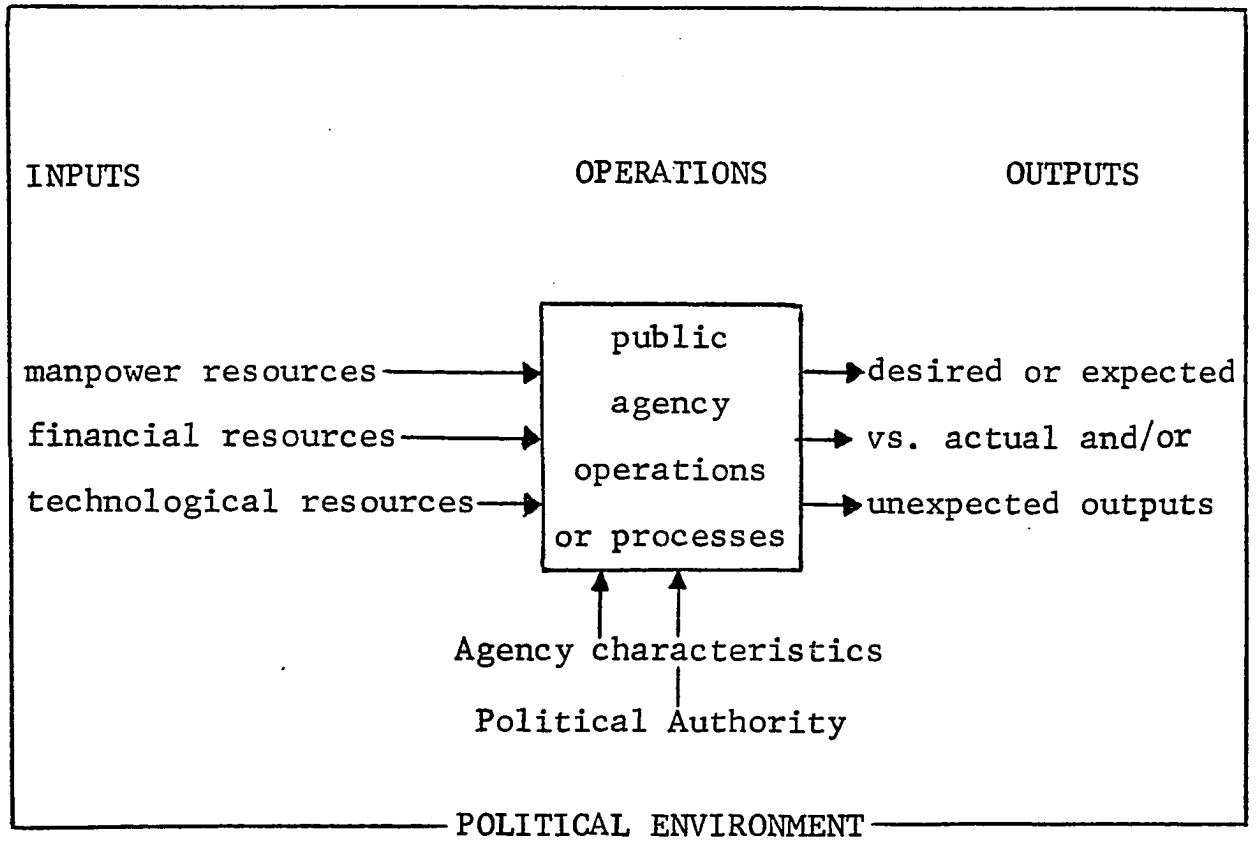

Figure 1.2. The Public Agency As System.

While the desired or expected outputs may include agency responsibility and certainly the attainment of goals, objectives or tasks of the public agency, there are other functional as well as dysfunctional "side effects" that may be anticipated. These side effects may also be desirable or undesirable. Actual outputs may be unexpected as well as expected and may include "service," "side effects" that are either functional or dysfunctional, of which propaganda is perhaps our best example. (See following diagrams Figure 1.3 and Figure 1.4, for schematic representation of these inter-relationships.)

The general model of a public agency as system represents a pre-planned structure of procedures, operations, personnel, equipment and other resources for achieving specific goals. The public agency's basic operations and the structures or components performing these operations can be delineated as the:

1. Administrative operations or structure -- which represent the greatest component or set;

2. Research and planning-- which represent an important staff function or structure, which is involved in "feedback" operations; and

3. Public relations -- the other important staff function or structure, which generates its own output as well as affects the general output of the public agency in the form of its various programs. Public relations is also responsible for the image projected by the agency to its various publics served and publics-in-contact.

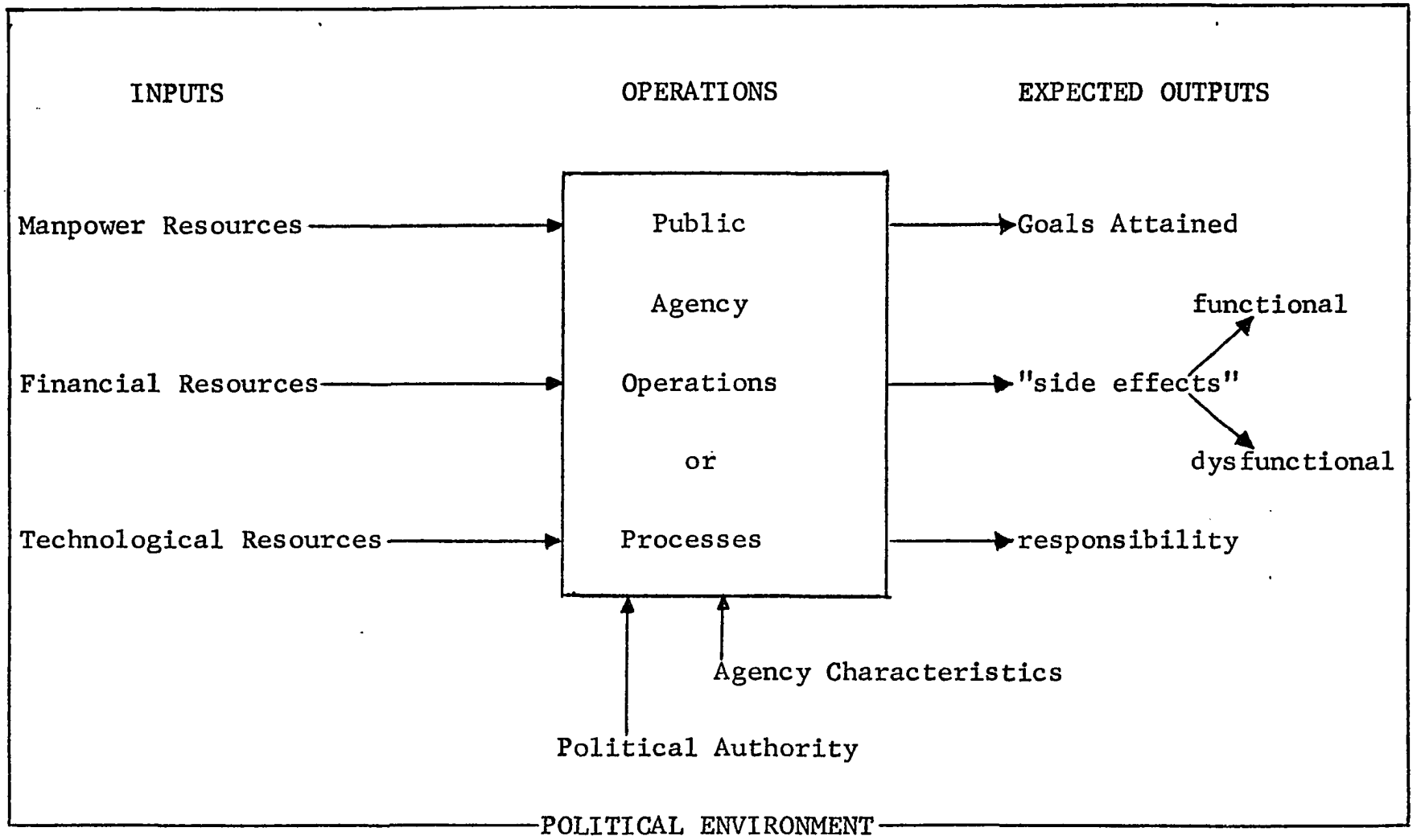

Figure 1.3. Interrelationships Between Inputs, Operations and Expected Outputs.

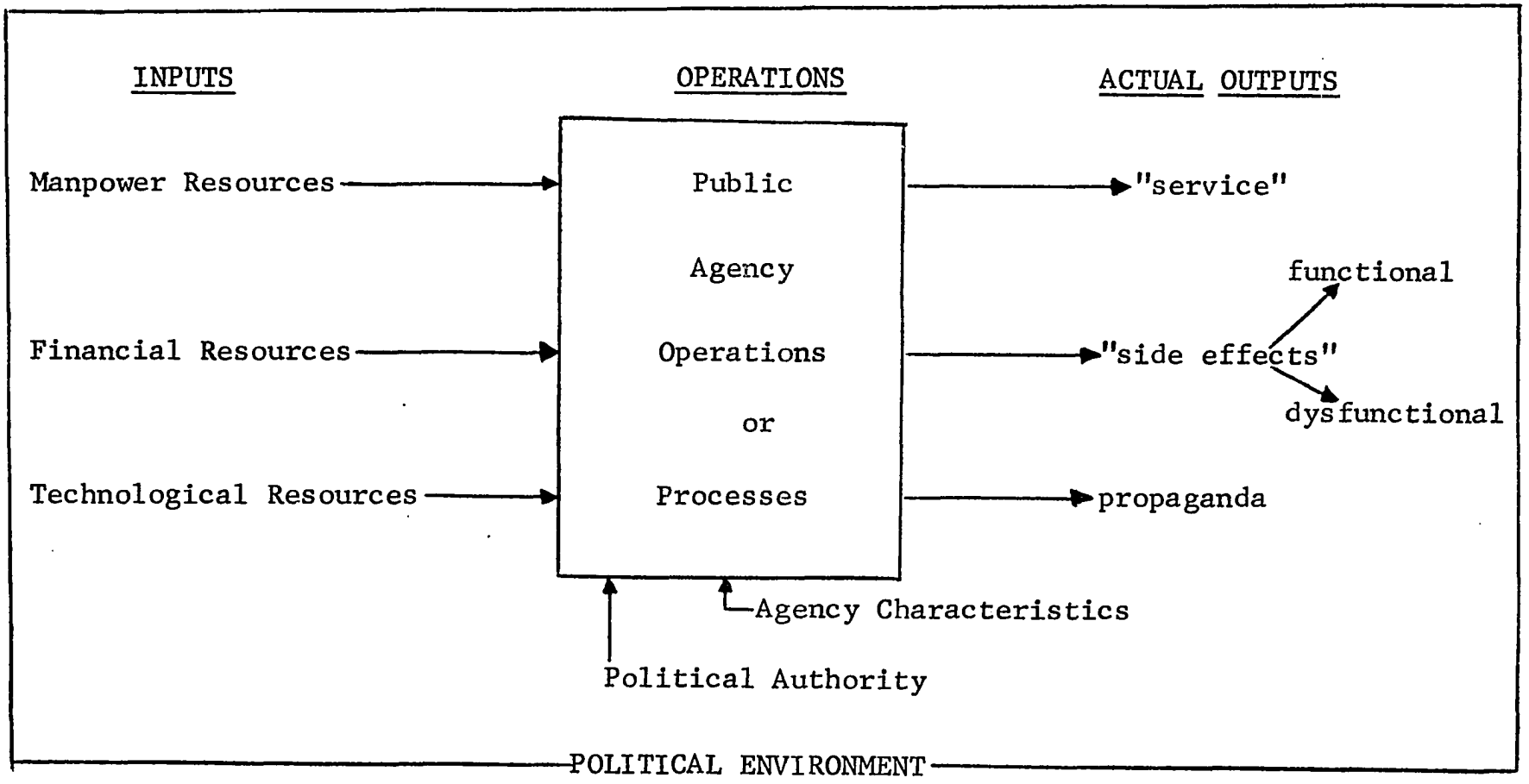

Figure 1.4. Interrelationships Between Inputs, Operations, and Actual Outputs.

This division represents a distinction in the broadest sense of functional differentiation, not necessarily a specialized staff-line distinction. In fact, it is not necessary that special personnel or sections in a public agency be designated as fulfilling these functions. It is possible that a single project can have research and planning as well as public relations implications besides fulfilling whatever object-goal it has. The distinction is made to place in proper context methodologies discussed in Chapters IV, V and VI. The diagrams on public agencies are hence representational schema denoting generalized functions and not specialized staffs or personnel. They should not be read as organizational charts even if they do look very much like them.

Administrative operations constitute the bulk of the public agency processes or structures, which are responsible for the operation and maintenance of the agency's various programs. It is also directly in charge of the research and planning as well as the public relations operations. In the model (See Figure 1.5), unbroken lines (arrows indicating direction or flow of authority, control or effect) connect components related directly to the conversion of inputs into desired or expected outputs. Broken lines represent "feedback" loops that function as standard inputs, or provide standard inputs when specially built-in as self-correcting servo-mechanisms.

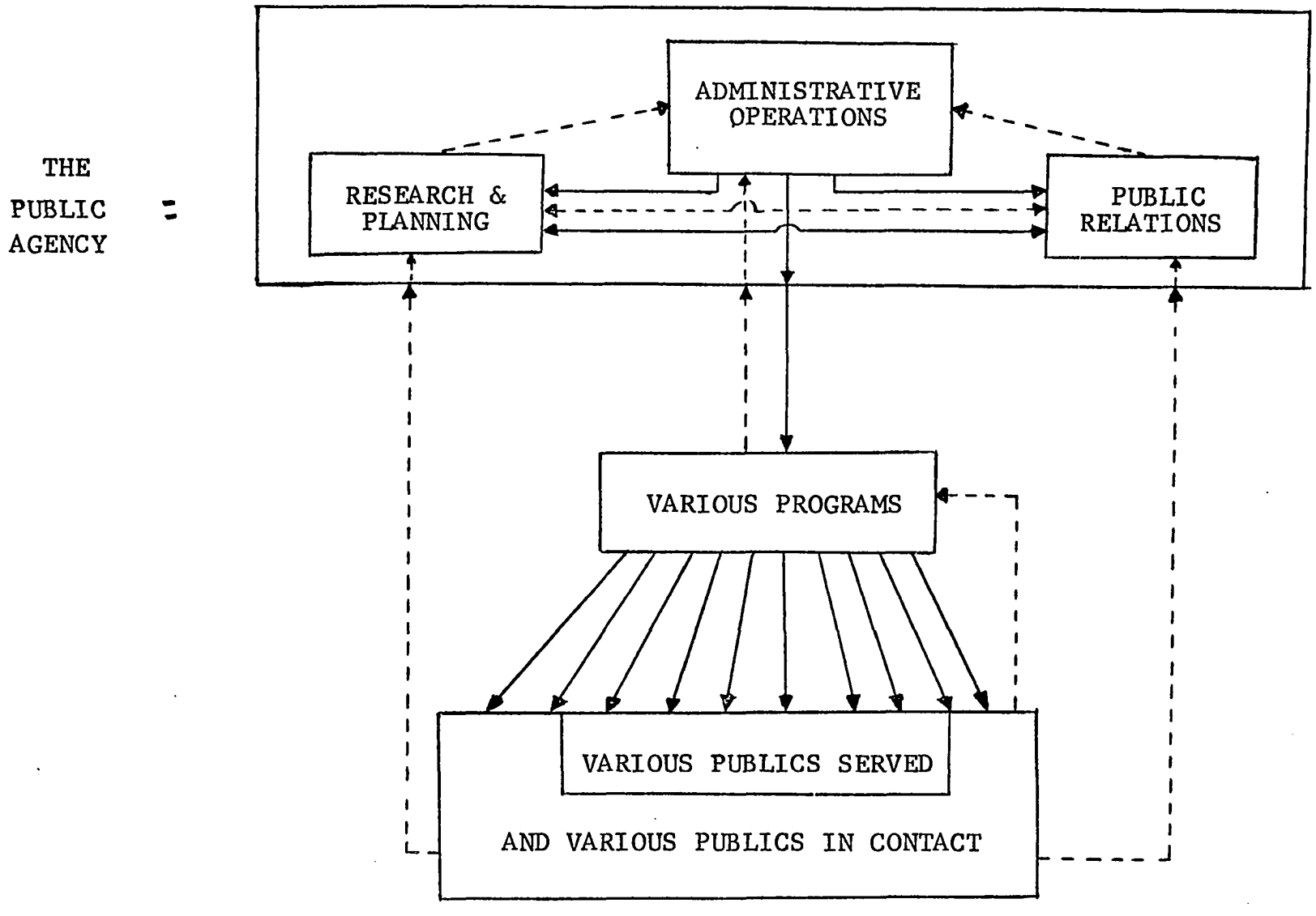

Figure 1.5. The Basic Operations of a Public Agency and Their Interrelationships.

Our analysis therefore cannot merely be descriptive -- it is, by the nature of the system, bound to be evaluative or judgmental if goals are brought into the analysis as a focusing device for agency operation. Recognizing the bureaucratic character of the public agency, it would do well to review Weber's characterization of a bureaucracy.[18] A public agency's tasks are expected to be distributed among various sections and positions as "official duties". A high degree of specialization demands and promotes expertness among hired employees, although institutional leaders may be either elected or appointed, thus giving rise to a fundamental dichotomy in leadership: the "career" types and the "political" types.

The positions and even the component sections of offices in a public agency are organized in a hierarchical structure, usually with the political types at the top of the organizational pyramid. They are responsible not only for the subordinate career types' actions and decisions, but also for their own actions and decisions to their own superiors in the organizational hierarchy. Usually, the scope of their authority is clearly delineated in administrative laws and codes, or in the legislative enactment

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[18]Weber, op. cit., pp. 329-336; and Hans H. Gerth and C. Wright Mills (trans. and eds.), From Max Weber: Essays in Sociology, (Oxford: Oxford University Press, 1946), pp. 196-204.

creating that office or agency, or else in the organization's internal rules and procedures.

Rules and regulations governing official actions and decisions may be found both external to or within the public agency. General administrative laws or codes that govern public agencies are usually the output of some legislative body outside of the public agency. The internal rules and regulations of the agency may or may not even be formally established. Ideally, these rules are expected to insure uniformity of agency operations and processes, and to facilitate coordination of the agency's various activities or the efforts of its component sections or personnel. Also, these rules, if formally established, could be expected to promote agency stability and guarantee continuity in agency operations and processes, in view of the regular turn-over of both political and career personnel.

Simon's view of administrative organizations as "decision-making structures"[19] is also quite valid for public agencies. He considers administrations as effective when they make rational decisions -- these being defined as the best alternatives for achieving any given goal. Very clearly then, because of the complexity of decision and the limitations in perception or anticipation of future consequences of actions, rationality, as Simon defines it, can never be

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[19]Herbert A. Simon, Administrative Behavior (2nd ed.; New York: Macmillan Company, 1957), pp. 1-11, 45-78, et passim.

achieved. To maximize it, however, he recommends defining responsibilities of officials, and setting up organizational mechanisms including rules and regulations, channels of command and communication, and training programs, all of which can be expected to restrict the range of alternatives an official must consider in making his decisions.

It may at first seem parodoxical that maximizing rationality in decision-making requires the restriction in the range of alternatives. If it is recalled however that a clear-cut division of labor is implied by specialization of functions in public agencies, restricting the range of alternatives for any official militates against wasteful duplication of effort and promotes adequate coverage of a much wider area of alternatives by all officials in the same public agency. The same holds true for any and all public agencies.

Rational decisions thus require an identification of goals in order to select the appropriate means to attain them. The means-goal relation may really be a complex chain, so that some intermediate goals may have to be achieved as conditions of or means to achieving some fundamental goal. These fundamental goals are often seen as value premises, rather than factual premises on which actions or decisions are ultimately based or evaluated. Factual premises, on the other hand, are expected to be the basis for decisions regarding means, or intermediate goals.[20]

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[20]Colm, op. cit., p. 11-13.

CHAPTER II

GOALS, OBJECTIVES, FUNCTIONS AND TASKS

The Problems of Goal-Determination

Many of the evaluations commonly made and accepted by evaluators of public agencies are not expressed in genuinely researchable form -- it would be most difficult, if not actually impossible, to verify them by empirical investigation. Such basic concepts as "general welfare", "serving the most good," "interests of the people (or of the community, or the state, or the region, or the nation)" are not operationally defined in that empirical referrents are not identified, or even not at all identifiable. In insisting on rather subjective impressions, most traditional evaluations of public agencies represent only nominal categorizations, rather than operational, let alone, quantitative, definitions. Unfortunately, such "nominal" evaluations take the form of false or misleading dichotomies or apparently mutually-exclusive categories, where a continuum[1] might be

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[1]In Edna E. Kramer, The Main Stream of Mathematics (Greenwich, Conn.: Fawcett Publications, Inc., 1951) a continuum is said to have a particular property of being everywhere dense, meaning that "no two terms are consecutive, but between any two terms there are always other members of the series," p. 331.

the more logical concept or frame of reference.

As Colm suggests:

> The quantification of the costs of goals in a manner which makes them comparable with resource availabilities is essential for making goals research available.[2]

Furthermore, that:

> Goals research is not directly concerned with ultimate values but with proximate values -- such as national security, individual well-being, and cultural achievements -- on which people can often agree who disagree on ultimate values.[3]

He speaks of goals that have become goals only because it has become necessary to compensate for "costs" not measured in the usual cost accounting system. For instance, there are the costly "goals" of environmental quality: "combating pollution of air and water, restoring scenic beauty, and providing for recreational facilities . . ."[4]

The pace of growth and exchanges in modern, urban, industrial society requires the identification and delineation of basic issues or areas of concern in order to make relevant and meaningful decisions regarding alternative courses of action. In the world, 80 per cent of the population is concentrated on 15 per cent of the land; while in the United States, 70 per cent of the population or 135 million people live in areas classified as urban by the Bureau of Census. By the year 2000, forty-one metropolitan areas can

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[2]Colm, op. cit., p. 11.

[3]Ibid.

[4]Ibid.

be anticipated, each inhabited by one million or more people.[5] As a professor of planning in New York University's Graduate School of Public Administration claims:

> . . . It is obvious that sound information systems, enabling man to sense problems in concentrated urban environments so that he can make such decisions as will help bring about their solutions are vital to his survival. More importantly, such information is needed as to enable man to foresee problems before they arise and to plan for their prevention and solution.[6]

Goals represent the normative element in public agencies. They represent values or ideals to which individuals or groups may be explicitly or implicitly committed. They represent the necessary stimuli that motivate and direct human, individual or collective, behavior. As directives for action, goals can provide the criteria for choices among alternative courses of action calculated to attain something desired. By defining what is desired, goals determine the nature of the means to achieve them; the specific means, however, are determined by other considerations that more probably represent factual premises than value premises.[7]

Three sets of goals may be identified as affecting public agencies. These are:

1. The goals of the agency itself,[8]

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[5]Herman G. Berkman, "Urban Planning Information Systems and Electronic Data Processing," in Geoffrey L. Cornog et al. (eds.) EDP Systems in Public Management (Chicago: Rand McNally & Company, 1968), p. 173.

[6]Ibid.

[7]Lecht, op. cit., pp. 22-27, passim.

[8]Ideally, these are identified in the legislation creating the public agency. Operationally then, legislators would be information sources for this set of goals.

2. The goals of the administrators of the agency,[9] and
3. The goals of those who are or will be affected by the agency's operation.[10]

It is not necessarily true that all these goals are compatible, even if it were more desirable that they be so. Conflicts of interests occur if they are not compatible, and are therefore, usually to be expected. Even in the stated goals of the public agency itself, this incompatibility may result in some objective(s) having to be sacrificed so that the most important one(s) may be attained. This is the important reason for establishing priorities among the goals or objectives.

The determination and identification of political goals in a constitutional system such as the state government of Oklahoma, of necessity, requires a scrutiny of the documents such as the constitution, congressional legislation and records, executive decrees, administrative orders, etc. --all of which can be expected to establish publicly-recognizable goals. However, for much smaller units of the political system, such as the Industrial Development and Park Department, or its Division of Research and Planning, doing the same may prove to be too expensive and even inefficient. It

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[9]These are to be distinguished from the goals of the agency as seen or defined by the administrators.

[10]These include not only the clientele, but all the others who are or will be affected by the agency's operations.

would be perhaps just as efficient to rely on an alternative method of determining objectives: that of using informants who are in a better position to determine goals of the public agency. Those who are more familiar with the system are more likely to provide this valuable information and insights, and therefore must be sought to be on the researcher's panel of informants.

A distinct advantage of a quantitative or operational statement of goals is that the task of rank-ordering these objectives would be less dependent on the subjective value-judgments of an informant-panel. A greater advantage would be facilitating the formulation of empirical indicators to provide operational measures of the degree to which the public agency's goals are being realized, if at all.

The task of operationalizing or quantifying a public agency's objectives does not necessarily require the persuasion of a reluctant group or individual to reveal their or his interests. Documentary research can achieve this more effectively and sometimes economically, if an informant panel is uncooperative. Also, the enabling legislation, amendments, appropriations and other congressional or any other official documents represent the objective and ultimate limits on agency operations. At times, they may even identify the goals of the agency, although in most cases, these will have to be deduced from a listing of the public agency's intended functions.

Since public agency goals place limits on, and therefore are determinants of, the nature and conduct of the public agency, they have to be stated in such terms as to make possible the measurement of agency effectiveness, and degree of efficiency by which such goals are realized, if at all. It is not necessary that these stated goals be compatible, even if it were more desirable that they be so. Conflicts of interests may occur, so that some goals may have to be sacrificed so that the more important ones may be attained. A hierarchical scale of priorities would therefore be a desirable tool for evaluating potential solutions to resolve such conflicts. An objective method of assigning weights to the goals will be technically superior to one that merely rank-orders such goals.[11] Although not as desirable as measures of the importance of goals along a well-defined scale, the weight-assigning method is at least the best method available in the absence of such well-defined scales.

Public agency officials may not necessarily be able, at the outset, to completely formulate the set of goals for their agency. As progressive reformulation of goals can be expected as the agency's programs or projects go through their phases, continuous consultation and discussion will be necessary to keep track of such new formulations of the goals of the public agency. The discovery of how the goals can, and should be, adequately formulated often occurs as research

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[11] See the next chapter for such a method.

on the organization and its programs takes better shape. And as the goals are more adequately formulated, the better will the researcher be able to direct relevant questions to the public agency's goals. The availability of informants from the public agency for consultation on a continuous basis, therefore becomes essential for maximizing the desired efficiency of goals-formulation programs.

Setting up quantifiable goals or goals reducible to empirical terms to make such measures possible, is not new to management theory.[12] Applying concepts found useful in business firms to public agencies has not been simple, for traditional views of public agencies have made it difficult to borrow principles and measures of efficiency that businesses use, even if these have been very successful. The insistence on "service" as an unquantifiable basis by which

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[12]This has been done in business management. The stress on monetary benefits provides a cost-benefit ratio which in itself makes possible an objective and quantitative criterion for evaluating effectiveness and efficiency of operations. This is the amount of profits measured in dollar or real-money terms. Also, the use of computers and electronic data processing by government agencies indicated this. Cf. Frank W. Reilly, "Policy Decisions and EDP Systems in the Federal Government," Public Administration Review, Vol. 22, No. 3 (September, 1962); Dennis G. Prince and D. E. Mulvihill, "The Present and Future Use of Computers in State Government," Public Administration Review, Vol. 25, No. 2 (June 1965); Alton G. Marshall, "The Managerial Revolution, Computer Style," in Proceedings of the Conference on EDP Systems for State and Local Governments (New York: New York University, 1964); Henry L. Willis, "The Status of ADP in City Government," in Orin F. Nolting and D. S. Arnold (eds.), The Municipal Yearbook (Chicago: International City Managers Association, 1965); and E. F. R. Hearle (ed.), Automation in Government (Chicago: American Society for Public Administration, 1963).

public agencies justify their existence and expenditures, carries with it a corresponding claim that the ordinary measures of effectiveness and efficiency used by businesses are quite "irrelevant" or "improper". By such a gratuitous assumption, administrators have often made it difficult, if not altogether impossible, to measure the effectiveness and efficiency of their agencies. Even if the agency's goals are explicitly defined in the enabling legislation, they are often couched in such vague and ambiguous language that enables administrators to subjectively define agency "success" in such terms as may be acceptable to the legislators who have to be convinced at appropriations time.

Unfortunately, even while legislators keep bemoaning the fact that it is difficult to assess which programs are worth supporting, rejecting, or the degree to which they can be legitimately supported, they too have not adapted the common measures of effectiveness and efficiency that businesses have found useful. They, too, have fallen prey to the invidious assumption that service is impossible to quantify, particularly when the administrators begin to talk about the nebulous "long-run". Historically, the role of administration and function of the administration in the large American business enterprise has been "to plan and direct the use of resources to meet the short-term and long-term fluctuations and developments in the market."[13]

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[13]Alfred D. Chandler, Jr., Strategy and Structure: Chapters in the History of the American Industrial Enterprise (Garden City, N. Y.: Doubleday & Company, Inc., 1966), p. 476.

Economists, moreover, have not been daunted by this, for, in fact, economic analysis can often be made in terms of short-run or long-run effects. This distinction can perhaps be better kept in mind when evaluating public agencies, and how effectively, economically or efficiently they achieve their goals.

If this were done, apportionment of relatively scarce resources can be done on a more rational basis. Programs, projects and agencies that achieve their goals or those that achieve them more efficiently, can thus be given priority in the allocation of financial support. On the other hand, those that do not achieve their goals or even achieve them less efficiently can be urged or forced to be more effective or more efficient by the risk of withdrawn financial support, or even a more drastic threat of scrapping the agency altogether.

It has been claimed that some functions of public agencies are so important that continued support for them is justified even if these agencies are not so efficient in achieving their goals. Unfortunately, however, this claim has also been made to support public agencies which are not even effective. Thus, effective or economical or efficient ways become difficult to institute or even devise, since the commitment of financial and human resources to the ineffectual agency represents that much waste. This also certainly precludes their utilization in more effective or efficient ways.

The proliferation of public agencies has often followed little but whimsical political considerations. At times this proliferation even defies ordinary logic and common sense. As ex-President Hoover once pointed out, "brown bears come under the Department of Agriculture, grizzly bears come under the Department of Treasury, and polar bears under the Department of Commerce."[14] This proliferation represents desires for expansion of control, and therefore, with it, prestige, influence, resources or, at least, claims to justify requests for increases in financial support. Costs have often been used as "measures" to suggest the relative importance of an agency or its functions. This, however, is very questionable, since it is possible to spend fantastic amounts ineffectively or inefficiently. Also, once established, public agencies seldom die,[15] which fact further complicates the problem of resource-utilization.

Perhaps, only when a crisis forces drastic decisions to be made, that a more rational evaluation of public agencies and their functions will be undertaken. But by then, it could also be too late. Even at this time, when political decision-makers have become committed to a more economical

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[14]P. H. Odegard, "Politics: A New Look at Leviathan" in L. White (ed.) Frontiers of Knowledge (New York: Harper and Row, Inc., 1956), pp. 94-115.

[15]Jimmy Byrnes, one-time Secretary of State and Supreme Court Justice was once reported to have observed, "The nearest approach to immortality on earth is a government bureau."

and more efficient resource-utilization, a rational method of analysis and evaluation of public agency goals has become increasingly relevant and necessary.

The Nature of Goals and Functions

Goals are conditions toward which public agency efforts or activities can, or are expected to be directed. They can represent specific conditions as well as general conditions. However, they are more amenable to quantification when specific.

Goals, as specific conditions, may represent quantifiable aspects of the more general, qualitative description of general objectives. For example, "good health" as a general goal can be broken down in terms of a more specific set of objectives or conditions including certain tolerable ranges of blood pressure, pulse rate, temperature, etc. Also, objectives, as specific conditions, can represent sequential phases or stages of development to be achieved at various time periods in attempting to direct efforts toward an ever-changing general goal. For example, one of the nation's economic goals, that of "increased production"[16] can be seen as a general goal that keeps changing even as higher and higher (specific) "target" levels or objectives are reached.

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[16]The Employment Act of 1946 sets the national economic goals of the United States as maximum employment and production, price stability and economic growth.

Goals fulfill an integrative function in providing direction and unity to group efforts and activities. Goals are, by definition, future-oriented articulations of values promoted by or for a group because members of it feel that because of the operation of moral or legal sanctions they have to conform to such values anyway, and that this conformity is required by the well-being of the group to which appropriate private sentiments are attached.[17]

Functions, from a descriptive standpoint, would be those objective consequences of structure that have directly contributed to the continued existence or success of a system.[18] To use a biological analogy, the heart is a subsystem having functions as part of the body's circulatory system, which is, in turn, contributing to sustain the larger system that is the body. The Division of Research and Planning,

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[17]Walter Fiery, "The Conditions for the Realizations of Values Remote in Time," in Edward H. Tirybing (ed.), Social Theory, Value and Sociocultural Change, (Glencoe, Illinois: The Free Press of Glencoe and Macmillan, Ltd., 1963), p. 163.

[18]The best general discussion on this concept is Robert K. Merton's "Manifest and Latent Functions: Toward the Codification of Functional Analysis in Sociology" in his Social Theory and Social Structure (rev. ed.: The Free Press of Glencoe, 1957). For Talcott Parsons' functional theory, see the first five chapters in his The Social System (Glencoe, Illinois: The Free Press, 1951). Although he has by now modified his approach somewhat, these chapters are still valuable. For Marion J. Levy Jr.'s structural-functional analysis, see his The Structure of Society (Princeton, N. J.: Princeton University Press, 1952). For a historical discussion on the sociological functionalism tradition, see chapters 17, 18 and 19 in Don Martindale op. cit., pp. 441-522.

likewise, has functions as part of the Oklahoma Industrial Development and Park Department. And as in the biological analogy, each of the Division's or the Department's functions will have to be related to the successful operation and continued existence of the much larger political system, the State of Oklahoma.

From a normative standpoint, functions would be the same as "duties". For example, the Oklahoma Session Laws of 1965, Chapter 398,[18] also known as the "Oklahoma Resources Development Act of 1965," prescribe the various duties of the Director, Associate Director and the five divisions of the Industrial Development and Park Department. These duties very clearly are directive rather than merely permissive.[19]

Functions or duties, however, are not to be confused with the goals of the organization, although the functions would provide important clues as to what the goals might be. Unlike non-public organizations, the goals of which may be more determined from or by the subjective definitions of its top administrators, the goals of public agencies can only be delineated in connection with the goals of the larger political system within which they are to be found. In this case, a Division's goals would appear to be sub-goals to be pursued in view of the goals of the

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[18] 74 O.S. Supp. 1965 § § 1101-1120.

[19] See Appendix A for complete listing of the duties of the Research and Planning Division, as a sample.

Department of which it is a component, which in turn are only sub-goals to be pursued in view of the State government's goals for the State of Oklahoma.

Now, while the State government would understandably have a number of goals for the State of Oklahoma, it is not particularly necessary that the Division's, or even the Department's goals be directed to promote all of them. In much the same way that sub-agency goals are fairly specific and the larger system's goals have increasing generality, the Division's goals would have to be delineated with respect to the Department's important goal of promoting "the development and use of the natural and human resources of the State so as to provide for a balanced, dynamic and expanding economy."[20] Two problem areas are important to recognize, to correctly delineate sub-agency goals when only functions are given. These are organizational integration and adaptation.

The extent of organizational integration represents the degree to which any sub-system (or individual) is able to obtain from other sub-systems (or individuals) the materials and services required by it to perform its proper functions. Organizational adaptation, on the other hand, represents the degree to which the larger system, as a whole, is able to obtain from other systems the

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[20] Oklahoma Session Laws, Chap. 398, Sec. 3 (74 O.S. Supp. 1965 § 1103.).

materials and services required by it to perform its proper function; i.e., the degree to which it can continue to obtain required resources from its changing physical and organizational environment.[21]

Only when an agency contributes to the organizational integration and adaptation of the larger system to which it belongs can it be said to be functional. Otherwise, when it merely hinders or impedes the larger system's processes of organizational integration and adaptation, it is dysfunctional,[22] and, therefore, represents a wasteful drain on the larger system's resources. Another useful dichotomy at this point, might be the distinction between intended or recognized functions and the unintended or unrecognized functions.[23] Public agency dysfunctions are oftentimes unrecognized, and certainly can only be unintended, unless we are willing to impute malice to legislators, public agency administrators and personnel. Understandably, some of the actual functions may not be those intended for the agency, nor anticipated by either the personnel of the agency or by the legislators when they created it. Thus the listing of functions or duties take the form of fairly general statements to provide for flexibility.

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[21]Harry C. Bredemeier and Richard M. Stephenson, The Analysis of Social Systems (New York: Holt, Rinehart and Winston, Inc., 1962), p. 42.

[22]Ibid., p. 44.

[23]Ibid., pp. 45-47. Cf. Merton, loc. cit. and Levy, loc. cit.

Quantification, however, is not antithetical to flexibility, and can perhaps avoid, or, at least minimize, the difficulties and pitfalls generated by vague generalities which hardly provide sufficient guidelines for rational operations.

Levels of Operations

First of all, it might be useful to set up a hierarchical schema by which we can offer distinctions in terms of operation levels of various public agencies, their programs or activities. While it is the individual who interacts with other individuals on the perceptual level, this interaction may actually represent different levels of operation, whether the individuals belong to the same or to different agencies or publics. Some particular groups, such as offices or sections, insofar as they may be locatable within specifiable space-time coordinates, may be similarly said to be existing on a perceptual level. But the concepts section or office are relatively abstract. In fact, they are more abstract than the concept individual since individuals make up these basic groups. Particular divisions are like offices or sections except that some of them are actually composed of sections or offices as well as composed of individuals. Thus the concept division is on about a third level of abstractness. Department is a fourth-level abstraction and executive branch is a fifth-level abstraction. All these distinctions exist on each level of a similar

hierarchy of political structures culminating in the Federal Union that the United States is, with lower levels of subsystems such as the states, counties and municipalities. (See Figure 2.1, next page.)

For example, the Research and Planning Division is technically a public agency in its own right, yet, at the same time, it is a part of the larger Industrial Development and Park Department of the State Government of Oklahoma. It is an agency in its particularity, in its being identifiable in terms of concrete individuals and sections or offices that make it up. It is an instance of planning and research agencies by being identifiable in terms of the general service function that it serves. It certainly serves other functions as well, but we do identify it principally as a staff, rather than a line, organization because of the nature of these functions. As a public agency, the functions of the Research and Planning Division, or those of the other divisions in the Industrial Development and Park Department, are listed in detail in the legislative act that created it.[24] These listings are technically prescriptions rather than merely descriptions. They may be viewed as specialized sets of functions which each should contribute to, or complement the work and activity of other divisions in the department as well as other departments of the executive branch of the Oklahoma State Government.

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[24]Oklahoma Resources Development Act of 1965, 74 O.S. Supp. 1965 §§ 1101-1120.

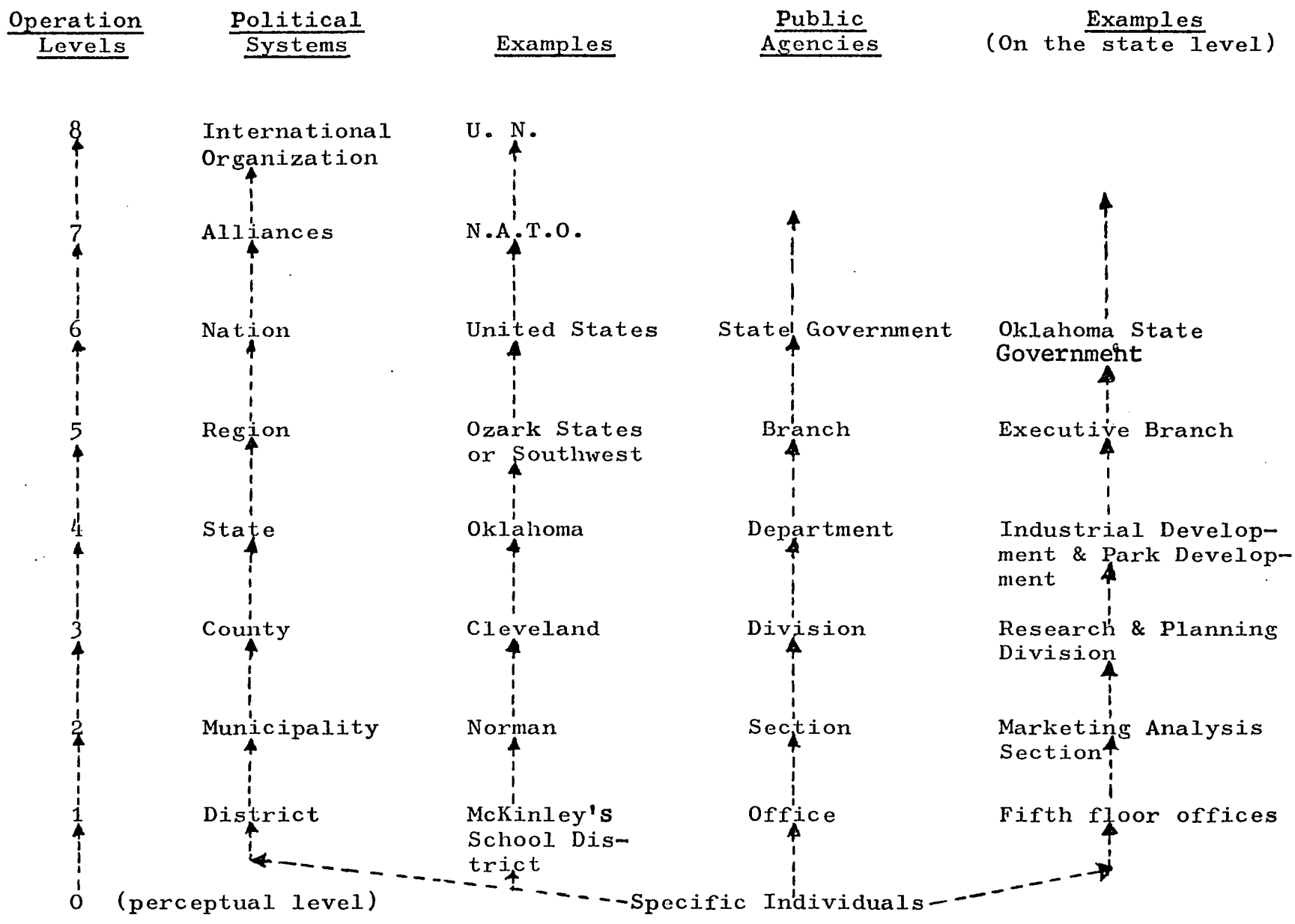

Figure 2.1. Operation Levels of Political Systems, Public Agencies and Examples of Each.

Some public agencies may represent subdivisions that cut across a state or several states along functional dimensions.[25] Other public agencies are more local in being found within communities or districts,[26] while the other public agencies only have their local branch offices or district offices in the community.[27]

The boundaries of any organization enable us to conceptualize it as a distinct unit, possible of differentiation from any other similar unit, even if they had the same members. Public agencies, as Caplow points out, may be:

1. a component of another organization--e.g., Infantry Company B in Regiment A

2. a faction in another organization--e.g., a fraternity in a school that forbids its students to join fraternities (in having separate programs activities, even if all members of the former are also members of the latter)

3. congruent with another organization--e.g., the legislature as a committee of the whole and the legislature itself (in having identical roster of members but separate identities and purposes)

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[25]An example would be the Ozarks Regional Commission that involves the States of Kansas, Oklahoma, Missouri and Arkansas.

[26]Examples would include municipal agencies, such as Oklahoma City's Fire Department, Health Department, Police Department and the city's public school system.

[27]Examples would be U. S. government district or branch offices in various cities, often located in federal buildings, such as the Internal Revenue Services or the Social Security Administration, branch or regional offices.

4. linked to another organization--e.g., most hierarchical organizations such as the military, political parties, church organizations, labor organizations and business corporations, particularly in connection with their bureaucratic substructures.[28]

The structural pattern of relations being beyond the ordinary physical plane is therefore quite inextricably interlocked with each other--and that while capable of differentiation by analysis, are not necessarily separable in any other sense from one another, than merely conceptually. So that while more than one individual is necessary for any public agency, the same individual may be involved in more than one agency.

It is merely a question of belonging to a structural pattern, so related to other elements within the same, that an individual may be said to be a participant in an organization. It is the particular relations he has with others in any group that are established in a manner peculiar and unique to the group that will constitute the defining functions of the organization. These patterned relations may take the form of the socially-oriented patterns wherein one's obligations to another and the corresponding benefits accrued thereto are indicated and defined.

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[28]Theodore B. Caplow, Principles of Organization (New York: Harcourt, Brace & World, Inc., 1964), pp. 16-17.

Relationships Between Goals

Within these contexts, different goals may be related to one another in a number of ways. They may be independent or complementary; they may be hierarchical or "nesting"; or else related in some overlapping fashion. It is easier to see goals of components of a public agency as being somewhat independent, unless related to the greater picture of the public agency's superordinate goal(s). However, in view of the superordinate goal(s), no sub-goal of any component of a public agency can be too independent! Such independence can only be an operational independence, but the achievement of such a goal may only be contributive to the general goal rather than actively complement some other goal. For instance, efficient cataloging and filing of library materials by a library section in a research and planning office may be a complementary goal to that of updating continuing research on, say, industrial capacity of the State by an industrial research section in the same agency. Logically, sequential goals are thus complementary in this sense. The same goal, however, would be independent when related to the goal of adequate and efficient staffing by the personnel section of the same office since they are not involved in any kind of sequence. Between these sections is operational independence, but their individual degree of effectiveness and efficiency would contribute to or detract from the overall effectiveness and efficiency of

the public agency of which they are components. Very clearly though, the goals of the components of the agency and those of the agency itself can be related related in a hierarchical fashion.

"Nesting" goals, on the other hand, need not necessarily involve hierarchical levels although it is relatively easy to view hierarchical goals as also "nesting". "Nesting" however can also occur for goals of the same level. Overlapping goals represent a curious combination of traits of "nesting" and complementarity. For instance, within a general goal of economic development, there are a number of overlapping sub-goals like increasing living standards, promoting public health and hygiene, increasing jobs and productivity, providing more adequate housing, and more efficient and economical transportation, etc.

Figure 2.2 uses Venn Diagrams[29] and similar devices to illustrate these types of relationships between goals. Figure 2.2.A. represents independence of goals of components of an agency on the same level, or of different public agencies. The example given earlier of goals of a library section and a personnel section fits this. The contributory character of "independent" goals actually relates them in a hierarchical fashion, so that this

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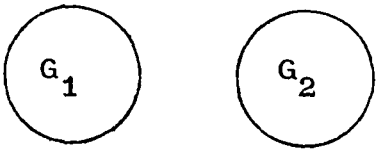
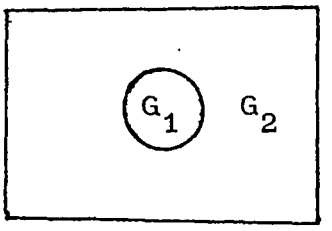
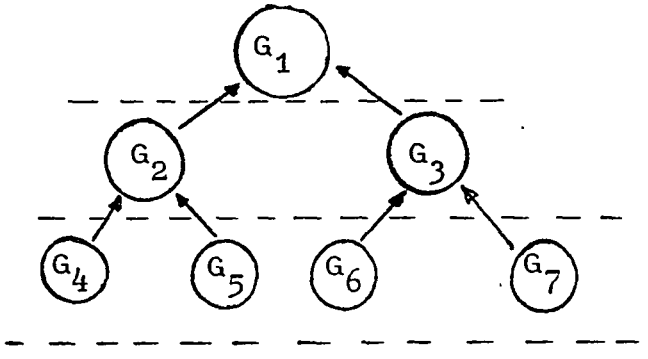
[29]Oliver Benson, in his Political Science Laboratory (Columbus, Ohio: Charles E. Merrill Publishing Company, 1969) discusses the possible uses of John Venn's adaptation of Euler's partitioning circles, for political science analysis, pp. 86-88.



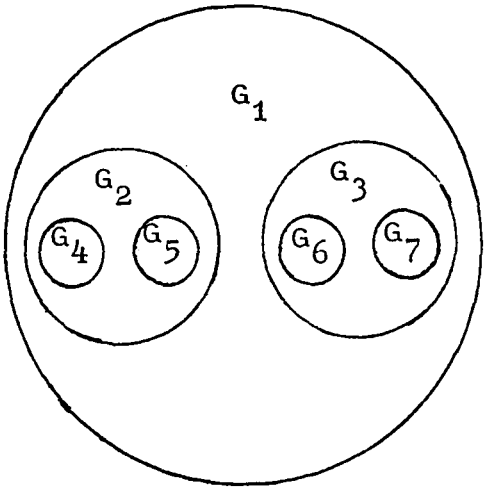
A. Independent Goals
(Same Level)



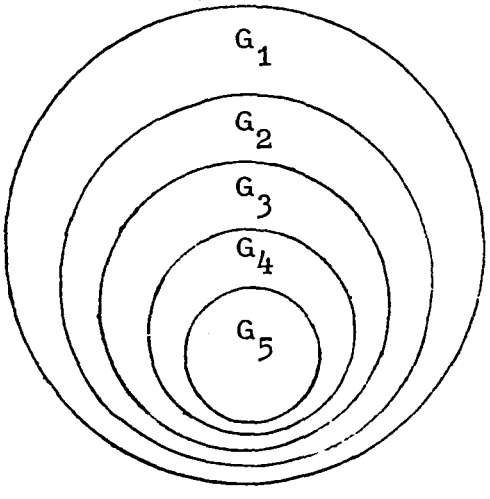
B. Complementary Goals
(Same Level)



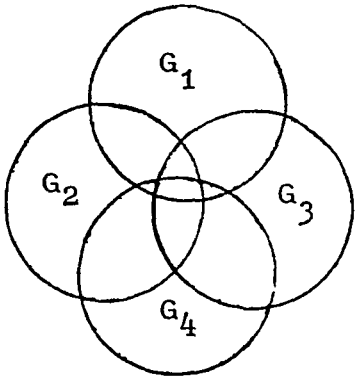
C. Hierarchy of Independent Goals
(Goals on Lower Levels Contributory to Higher Level Goals)



D. "Nesting" of Goals
(Hierarchical Levels or "Independent Goals)



E. "Nesting" of Goals
(Same Level)



F. Overlapping Goals
(Same Level)

Figure 2.2. Relationships Between Goals.

operational independence is only a function of being on the same organizational or operations level. When seen in view of this contributory character, their "independence" is submerged in the overriding goal(s) of the higher organizational or operations level. (See Figure 2.2.C.)

Sequential goals or interacting goals (see Figure 2.2.B.) can be said to be complementary. The example given about goals of a library section and an industrial research section are complementary in that efficiency in one section affects and is affected by efficiency in the other. Continued updating research on industrial capacity is possible only when materials are available when needed. Recognition of this need can be an incentive to efficient cataloging and filing of materials than a fatalistic feeling that nobody ever uses the library or cares about the order of materials in it.

Figure 2.2.C. may be illustrated by noting that the goals of components of a division like sections or offices are expected to contribute to the achievement of the goal(s) of that division; those of divisions, contributory to the goal(s) of the department of which these are components; and those of the executive departments, to the goal(s) of the executive branch of the State Government of Oklahoma. The same example can be shown to be "nesting" (see Figure 2.2.D.) by

citing actual examples of goals at these different levels. A community planning section may have a goal of helping communities in the state to receive grants and aid from appropriate federal and state agencies. A state planning section may have a goal of completing a State Airport Plan. Both these sections, as components of a Research and Planning Division, then have goals "nesting" within the division's general goal of research and planning. This goal is itself "nesting" with promotional goals of other divisions in the department, within the department's general goal of promoting industrial development. This goal in turn "nests" with still others within the present administration's goal of economic development.

On the other hand, within this top-level set of goals for the state economic development is just one goal that may "nest" within a more general resources development goal for the State of Oklahoma. And this latter goal itself also nesting within a much more overall development goal for the state. This successive nesting exemplifies Figure 2.2.E.

Overlapping goals (see Figure 2.2.F) have already been exemplified earlier[30] by noting that some sub-goals of economic development may be overlapping with increasing living standards, like providing more adequate housing, more efficient and economical transportation, promoting

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[30]See page 46 of this chapter.

public health and hygiene. Likewise, the goal of economic development may itself be only a single dimension of the state's more general development goal(s) or one sub-goal, with preventing "brain drain" or "capital flight" from the state, minimizing crime, delinquency, sickness and deaths, promoting education, etc., as perhaps other sub-goals or dimensions.

Priorities are generally set between goals on the same level rather than on different levels. Differences in levels carry with it a recognition of some fundamental ranking. Decisions, however, are made on specific levels of the public agency rather than involving different organizational levels. Thus, the problem of ranking is one appropriate to specific levels in the hierarchy.

Ordinary rank-ordering gives an elementary scale of priorities to enable rational decisions is selecting alternative courses of action that may contribute differently to the different goals.[31] This is particularly important when the decisions represent allocations of relatively scarce resources so that not all goals may be achieved and that some choice has to be made to contribute differently to the different goals. This is also just as important when the decisions represent

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[31]Ordinary rank-ordering however assumes equal intervals between goals. But considering the nature of priorities between the goals and between each of them and combinations of the others, this assumption is highly questionable.

allocations of relatively scarce resources so that if not all goals may be achieved appropriate choices can be made to maximize goal-achievement within given resource limitations. Simple rank-order is, however, too gross a scale and does not help make the finer distinctions that are often more crucial in organizational decision-making. Very clearly then, there is need for a method that produces better scaled values, since ordinary rank-ordering assumes the form of an equal-interval scale which is not too precise. This is done in the next chapter.

A Hierarchy of Goals, Objectives, Policies and Tasks

Snyder and others [32] suggest that political science lacks--or appears to lack--useful typologies, defining a typology as "a grouping of phenomena or data or analytic structures according to assumed or verified common properties."[33]

Following Snyder et al., to avoid semantic difficulties, it would be useful to introduce the concept of levels in distinguishing between organizational goals, objectives, policies and tasks on the one hand, and individual motivations and desires on the other. Instead

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[32]Richard C. Snyder, H. W. Burck and Burton Sapin, Decision-Making as an Approach to International Politics (Foreign Policy Analysis Series No. 3; Princeton, N. J.: Princeton University Press, 1954).

[33]Ibid., p. 20.

of inquiring into personal goals, which can lead to much operational difficulty with its inherently subjective dimensions, we can refer to the same as personal motivations even if they may be similarly scaled as group goals. Our interest being in public agency goals, objectives, policies and tasks, our analysis has to be group-oriented rather than individual-oriented. We are not even going to be involved in the variability in individual perceptions of group goals, except insofar as establishing this as the reason for the desirability of better communication or more adequate and reliable articulation of statements of goals (objectives, policies or tasks). Moreover, since our primary interest is in public agency goals, there are objective sources for statements about these goals, or at least, there are operational processes possible by which these goal statements can be generated.

Gordon uses a rather interesting classification providing a time-job frame of reference:[34]

Perspective	Work Designation	Time
Immediate	Task	Now-1 year
Short-Range	Purpose	1-4 years
Mid-Range	Objective	4-7 years
Long-Range	Goal	7-10 years

However, since his interests are in urban education, his terminology and the time cut-off periods do not follow

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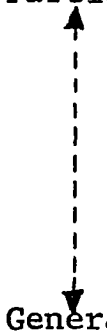
[34]Erwin E. Gordon, "A Multi-Dimensional Framework for Urban Education," MusArt, Vol. 22, No. 1 (September-October, 1969), p. 82.

political administrative and planning usage. Instead, an alternative schema may be offered incorporating current administrative and planning usage. In addition, examples of documents have been included to illustrate the nature of the missions designated as "task", "policy", "objective" or goal in an increasing order of generality or abstractness. (See Figure 2.3.)

The term "task" is used to designate immediately pressing work or missions expected to be completed within two years. This generally coincides with the common tenure period of legislative bodies such as municipal councils, some state legislatures or the federal House of Representatives. Tasks therefore represent specific, concrete and particular target conditions or situations. They are perhaps easiest to quantify or operationalize because of this specific, concrete character. But because of their particularity, they only represent the details, the minutiae of the work of a public agency, rather than setting the general direction of the agency's efforts and activities. The more general goals are still important and are necessary in evaluating these tasks. These tasks can only represent means or intermediate ends in a chain of means and ends. Or else, we may take the tasks as constituting specific conditions which contribute to, or which are preconditions required by the general target condition(s) set by the goal(s).

Policies represent the particular perceptions by any administration--local, state or national--of the goals or



Designation	Orientation	Time-Period	Examples of Documents
1. Task	Immediate	Within 2 years	Extension of water main of specific streets Project
2. Policy	Short-Term	2-4 years	Water Program
3. Objective	Intermediate	4-10 years	Investments Program Plan
4. Goal	Long-Term	10 years or more	Master or Comprehensive Plan

Figure 2.3. Mission Designations, Orientation, Time Periods and Document Examples.

objectives of their government or agency. Thus, the four-year upper limit of time coincides with the usual tenure of administrations on these local, state and federal levels. It is therefore possible for different administrations to set up and pursue different, and even contradicting, policies, even in view of having the same goals or objectives. Policies, indeed, represent an administration's ordering of priorities, so that even with the same goals or objectives, different emphasis on values may be placed on them by different administrations. Or else, continuity in policies may be the consequence of converging views or perceptions of these priorities.

Objectives are intermediate target conditions that can be completed or achieved in four to ten years. They may represent a series of tasks, a collection of tasks, or a target condition on a much more general magnitude than policies or tasks, but not as comprehensive as goals. They are still intermediate as ends, but only as means to ends representing goals. They may represent, at best, the specific, quantifiable, operational criteria by which we can judge if the more generally stated goals are achieved at all, and, if so, to what degree. Objectives then represent the breakdown of the more general goals into more specific sets of conditions which give meaning to tasks and policies, or which give direction to policies.

Goals represent the long-term general conditions that take ten or more years to complete or achieve. As a

general statement of conditions, a goal may be descriptive of ideal conditions in the abstract: conditions desired to be obtained or maintained, described in general rather than specific terms. Goals can be operationalized and even possibly quantified in terms of specific target levels, and reduced to component objectives, policies or tasks. Goals represent the broad guidelines which give general direction to a public agency's activities and efforts. Objectives are the particularized versions of the more general statements that goals represent. Policies represent the views of these goals and objectives by particular administrations that guide their decisions. Compared to goals and objectives which are generalized, policies and tasks are particularized in content and effect. It is this reason why quantification in goals research has only occurred on these lower levels, even if there has been an interchange of use of the terms goal, purpose, objective, task, mission, etc. in most of the public administration and planning literature.

CHAPTER III

QUANTIFYING GOALS FOR PUBLIC AGENCIES

Scaling Public Agency Goals

A rank-ordering of agency goals would enable administrators to evaluate potential solutions to resolve such conflicts. However, a practical method of a signing weights[1] to the goals will be considerably better than merely rank-ordering them. While this is not as desirable as measures of the importance along a well-defined scale, this "assigned-weights" method is still the best method available in the absence of such well-defined scales.

Ranking in this method is based on the assumption that between a choice of alternative goals,[2] one is more important than the other, if in the event that only one of these goals can be pursued, the other one can be sacrificed, if necessary, in order to pursue it. Since this merely recognizes that one of the alternative goals is more important than the other, without giving a measure

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[1]Adapted from Russell Ackoff, The Design of Social Research (Chicago: University of Chicago Press, 1953), pp. 24-25.

[2]This method is equally applicable to assigning values to objectives, policies or tasks.

of how much more important it is, a method of ranking that yields measures of relative importance is still necessary.

For agencies with more than two goals, the following steps can be done, assuming, of course, an adequate formulation or identification of the agency objectives:

(1) Rank the goals in order of importance. (Identify them as G_1 for the most important goal, G_n for the least important; and G_2, G_3, etc. of intermediate importance, also in the same decreasing scale.)

(2) Determine the ways in which the different goals may be related to combinations of the other goals on the basis of importance: i.e., which can be sacrificed for which?

(3) Assign the value 10 to G_1.

(4) Tentatively assign values between 10 and 0 to G_2, G_3, etc. up to and including G_n. All these values must be in descending order from 10 to 0 reflecting their relative importance.

(5) Compare G_1 with all the others combined. If there was to be a choice made between attaining or pursuing this goal or all the others, which would prevail: G_1 or

the combination of goals ($G_2 + G_3 + \ldots + G_n$)?

Two possibilities arise here:

(a) where G_1 is more important than the combination of the other goals, or

(b) where G_1 is less important than the combination of the other goals.

(5(a)) In the first situation, adjust the value (V_1) assigned to G_1, if necessary, so that it will fulfill the relation:

$$V_1 > (V_2 + V_3 + \ldots + V_n)$$

where V_n represents the values assigned to the goals so numbered.

(5(b)) In the second situation, more complicated adjustments are called for. If G_1 is less important than the combination of all the other goals, adjust its value, if necessary, to fulfill the relation:

$$V_1 < (V_2 + V_3 + \ldots + V_n)$$

Next, compare G_1 with sub-combination G_2 and G_3. If G_1 is more

important than this sub-combination then adjust the values assigned to it, if necessary, to fulfill the relation:

$$V_1 > (V_2 + V_3)$$

If, on the other hand, G_1 is Less important than the sub-combination of G_2 and G_3, then adjust the values assigned to it, if necessary, to fulfill the relation:

$$V_1 < (V_2 + V_3)$$

(6) REPEAT THESE OPERATIONS COMPARING G_1 WITH THE OTHER SUB-COMBINATIONS OF GOALS.

(7) Compare the next goal now being the next important goal with the sub-combinations of remaining goals. Perform the same operations as in (4) above. In no way should the values of succeeding goals be adjusted as to contradict any previous comparison.

(8) REPEAT FOR ALL LESSER GOALS UNTIL G_n is reached.

(9) Add up all the resulting values finally assigned to the goals and call it ΣV_i.

$$\Sigma V_i = V_1 + V_2 + V_3 + \ldots + V_n$$

(10) Assign to each goal the value equivalent to dividing the resulting V_n by ΣV_i. For instance, the first goal will thus have the value $\frac{V_1}{\Sigma V_i}$; the second, $\frac{V_2}{\Sigma V_i}$; the third, $\frac{V_3}{\Sigma V_i}$; and so on.

THE SUM OF ALL THESE STANDARDIZED FINAL VALUES SHOULD THEREFORE BE EQUAL TO ONE.

It goes without saying that this method assumes the characteristic of transitivity of the relations between goals as well as additivity between some goals and some sub-combinations of goals. Transitivity refers to that characteristic of the relations between goals such that if one goal is more important than a second goal, which in turn is more important than a third goal, then the first goal must also be more important than the third goal. Additivity, on the other hand, refers to that characteristic of relations between goals such that if a goal is more important than a combination of other goals, then it is more important than any sub-combination from the combination of goals.

All separately listed goals are to be treated as rank-ordered items. They can take the form of compounds of objectives, if such combinations are to be all achieved, rather than one in preference to the other(s) even when conditions may dictate such a choice. Listed goals can

also take the form of alternative objectives, where if any one is preferred to be fulfilled or pursued, but not all or any sub-combination, they should still be considered as a single goal rather than separate goals with the same values.

This general method can be used to assign weights to objectives, policies or tasks, provided they are drawn from the same organizational or operational level, and provided, further, that they meet the same requirements set out in this section. However, the objectives, policies or tasks may be too numerous as to make this methodology too cumbersome. Yet if they are not numerous enough to warrant the expensive computer operation, that is made technically possible by the logic of the method, or where the computer operation costs are prohibitive, an alternative procedure[3] has to be used, to approximate the results of this method.

To illustrate the application of this method of assigning weights to goals, Dr. Pat Choate, former director of the Division of Research and Planning of the Industrial Development and Park Department of Oklahoma's State Government was interviewed to supply the list of goals and their relationships as his administration saw it during his tenure as director of the state's official agency. His responses are summarized in the first two sections in the operations set on the following pages.

Obviously, it is just as feasible to have a panel of informants, allowing for either consensus or resolution of

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[3]See the next section, pp. 71-74 of this chapter.

conflicting positions or varying views on goals and/or their relationships with one another or with combinations of goals. The application of the method is still the same however the information are collected.

The general economic development goal of the State of Oklahoma can be stated in terms of establishing among relevant agencies at the various levels of state and local governments, the socio-political involvements, commitments and interdependencies required by the development of various economic sectors of the state's economy.[4] Recognizing this general goal, relatively specific objectives or policies pursued by the Bartlett administration can be delineated. Following the procedures set forth, supra, we perform the following sets of operations:

(1) List:

G_1 = Rational allocation of relatively scarce resources in the state.

G_2 = Industrial growth in the state by attracting new industries or developing those already located in the state.

G_3 = Motivating the more productive (and educated) segments of society to remain and contribute in the state.

G_4 = Centralizing the planning functions to

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[4]Interview with Dr. Pat Choate, former director of the Division of Research and Planning, Industrial Development and Park Department, State of Oklahoma, April 30, 1970.

readily locate responsibility, and have this function performed with economy and efficiency.

G_5 = Promoting respect for and prestige of the state government.

(2) Let the following statements of inequalities and/or equalities represent the priority choices derived the informant:

(2.1) $G_1 < (G_2 + G_3 + G_4 + G_5)$

(2.2) $G_1 \leq (G_2 + G_3 + G_4)$

(2.3) $G_1 > (G_2 + G_3)$

(2.4) $G_2 > (G_3 + G_4 + G_5)$

(2.5) $G_3 = (G_4 + G_5)$

(3) Set v_1 as the value of $G_1 = 10$.

(4) Set $v_2 = 4$, $v_3 = 3$, $v_4 = 2$, and $v_1 = 1$.

(5) Since G_1 is given as being less important than the combination of goals $(G_2 + G_3 + G_4 + G_5)$ in condition (2.1), change v_1 since $(v_1 = v_2 + v_3 + v_4 + v_5)$ instead of the required condition of inequality.

If $v_1 = 9$, then conditions 2.1 and (2.2) are fulfilled:

(5.1) $v_1 < (v_2 + v_3 + v_4 + v_5)$, or $9 < (4 + 3 + 2 + 1)$

(5.2) $v_1 \leq (v_2 + v_3 + v_4)$, or $9 = (4 + 3 + 2)$

(6) Since G_1 is more important than the combination $(G_2 + G_3)$ by condition (2.3), no adjustment is

necessary since:

(6.1) $v_1 > (v_2 + v_3)$, or $9 > (4 + 3)$

Similarly, in the cases of comparing G_1 with the following sub-combinations of goals, $(G_2 + G_4)$, $(G_2 + G_5)$, $(G_3 + G_4)$ and $(G_3 + G_5)$ no adjustments are necessary since:

(6.2) $v_1 > (v_2 + v_4)$, or $9 > (4 + 2)$

(6.3) $v_1 > (v_2 + v_5)$, or $9 > (4 + 1)$

(6.4) $v_1 > (v_3 + v_4)$, or $9 > (3 + 2)$

(6.5) $v_1 > (v_3 + v_5)$, or $9 > (3 + 1)$

(7) Since G_2 is given as being more important than the combination of goals $(G_3 + G_4 + G_5)$ in condition (2.4) since:

$v_2 < (v_3 + v_4 + v_5)$, or $4 < (3 + 2 + 1)$

rather than the desired condition of inequality, it will be necessary to adjust $v_2 = 7$ so that:

(7.1) $v_2 > (v_3 + v_4 + v_5)$, or $7 > (3 + 2 + 1)$.

Steps (5.1), (5.2) and (6.3) will remain unaffected by this adjustment since we still have:

(5.11) $v_1 < (v_2 + v_3 + v_4 + v_5)$, or $9 < (7 + 3 + 2 + 1)$

(5.21) $v_1 \leq (v_2 + v_3 + v_4)$, or $9 < (7 + 3 + 2)$

(6.31) $v_1 > (v_2 + v_5)$, or $9 > (7 + 1)$

Steps (6.4) and (6.5) will also not be affected since v_2 does not enter into either. Steps (6.1) and (6.2) no longer hold, since:

$v_1 < (v_2 + v_3)$, or $9 < (7 + 3)$

and:

$v_1 = (v_2 + v_4)$, or $9 = (7 + 2)$

rather than the desired conditions of inequality. It will therefore be necessary to change $v_1 = 11$ to satisfy all the conditions in the preceding steps. Thus our system of inequalities become:

(7.1) $v_1 < (v_2 + v_3 + v_4 + v_5)$, or $11 < (7 + 3 + 2 + 1)$

(7.2) $v_1 \leqslant (v_2 + v_3 + v_4)$, or $11 < (7 + 3 + 2)$

(7.3) $v_1 > (v_2 + v_3)$, or $11 > (7 + 3)$

(7.4) $v_1 > (v_2 + v_4)$, or $11 > (7 + 2)$

(7.5) $v_1 > (v_2 + v_5)$, or $11 > (7 + 1)$

(7.6) $v_1 > (v_3 + v_4)$, or $11 > (3 + 2)$

(7.7) $v_1 > (v_3 + v_5)$, or $11 > (3 + 1)$

Note that $v_1 = 10$ will not satisfy condition (5.31) since $10 = (7 + 3)$ rather than the desired condition of inequality.

(8) Repeating these operations for the following goals or policies: Since G_3 is just as important

as the combination of goals ($G_4 + G_5$) by Equation (2.5), then the values assigned can stand:

$v_3 = (v_4 + v_5)$, or $3 = (2 + 1)$

(9) $v_1 + v_2 + v_3 + v_4 + v_5 = 11 + 7 + 3 + 2 + 1 = 24$

(10) Assign to:

	The Value		(Rounded to two places)
G_1	11/24 = 0.458	or	0.46
G_2	7/24 = 0.292	or	0.29
G_3	3/24 = 0.125	or	0.13
G_4	2/24 = 0.083	or	0.08
G_5	1/24 = 0.042	or	0.04
Total	= 1.000	or	1.00

In a subsequent interview with Choate, he agreed that the assigned weights do indeed indicate the relative weights each of the goals had as far as he could intuitively tell during his tenure as director of Oklahoma's official planning agency. He further agreed that such assigned weights and their potential utility surpass the usual rank-order devices as well as the highly subjective and often covert judgments or evaluations made by administrators or policy-makers.[5]

Note that the foregoing computations and values represent merely one possible set of scale values, given certain conditions of inequality and/or equality representing

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[5]Interview with Dr. Choate, May 1, 1970.

priority choices. The list of goals or policies and the values calculated for them are not meant to be represented as the goals or policies and values attached to them of the present Bartlett administration, although arguments might be made for the possibility that these do represent actual situations. However, no such claim is made for the illustration since the information source is no longer in that capacity as director as when the research started. However *if* these indeed be accurate statements of goals or policies, ascertained by any method of goals-formulation,[6] and *if* the relations between the goals and their different combinations as posited by the equations or conditions of inequality, *then*, the values can be used as calculated in constituting a scale better than that offered by simple ranking.

The listing of actual goals or policies in a given rank-order and their relative weights compared to combinations of other goals can only be made by continuous consultations with a proper panel of informants. Their responses to follow-up questions on the goals or policies, the relationships between these goals or policies individually, or between any one of them and any combination of them, will be necessary to be able to properly assign weights to each of the goals. Due to difficulties and resistance encountered in the Division

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[6]See Section on "Sources of Goal-Statements" in Chapter VI, pp. 186-195 *infra*.

of Research and Planning and the Industrial Development and Park Department of which it is a component, no actual empirical work was done to apply the method to real conditions. The simulation example, however, should be sufficient illustration of how the method can be used, regardless of realisticness of the hypothetical formulations.

An alternative method might be a "reverse-assignment" that starts by assigning weights to the goals of least importance increasing the value of the more important goals such as will fulfill the equations and/or conditions of inequality. For instance, in our listing after the first two steps trying:

$$G_1 = 1$$

$$G_4 = 2$$

and $G_3 = 3$

fulfills the equation (2.5), as:

$$v_3 = (v_4 + v_5), \text{or } 3 = (2 + 1).$$

To satisfy condition (2.4), the minimum value required to fulfill the condition of inequality would have to be:

$$G_2 = 7$$

as:

$$v_2 > (v_3 + v_4 + v_5), \text{or } 7 > (3 + 2 + 1).$$

To satisfy condition (2.3), the minimum value required to fulfill the condition of inequality would have to be: $G_1 = 11$

as: $v_1 > (v_2 + v_3)$, or $11 > (7 + 3)$.

Condition (2.2) can be satisfied by this assignment to G_1, although other possible values can satisfy it. $G_1 = 12$ would also fulfill it, as:

$$v_1 \leqslant (v_2 + v_3 + v_4), \text{ or } 12 = (7 + 3 + 2).$$

$G_1 = 11$ however is the maximum and only value that will satisfy conditions (2.2) and (2.3), as:

$$v_1 \leqslant (v_2 + v_3 + v_4), \text{ or } 11 < (7 + 3 + 2)$$

and $v_1 > (v_2 + v_3)$, or $11 > (7 + 3)$.

Assigning $G_1 = 10$, while fulfilling condition (2.2) does not satisfy condition (2.3), as:

$$v_1 \leqslant (v_2 + v_3 + v_4), \text{ or } 10 < (7 + 3 + 2)$$

but $v_1 = (v_2 + v_3)$, or $10 = (7 + 3)$

rather than the required condition of inequality.

Obviously, condition (2.1) is equally satisfied by assigning $G_1 = 11$ as it is the maximum and only value fulfilling it (as well as all the other conditions):

$$v_1 < (v_2 + v_3 + v_4 + v_5), \text{ or } 11 < (7 + 3 + 2 + 1).$$

The last two steps of adding values and using the sum as denominator for standardizing the final weights for each of the goals would be the same. Thus, the resulting values will be the same as listed on page 67. For public agencies that have a large number of goals or policies for which weights are to be calculated, the foregoing methodology may be preferable to the first.

An Alternative Method for Scaling Public Agency Tasks[7]

A third alternative methodology, involving some type of multi-stage sampling would however be required for assigning weights to tasks since they are often more numerous than goals or policies that either of the first two methodologies become unwieldy. This other methodology may also be used if goals, objectives or policies are too numerous to make the first two methodologies unwieldy:

(1) List the entire set of tasks or objectives, ranked according to importance or priority in desirability.

(2) Randomly assign each of the tasks or objectives, into groups of no more than six, preferably resulting in equal sized groups, if possible.

(3) Select at random a task or objective from each group keeping track from which each was drawn.

(4) Perform steps (2) to (8) of the procedures described in the first methodology[8] or the equivalent steps in the second alternative methodology[9] to obtain unstandardized values for the tasks or objectives in the group formed on the basis of step (3) of this third alternative methodology. Multiply each by $n - 1$.[a]

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[7]Adapted from Ackoff, op. cit., pp. 375-376.

[8]See pp. 58-61 this chapter.

[9]Ibid., pp. 69-70.

[a]n = number of groups formed in step (2).

(5) Replace the tasks or objectives in the groups from which they were drawn, and then perform steps (2) to (8) of the procedures described in the first methodology, or the equivalent steps in the second alternative methodology on each of the groups formed on the basis of step (2) of this third alternative methodology. The values assigned to the tasks or objectives evaluated in step (4) of this methodology should not however be changed; all of the required adjustments or assignments are to be made on the values of the other tasks or objectives in each group.

(6) Compare the rankings obtained from steps (2) to (5) of this methodology with those obtained in step (1). If there is a discrepancy in rank-orders, reconsider the ranking, and if necessary proceed again from steps (2) to (6) of this methodology.

(7) Since the values obtained in step (5) are still unstandardized, they can be standardized by dividing each value assigned to a task or objective by the sum total of the values assigned to all tasks or objectives. As in the first two methodologies, the sum of all the standardized final values will be equal to one.

This third alternative methodology may be illustrated by the following simulation:[10]

(1) Suppose the following tasks have been ranked as follows: T_1, T_2, T_3, T_4. . . T_{11}, T_{12}.

(2) These tasks randomly assigned to three groups resulted in:

	Group		
	a	b	c
Tasks	T_4	T_7	T_9
or	T_{12}	T_{11}	T_3
Objectives	T_5	T_2	T_1
	T_{10}	T_8	T_6

(3) One task or objective is selected at random from each group: T_4, T_8 and T_3.

(4) Suppose the following unstandardized values are obtained: $T_3 = 20$, $T_4 = 12$ and $T_8 = 6$.

(5) Holding these values fixed, values are assigned to tasks or objectives in each of the groups formed in step (2). Suppose the results are:

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[10]It is not necessary to list actual tasks or objectives nor to indicate equations or conditions of inequality between tasks or objectives and combinations of others. The logic of the procedure remains the same whatever those particulars are and this simulation should be sufficient to illustrate this third alternative methodology.

	Groups		
	a	b	c
Tasks or Objectives	$T_4 = 12$	$T_7 = 7$	$T_9 = 5$
	$T_{12} = 3$	$T_{11} = 2$	$T_3 = 20$
	$T_5 = 10$	$T_2 = 18$	$T_1 = 24$
	$T_{10} = 4$	$T_8 = 6$	$T_6 = 9$

(6) Comparing the rank-order in step (1) with these results, we find that the ranking of T_2 and T_3 are reversed, as are those of T_{11} and T_{12}. If the original ranking were judged correct, then the values of T_2 and/or T_3 and of T_{11} and/or T_{12} would have to be readjusted in their own groups. Assume, however that in reconsidering the ranks, the ranking resulting from the values calculated in step (5) are judged correct. The values then stand, and we proceed to the last step.

(7) The values obtained in step (5) are standardized by dividing each one by 120, the sum of all the unstandardized values. The following values are obtained:

$T_1 = 0.200$ $\quad$ $T_7 = 0.058$

$T_3 = T_2' = 0.167$ $\quad$ $T_8 = 0.050$

$T_2 = T_3' = 0.150$ $\quad$ $T_9 = 0.042$

$T_4 = 0.100$ $\quad$ $T_{10} = 0.033$

$T_5 = 0.083$ $\quad$ $T_{12} = T_{11}' = 0.025$

$T_6 = 0.075$ $\quad$ $T_{11} = T_{12}' = 0.017$

Note that T_2', T_3', T_{11}' and T_{12}' represent the new rankings based on step (5) calculations and are the same as the old T_3, T_2, T_{12} and T_{11} values respectively. These standardized values all add up to one. They are not rounded to two decimal places as done in the first methodology as it would result in tied ranks for T_5 and T_6 and for T_{11} and T_{12}, which we may wish to avoid.

Measures of Efficiency and Their Use

Once weights are arrived at for specific goals or policies by the foregoing method of assigning weights, selection of appropriate courses of action from various alternative plans or projects can proceed on a more rational basis. If the efficiency by which a certain plan can achieve a given goal can be determined, then it will be a relatively simple matter of summing cross-products of assigned weights and efficiency ratings for each pair of goal and plan or course of action.[11]

For example, consider a simple situation where there are only two goals or policies, G_1 and G_2, and only two alternative plans or projects, P_1 and P_2 to be decided on. Assume G_1 has a weight of 0.6 and G_2 a weight of 0.4 (as determined by the "assigned weights" method). Assume further that P_1 has an efficiency rating of 0.3 for achieving G_1 and 0.7 for G_2, while P_2 has an efficiency rating of 0.5 for achieving G_1 and 0.2 for G_2. By

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[11]Ackoff, op. cit., pp. 30-36.

multiplying the weight of the goals or policies G_1 and G_2, by the individual efficiency ratings of each plan or project, P_1 or P_2, in achieving each goal, we get the following values:

$$P_1G_1 = 0.3 \times 0.6 = 0.18$$
$$P_1G_2 = 0.7 \times 0.4 = 0.28$$
$$P_2G_1 = 0.5 \times 0.6 = 0.30$$
$$P_2G_2 = 0.2 \times 0.4 = 0.08$$

Adding the two sets of values, we get:

$$P_1G_1 + P_1G_2 = 0.18 + 0.28 = 0.46$$
$$P_2G_1 + P_2G_2 = 0.30 + 0.02 = 0.38$$

Plan or project P_1, with a greater sum of cross-products (= 0.46) would then appear to be a preferable course of action to P_2, which has a lesser sum of cross-products (= 0.38).

In our more complex hypothetical example earlier with five goals or policies, the task of selecting from a wide variety of plans and projects would still follow the same logic. First step is a determination of efficiency ratings for each plan or project in achieving each of the goals or policies. The resulting summary might be illustrated by an "n x m" table where "n" represents the number of plans or projects in the analysis and "m" represents the number of goals or policies to be pursued.

In our simulation of economic development goals, the five goals or policies represent the "m"-dimension of the table. Let us suppose we are considering only four

plans or projects at the moment. Suppose further that only one of these plans or projects can be supported or continued due to the usual scarcity of financial resources. Assume that we have been able to determine the efficiencies of each of these plans or projects for achieving each of the goals or policies. The resulting summary can be displayed in Table 3.1.

Suppose that P_1 represents a plan or project to establish a new vocational-technical school; P_2, a plan or project to create a new state planning agency that will centralize and coordinate all research and development on the various state plans presently performed often independently by different state agencies; P_3, a plan or project to support industrial training of poverty- and other minority-groups by means of loans; and P_4, an alternative plan or project to support industrial training of poverty- and other minority-groups by means of outright grants. While the efficiency ratings were only simulated by assignment on an impressionistic basis, this is sufficient for purpose of showing how the method is to be used. Higher efficiency ratings intuitively represent plans or projects that would more efficiently achieve a given goal than others. Looking down each column then allows us to identify the plan or project that can be expected to achieve that given goal or policy compared to the others. Thus, for the first four goals or policies, it looks like a toss-up between P_1 and P_2 (see circled values in columns

TABLE 3.1

EFFICIENCY RATINGS FOR SELECTED PLANS OR PROJECTS IN ACHIEVING GOALS OR POLICIES OF ECONOMIC DEVELOPMENT

Plans or Projects	Goals or Policies				
	G_1 "Rational Allocation"	G_2 "Industrial Growth"	G_3 "Motivation"	G_4 "Central Planning"	G_5 "Prestige"
P_1 Vo-tech School	0.5	0.7	0.6	0.3	0.5
P_2 New State Planning Agency	0.4	0.8	0.5	0.9	0.4
P_3 Loans Program	0.3	0.3	0.5	0.0	0.8
P_4 Grant Program	0.1	0.2	0.1	0.1	0.7

Source: Simulation.

G_1 to G_4), with P_3 as a "winner" for the goal or policy of promoting respect for and prestige of the state government. At least, if the choices were simply that of deciding between alternative plans or projects for single goals or policies, we would not have to do much more.

But, since usual decisions have to be made considering a number of goals or policies rather than single goals or policies, it would be necessary to take note of the differential values or "weights" attached to these goals. This is where the values calculated by the "assigned weights" method come in handy. By multiplying the efficiency ratings of each of the plans or projects by the weight of the goal which its efficiency rating was derived for, we get a new, weighted efficiency rating for that plan or project.

Table 3.2 displays the result of the process of calculating products of the efficiency ratings of each project or plan and the assigned weight given to the goal or policy. The summation of these cross-products by row (representing each plan or project) is found in the last column headed "Total Efficiency". From this column it is easy to see P_2, the hypothetical plan or project creating a new state planning agency, as having the highest total weighted efficiency. (See circled value = .569) The other values circled in the first five columns coincide with the values circled in Table 3.1, since the values

TABLE 3.2

WEIGHTS OF EFFICIENCIES OF SELECTED PLANS OR PROJECTS IN ACHIEVING GOALS OR POLICIES OF ECONOMIC DEVELOPMENT

Plans or Projects	Goals or Policies					Total Efficiency
	G_1 =0.46	G_2 =0.29	G_3 =0.13	G_4 =0.08	G_5 =0.04	
P_1	.230	.203	.078	.024	.020	.555
P_2	.184	.232	.065	.072	.016	.569
P_3	.138	.087	.065	.000	.032	.322
P_4	.046	.058	.013	.008	.028	.153

Source: Table 3.1 and calculated values from pp. 63-67.

are merely standardized by multiplication of a common value.

The problem now centers on that of developing a methodology for arriving at efficiency ratings for particular courses of action to achieve certain specified goals. Efficiency is ordinarily taken to be a measure of effectiveness over time, or cost, or effort. And generally, the potential efficiency of a certain plan or project in attaining a given goal or policy is the probability that such plan or project will result in the attainment of such goal or policy. More specifically, three general measures of efficiency can be delineated for specific or specifiable tasks. (State or municipal highway departments can provide the illustrative examples of quantitative measures, although these can only be on the level of tasks, since policies, objectives and goals are relatively more complicated.):

(1) Holding the task(s) constant, the cost necessary to complete the task(s) gives a measure of cost-efficiency. For example, given certain specifications as to the length, width, thickness of paving on a roadway, time, place, nature of surfacing materials used, grading, roadbed materials, etc., the cost-estimates per unit mile of a certain class of road, or the actual costs per unit-mile or the total costs would give a measure of cost-efficiency, sufficient for comparing or evaluating different bids, processes or projects, prospectively or retrospectively.

(2) Holding the task(s) constant, the time necessary to complete the task(s) gives a measure of time-efficiency. Again, in the same example, if certain specifications were given for the task of building a road, the different time-estimates or actual time-spent per unit mile or the total time spent, would yield a measure of time-efficiency, if cost-efficiency was also the same, sufficient for comparing or evaluating different bids, processes or projects, prospectively or retrospectively.

(3) Holding the task(s) constant, the amount of effort necessary (or expended) to complete the task(s) gives a measure of effort-efficiency. In our example, such a measure of effort may be given in terms of man-hours. The number of man-hours required to complete a roadway of a given unit length, or its total length, specifying other conditions as in the other examples above, would yield a measure of effort-efficiency.

Three other alternative measures of cost-efficiency, time-efficiency and effort-efficiency can be derived from the first three efficiency-measures. The same examples can be used to illustrate them by simple arithmetic conversions.

(4) Holding cost constant, the percentage of the task(s) completed gives an alternative measure of cost-efficiency;

(5) Holding time constant, the percentage of the task(s) completed gives an alternative measure of time-efficiency; and

(6) Holding effort constant, the percentage of the task(s) completed gives an alternative measure of effort-efficiency.[12]

Each of the above measures of efficiency assume a ceteris paribus condition; i.e., all factors are the same and variations occur only in each of the cost, time, or effort factors. Obviously ceteris paribus conditions are hardly ever obtained in the real world. Efficiency-measures are hence confounded by simultaneous variations in these factors. Cost, time or effort considerations however, may be treated as goals and scaled by the methodologies in this or the previous section. The resulting values then can be used as weights that can be used as multiplier factors to properly weight the efficiency of a plan or project. The overall efficiency of a plan or project then can be the summation of cross products of the factor weights and the various efficiency-measures of each project by factor.

Quite understandably, the problem of arriving at measures of efficiency for relatively complex courses of action is much more complicated than that of devising measures of efficiency for specific or specifiable tasks. It is the same logic however, that will be the guide for developing, as well as for evaluating, whatever methodology would be discovered suitable for arriving at measures of

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[12] Ibid., p. 29.

efficiency for courses of action that represent a more complex conglomeration of tasks. This problem once more dramatizes the necessity for quantified, or at least quantifiable, goals, definitions and criteria for achieving these goals.

Measures of Inequality and Efficiency Indices

Cumulative measures of inequality would appear to be of better practical value than measures of individual inequality, not only because of the ease of their calculation but also because collection of data necessary for the latter is both impossible and unnecessary. Cumulative measures enable researchers to measure the fraction of total values held by various proportions of the population[13]--in itself a vast improvement over the aggregate measures of gross product and per capita income as used to measure economic development. As Lorentz[14] observes:

> . . . a simple plotting of wealth along one axis and the numbers of the population along another is not satisfactory for the reason that changes in the shape of the curve will not show accurately changes in the relationships of individuals.[15]

Thus, Pareto's utilization of logarithmic curves

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[13]Hayward R. Alker, Jr. Mathematics and Politics. (New York: The Macmillan Company, 1965), p. 36.

[14]M. O. Lorentz, who developed the concept and technique used to measure inequality called the "Lorentz curve", from which were derived a number of important other measures and techniques.

[15]M. O. Lorentz, "Methods of Measuring the Concentration of Wealth," Publication of the American Statistical Association. Vol. 9 [New Series], No. 70 (June, 1905), p. 216.

attempts to avoid this objection.[16] He plotted on double logarithmic paper the number of income-receiving units with incomes equal to or exceeding each designated income size. Income is marked off in logarithms of class divisions of wealth on the x- (horizontal) axis; income-receiving units, in logarithms of the number of persons on the y- (vertical) axis. Pareto's cumulative curve, unfortunately appears wanting, for two reasons: (1) the Pareto formula[17] was developed in the first place to describe only the high-income tail of the distribution[18], and (2) logarithmic curves are somewhat deceptive since they can convey to the unwary the impression of being absolute amounts when plotted.[19] Furthermore, Pareto's formula takes no account of income aggregates.[20]

Lorentz himself suggested using cumulative per cents for both the population and income variables, on logarithmic scales. He warns that in interpreting the

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[16]Vilfredo Pareto, Cours d'Economie Politic, (Lausanne, 1897) Vol. II, p. 304.

[17]$\text{Log } N = K - \log x$
Where x = size of the individual's income
N = number of income-receivers with income equal to or exceeding that income.
Plotting N against x on double-logarithmic paper gives a straight line with the slope α.

[18]Mary J. Bowman, "A Graphical Analysis of Personal Income Distribution in the United States," The American Economic Review, Vol. 35, No. 4 (September, 1945), p. 609.

[19]Lorentz, op. cit., p. 217.

[20]Bowman, op. cit., p. 609.

resulting curves: ". . . It is necessary to pay attention solely to their shape, and to ignore the actual distance from the base line."[21] This method however is also unsuitable, for even an equal distribution of income does not give a horizontal line. He then offers his own method, which is now undoubtedly the most commonly used, to measure differences in degree of income distribution inequality. His simple graphic device requires the plotting of cumulated per cents of income on the y- (vertical) axis against cumulative per cents of the population receiving that income on the x- (horizontal) axis on arithmetic rather than logarithmic paper.[22]

With this method, equally distributed incomes will result in a straight line diagonal from the zero-origin to the point of intersection of the 100% - intercepts from the x and y scales. Unequal distributions, on the other hand, while originating and ending with the same points as equal distributions, will be convex toward the origin of the abscissa. The greater degree of inequality of income distribution will be displayed in the greater convexity of the plotted curve.

The same idea was introduced by Corrado Gini at about the same time that Lorentz made his analysis of Prussian incomes. Gini's work is better contrasted with

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[21] Lorentz, op. cit., p. 216.

[22] Ibid., p. 217.

Pareto's, since he also used logarithmic, rather than arithmetic, scales. Gini uses the formula:[23]

$$\log \quad N = p + \delta \log A_x$$

where: x = size of individual income

N = number of income-receivers with incomes of x or more

and A_x = aggregate income above the level x.

Gini was thus able to take account of the numbers of incomes above given levels of the aggregates of incomes received by those above any given point. The Gini formula also allows a more adequate description of income distribution down to a much lower level than the Pareto formula. This should not however be surprising since the Gini line generated by this formula represents the correlation of the sum of a set of numbers with a weighted sum of the same numbers. The Lorentz curve also involves such a relationship. Furthermore, there is an element of serial correlation in each of the Gini line, the Lorentz curve and even the Pareto line.[24]

The slope δ of the line generated by the Gini formula, has been used, like Pareto's α, as an index of inequality in income distributions. Yntema[25] ranked seven sets of

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[23]For a discussion of Gini's formula and its relation to Pareto's, see Gini's paper "On the Measure of Concentration with Especial Reference to Income and Wealth," delivered before the Cowles Commission in 1936.

[24]Bowman, op. cit., pp. 613-615.

[25]Dwight Yntema, "Measures of the Inequality in the Personal Income Distribution of Wealth or Income," Journal of the American Statistical Association, Vol. 28 (1933).

income data according to comparative degree of inequality of each series as shown by the following statistical measures of inequality:

(1) Mean deviation from the arithmetic mean
(2) Mean difference from the arithmetic mean
(3) Coefficient of variation calculated from the arithmetic mean
(4) Coefficient of variation calculated from "standard attribute"
(5) Mean deviation of logarithms taken from the arithmetic mean of the logarithms
(6) Standard deviation of logarithms
(7) Pareto's coefficient of inequality, α and
(8) Gini's index of concentration, δ.[26]

Yntema selected the mean deviation from the arithmetic mean, the coefficient of variation calculated from the arithmetic mean, and the coefficient of variation or calculated from "standard attribute" as the "best" measures on the bases of their sensitivity to differences between income distributions and their stability under different groupings of class intervals for data from a given distribution. He considered Pareto's α as both insensitive and unstable.[27] A number of alternative measures available also allow geometric presentation which have the pragmatic value of more readily convincing policymakers who may be easily lost in the mathematical or statistical renditions of the same thing. The "ratios of advantage and difference" measured on the Lorentz curve, the slopes curve, the Schutz equal-share coefficient, and the Gini

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[26] Ibid., p. 423.

[27] Ibid., p. 395.

coefficient are all cumulative measures of inequality that are all derivable from each other.[28] They all represent measures calculated from deviations from a forty-five degree line from the zero-origin of a two-dimensional "per cent population" by "per cent total value of income or gross product" chart as depicted in Fig. 3.1.

In Fig. 3.1, the poorest half of the population is shown to have only 20% of the total value (of gross product or income), adding another quarter from the remaining half accounts for only 10% more of the total value while only the upper 10% of the population have half of the total income. See the values in parenthesis on each scale, Fig. 3.1. While this distribution is merely hypothetical, it approximates the reality of lowest income earners having a smaller proportion of the aggregate income than their proportion of all income earners. If actual data are then plotted, the result is a convex Lorentz curve, with its degree of convexity reflecting the degree of inequality in the distribution of income or product. Going along the Lorentz curve indicates in a general fashion the extent to which various groups have more or less than what might have been their proportional share, had there been complete

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[28]Alker, op. cit., Chapter 3, "Measuring Inequality", pp. 29-53, discusses these measures together with other related concepts and shows how they are related to one another and how they are derived from one another. He also has interesting applications in the areas of legislative mal-apportionment in New York, income equality before and after taxes, and racial imbalance in New Haven's Junior High Schools.

% Total Value (Gross Product or Income)

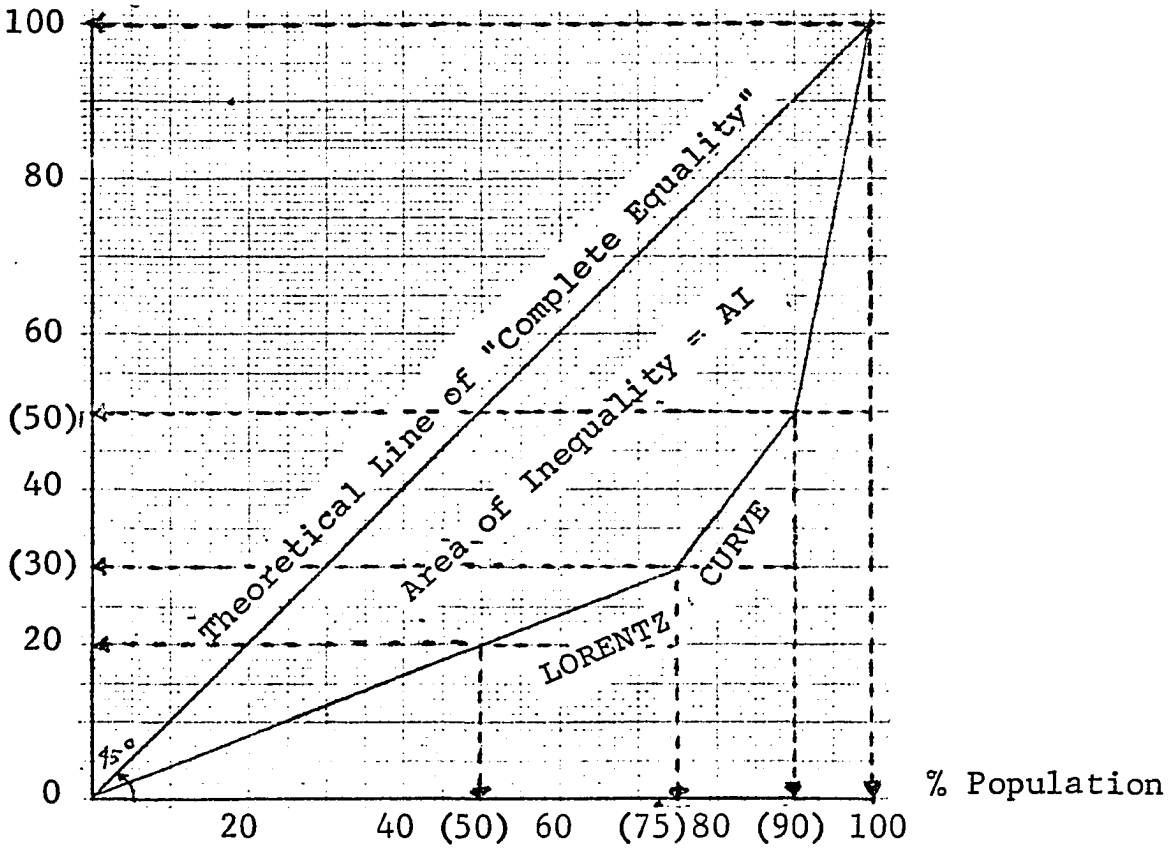

Figure 3.1. A Lorentz Curve Indicating Hypothetical Cumulative Proportions of Total Values (Gross Product or Income) Held by Cumulative Proportions of a Population.

equality. The area between the theoretical line of complete equality and the Lorentz curve, when multiplied by 2 gives rise to a simplified Gini index as a measure of inequality.[29] The slopes curve[30] and the Schutz equal-share coefficient[31] both require the translation into ratios of advantage or ratios of difference. They may be approximated visually or plotted separately, noting that a slope of a line can be obtained by dividing a vertical rise by the corresponding horizontal distance.

Benson describes a simplified derivation process to generate the Gini Index, requiring a translation of the percentage values to decimal fractions of 1.00.[32] Noting that "the diagonal curve of perfect equality cuts the grid exactly in two," he points out that "the maximum area of inequality is exactly one-half, or .5 of the entire unit square."[33] However, to obtain the area of inequality he

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[29]This is the operationally equivalent process for the more elegant equation:

$$\text{Gini index} = \frac{.50 - \text{area under the Lorentz curve}}{\text{maximum area of inequality}}$$

$$\text{which is equal to} = \frac{\text{area of inequality}}{.50}$$

[30]Alker, op. cit., pp. 36-38.

[31]Ibid., pp. 37-42.

[32]Oliver Benson, Political Science Laboratory. Columbus, Ohio: Charles E. Merrill Publishing Company, 1969, pp. 8-11. Compare this treatment with that of James Morgan, "The Anatomy of Income Distribution," The Review of Economics and Statistics, Vol. 44, No. 3 (August, 1962), pp. 270-283, particularly his appendix, pp. 281-282.

[33]Benson, op. cit., p. 8.

shows that it is simpler to calculate the area below the Lorentz curve and subtract the value from .5.

The area under the Lorentz curve is approximated by adding the areas of the triangles and rectangles constructed by dropping perpendiculars from points plotted on the graph. There will be as many triangles as points plotted (except zero-points), and one less rectangle than triangles or points. In our example in Figure 3.1 there are four points plotted, yielding four triangles and three rectangles. Their areas may be calculated by the usual geometry formulae:

$$\text{Area of Triangle} = \frac{\text{height x width}}{2} \qquad (1)$$

$$\text{Area of Rectangle} = \text{height x width} \qquad (2)$$

In our example, the calculation of a simplified Gini Index may be laid out as follows:

This per cent of the people	Have this percent of total value	Triangles h	w	A	Rectangles h	w	A
50	20	.20	.50	.0500	--	--	---
75	30	.10	.25	.0125	.20	.25	.0500
90	50	.20	.15	.0150	.30	.15	.0450
100	100	.50	.10	.0250	.50	.10	.0500
	Area Totals			.1025			.1450

Total Area Under the Lorentz Curve = .1025 + .1450 = .2475.

$$\text{Area of Inequality} = .5 - .2475 = .2525 \qquad (3.2)$$

$$\text{Gini Index} = .2525/.5 = 2 \times .2525 = .505 \qquad (3.3)$$

The Gini Index ranges from 0.00, representing a theorectical perfect inequality, to 1.00, representing a theoretical perfect equality. This index, even by itself can be used to choose between alternative plans or projects, if the impact in distribution can be calculated or estimated for them.[34] A plan or project with a lower Gini Index or that could be expected to yield a lower Gini Index could be selected, if only one goal or policy is concerned. Or, in the usual case of multi-goal situations, an efficiency rating derived from the Gini Index can be utilized in the "summation of cross-products" method discussed in the previous section.[35] One simple index may be constructed as a complement of the Gini Index, such that it plus the Gini Index equals one. We may call this an "equity index" or an "efficiency index," since "index of equality" may lead to incongrous or even, perhaps, antithetical connotation when figures are used. Thus for our example, we can calculate an Income Equity[36] Index or an Efficiency Index (presumably for

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[34]See similar studies using Gini Indices, like: Russell Ackoff and Hayward R. Alker, Karl Deutsch, Harold Lasswell, World Handbook of Political and Social Indicators (New Haven: Yale University Press, 1964); Hayward Alker, Jr., Mathematics and Politics (New York: MacMillan Company, 1965); Thomas D. Hopkins, "Income Distribution in Grants-in-Aid Equity Analysis," National Tax Journal, Vol. 18 (June, 1965), pp. 209-213; Richard I. Hofferbert, "Composition and Political Relevance of Major Socio-Economic Dimensions of the American States, 1890-1960", Midwest Journal of Political Science, Vol. 12 (August, 1968), pp. 401-418; and others.

[35]See pp. 75-81 , supra.

[36]"Equity" is preferable to "equality" because it connotes a distributive pattern without assuming equal shares. It connotes a distribution that can be proportional to some appropriate criterion.

the economic system that results in such a distribution pattern) in the following manner:

Income Equity (or Efficiency) Index = 1.00 - Gini Index (3.4)

= 1.00 - .505 = .495 $\approx$ .50

Thus speaking of an income equity index of 50 per cent or even of an efficiency index of 50 per cent avoids the unfortunate and incongrous connotations of speaking of an "equality index" of 50 per cent. This may sound to the unwary as "50 per cent equality" which would be a contradiction in terms. It might be noted that this Income Equity Index or Efficiency Index can be computed without the necessity of calculating the Gini Index. By simply multiplying the total area under the Lorentz curve by 2 we can directly derive the Income Equity (or Efficiency) Index, by-passing the steps of calculating the area of inequality, standardizing it on its maximum value of .50 and subtracting from 1.00.

When a great number of points are plotted the curve may be more "crinkly"[37] but "the more clearly do we see how the curve lies,"[38] even if "we cannot sketch the curve with a sweep of a pencil as we do with simpler graphs",[39] i.e., with fewer points plotted. Moreover, when a great number of points are plotted, calculation of the Gini Index by Benson's simplified method can be too tedious and more likely to be productive of errors.

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[37]Meaning full of shorter and shorter waves, not really a "smooth" curve.

[38]W. W. Sawyer, What is Calculus About? (New York: Random House, Inc., 1961), p. 107.

[39]Ibid.

A relatively simple computer program, of course, could be written up to do such a tedious task, but not all public agencies as yet have access to computers; or even if they do, the amount of data may not really warrant the expenditures on computer-time and programming.

Just as efficient would be a mathematical formula[40] that approximates the area under the Lorentz curve as well as Benson's simplified technique:

$$A = \frac{1}{2} \sum_{i=1}^{n-1} \left[(x_{i+1} - x_i) \cdot (y_i + y_{i+1}) \right] \qquad (3.5)$$

where: A = area under the Lorentz curve

n = the number of points plotted

x_i = the X-coordinate value at the ith point

y_i = the Y-coordinate value at the ith point

and Σ = the usual summation sign

Essentially the formula means one-half of the summation of all the cross products of the difference between every two successive values on the X-axis and the sum of the

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[40]This formula is a generalization of the usual trapezoidal rule that is used for estimating areas under a curve where the plotted points yield equal bases (on the X-axis). This formula however allows different sized bases that are more likely by empirical data in the behavioral sciences. For a discussion of the trapezoidal formula from which this is derived, see: Sherman K. Stein, Calculus for the Natural and Social Sciences (New York: McGraw-Hill Book Company, 1968), "Estimating the definite integral," pp. 254-256; and I. S. Sokolnikoff and R. M. Redheffer, Mathematics of Physics and Modern Engineering (2nd ed.; New York: McGraw-Hill Book Company, 1966), "Numerical Integration of Differential Equations," pp. 685-686. An advantage of this formula is that only the coordinates are required to approximate the area under the Lorentz curve (See the following page for a diagrammatic representation of how the coordinates can indicate bases and heights of triangles.).

two equivalent successive values on the Y-axis.[41] This is simply a more convenient way of expressing for a number of points plotted expressed by their coordinates x_i, y_i; x_{i+1}, y_{i+1}; etc.:

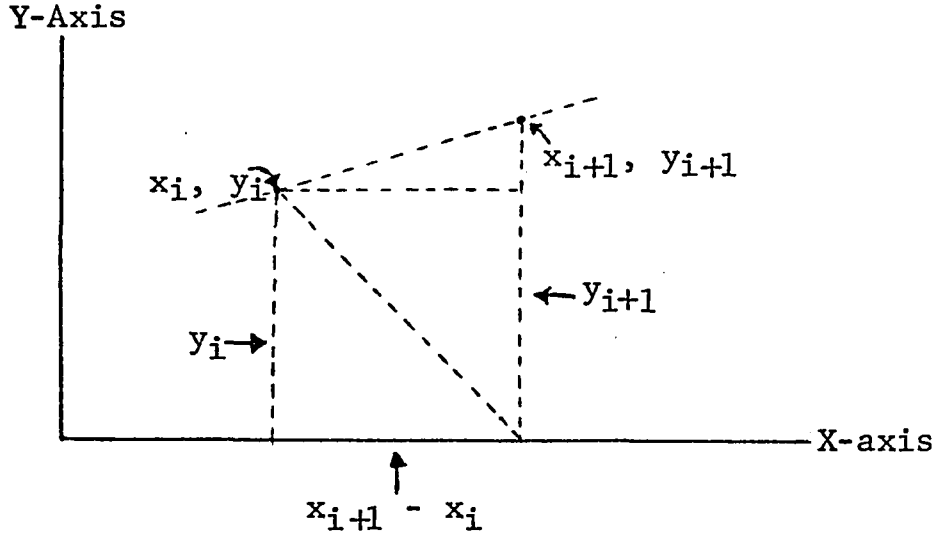
$$A = \frac{1}{2} y_i (x_{i+1} - x_i) + \frac{1}{2} y_{i+1} (x_{i+1} - x_i) + \ldots \quad (3.6)$$

which reduces to:

$$A = \frac{1}{2} (x_{i+1} - x_i) (y_i + y_{i+1}) + \ldots \quad (3.7)$$

for every pair of points x_i, y_i and x_{i+1}, y_{i+1}.

Diagramatically, we can represent these points and the resulting triangles:[42]



And for n number of points the general formula is then:

$$A = \frac{1}{2}\left[(x_{i+1} - x_i)(y_i + y_{i+1})\right] + \ldots + \frac{1}{2}\left[(x_n - x_{n-1})(y_{n-1} + y_n)\right] \quad (3.8)$$

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[41]For instance if n = 100 plotted points, the following operations are performed:

$(x_2-x_1)(y_1+y_2)+(x_3-x_2)(y_2+y_3)+ \ldots+(x_{100}-x_{99})(y_{99}+y_{100})$

the result of which is divided by 2.

[42]This should explain the coefficient $\frac{1}{2}$ in the formula since the general rule for finding the areas of triangles is: $A = \frac{1}{2}$ base x height.

which reduces to:

$$A = \frac{1}{2}\left[(x_{i+1}-x_i)(y_i+y_{i+1}) + \ldots+(x_n-x_{n-1})(y_{n-1}+y_n)\right] \quad (3.9)$$

With this value, we can proceed to calculate the Gini Index in the usual fashion or the Income Equity (or Efficiency) Index in both ways mentioned above. Actually, by the formula, we arrive at the Income Equity (or Efficiency) Index even before we figure out the area under the Lorentz curve by the formula:[43]

$$\text{Efficiency Index} = \sum_{i=1}^{n-1}\left[(x_{i+1}-x_i)\cdot(y_i+y_{i+1})\right] \quad (3.10)$$

Integration formulae are not advisable since the greater number of points are not likely to produce a smoother curve. To be able to successfully use integration formulae of the general form

$$\int_a^b f(x)dx \quad (3.11)$$

the function f(x) must be known. To try fitting a curve could be as laborious a process as the more simplified techniques discussed, supra. Moreover, there is no guarantee that the results will be any more precise or accurate than the approximations by Benson's technique and the alternative formulae (3.5) or (3.6), supra.

We could try to fit a curve for every three consecutive points (yielding "piece-wise smooth curves")

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[43]The expression $\sum_{i=1}^{n} \frac{1}{2}(....)$ is equivalent to $\frac{1}{2}\sum_{i=1}^{n}(....)$; and obviously, $2 \times \frac{1}{2}\sum_{i=1}^{n}(....) = \sum_{i=1}^{n}(....)$. Cf. p. 74 supra., for the logic of this operation.

resulting in a function $\underline{f}$ consisting of $\frac{n}{2}$ functions each defined on non-overlapping domains whose union is the domain of $\underline{f}$. However this is also just about as much laborious as the other curve-fitting methods,[44] which are also not advisable for the same reasons mentioned earlier.

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[44]Such as the method of least squares and the method of finite difference. Cf. Sokolnikoff, op. cit., pp. 673-680.

CHAPTER IV

ECONOMIC DEVELOPMENT AS AN OPERATIONAL GOAL

Goals and the Planning Function

Goals can be individual or social. For the individual, they represent the values and ideals that serve to motivate, direct and order his behavior as well as give it purpose and meaning. Not only does a personal goal express what an individual wants, it generally provides the criteria by which alternative choices can be made, with reference to either actions or satisfactions.[1] In providing an individual the reason for striving toward a goal, the goal itself satisfies certain psychological needs by giving both a meaning to activity and a rational framework within which the individual can achieve dignity or fulfillment. It can help form his self-image and thus enable him to establish more productive and more meaningful relationships with other individuals with whom he lives.[2]

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[1]Musafer Sherif and Carolyn W. Sherif, An Outline of Social Psychology (rev. ed.; New York: Harper & Brothers, 1956), pp. 152-156. Cf. Lecht, op. cit., pp. 21-23.

[2]Donald F. Roy, "Work Satisfaction and Social Reward in Quota Achievement: An Analysis of Piece-Work Incentive," American Sociological Review, Vol. 18 (October, 1953), pp. 507-514.

The prime objective of the public planning function is to coordinate the various aspects of the pertinent environment so that the inhabitants of the area can achieve their optimum possibilities. Noting that urbanization is the wave of the future; i.e., that it is inevitable, only strengthens the necessity for planning.[3] This can be done only by maximizing opportunity of both learning and actual productive performance, and minimizing the degrading, dehumanizing aspects or prospects of the crowded urban condition.

If the objective of public planning is defined in terms of creating an environment in which any member of the public can be himself and develop his capacities to the fullest extent for him to use as he sees fit, it will be clear that the physical and social structure in which he will be expected to operate, will have to be one that helps rather than hinders individual and social development.[4]

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[3]See "The Pattern of Urbanization" in Urban and Rural America: Policies for Future Growth (Washington, D.C.: The Advisory Commission on Intergovernmental Relations, April 1968), pp. 1-29. Cf. P. Wagner, The Cost and Financing of Urban Renewal and Development (Washington, D.C.: National Planning Association, 1963), p. 27; and Lecht, op. cit., chapter 4, "Urban Development," pp. 85-104.

[4]Alan Altschuler, in his The City Planning Process (Ithaca, N.Y.: Cornell University Press, 1965), speaks of an educational aspect of the goals formulation process such that discussion of social goals and objective projects to implement them can raise in slums and other "depressed" areas an awareness of the "community wherein man's human and spiritual well-being can grow and develop to the greatest degree, raising the hopes, fears and wants of all the people to those who can meet them," p. 30. Further on, he then describes the primary objective of planning as being "to educate people to expect their government to deal with more of their needs and problems."

Therefore, before any specific plans be made for a community, region, state or society, a determination of the needs and desires of the same must be made. As in the case of individuals and their personal goals, the planning goal tells what and why certain things must be done and can provide the basis for a rational and unified environment in which and to which the area inhabitants can relate in a meaningful and satisfying manner.

The commitment to democratic values furthermore requires that such a step be taken, even if only the pragmatic value of a broad base of citizen support and participation can be readily seen or appreciated by any public planner. Citizen participation in planning processes, particularly in the articulation of the initial guiding goals becomes indispensible.[5] Goal-study and goal-determination programs ultimately require not only the conceptualization, but also the operationalization, of goals, in the form of motivating ideals, objectives and policies. This process can consist of the following procedures:

1. A determination of the areas of concern that the goals are to encompass, particularly defining the effects or changes in environment anticipated or desired;

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[5]Raymond Vernon, in his The Myth and Reality of Our Urban Problems (Cambridge, Mass.: Joint Center for Urban Studies, 1961), contends that before citizen participation was considered in goals-study programs, urban problems have almost always been articulated by the elite--executives, authors, scientists, or artists--reflecting their needs and ideals, instead of those of the poor or middle class who inhabit the city, p. 10.

2. Drawing up a list of the goals in terms of the above, and a determination of the ways in which these goals are to be related to each other;

3. Specification of requisites and standards, essentially defining ideals in terms of representative standards, resulting in concrete objectives and directive policies;

4. An evaluation of the goals, resulting in some estimate or measure of their values, expressible in a list of priorities (nominal scale), rank order measures (ordinal scale) or interval scale or even ratio scale[6] measures. These in turn can be used to measure the effectiveness and efficiency of alternative courses of action designed to achieve the general goal or even some specific, particular objective.[7]

The physical, social and economic factors that are to be shaped by the goals can be determined by reviewing the present desires, projects, problem areas, functions and needs;[8] defining the ranges of responsibility and legitimate

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[6]Morris Hill, in "A Goals Achievement Matrix for Evaluating Alternative Plans," AIP (American Institute of Planners) Journal (January, 1968), (p. 24.) says:

> The nominal scale classifies and numbers entities, the ordinal scale ranks entities, the interval scale provides equal intervals between entities and indicates the differences or distances of entities from some arbitrary origin, and the ratio scale provides equal intervals between entities and indicates the differences or distance of entities from some non-arbitrary origin.

[7]Cf. R. C. Young's design for determining goals in "Goals and Goal Setting," AIP Journal (March, 1966), pp. 81 ff.; Edward F. Davis, "Goal Formulation Process in Urban Planning (unpublished Master's thesis, Graduate School, University of Southern California, 1967)"; and Hill, op. cit., pp. 19-29.

[8]Albert Mayer, in his The Urgent Future (New York: McGraw-Hill Book Company, 1967), contends that knowledge of goals can help distinguish between those elements of a subculture which are inherently valuable to the people bearing them and those "which being merely instrumental adaptations to enforced conditions, will be readily given up when circumstances change," p. 5.

concern of formulators of the planning goals in establishing who will be affected by these goals; and deciding the nature and extent of the effect desired. Statements of the areas of concern then, should contain expressions of purpose, what needs to be done and the effects anticipated with its attainment.[9]

Determining the relationships between goals is a continuous process, essentially consultative in nature. Alternative methodologies for calculating weights for goals were developed in Chapter III[10] and the resulting values derived by these methodologies can then be used as suggested in the section entitled "Measures of Efficiency and Their Use" in the same chapter.[11]

Since experiences in the economic realm are ultimately tied up with, or are to be found in, a context of social and political structures, it becomes necessary to define the objectives of such communities, or even of entire societies, in order to have an extra-systemic base for evaluating the economic impact of any public agency's operations. Reliability then can be much more readily,

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[9]Objectively accepted and implemented goals also "forestall unnecessary interferences with people's actions, reducing unanticipated consequences and mutually strengthening their related programs through workable coordination," according to Lyle C. Fitch, "Social Planning in the Urban Cosmos," Urban Research and Policy Planning, (Urban Affairs Annual Reviews, Vol. I.), ed. Leo Francis Schnore and Henry Fagin (Beverly Hills, Calif.: Sage Publishing Company, 1967), p. 332.

[10]See pp. 58-61, 63-67, 69-75, supra. for discussion and illustrations.

[11]See pp. 75-84, supra.

if not simply, defined in terms of such objectives, rather than going off into a futile search for some value "universals"--usually in the form of "glittering generalities"--which sanction the public agency operation.

Obviously, part of the statement of goals or objectives would be a specification of the extent to which individuals are to be benefited by the activities being planned. The question of "workability" can then be thrown back to the original objective as to who is to benefit: some? all? a majority? who? The degree to which this coverage may be approximated will also suggest the relevance of the public agency to the particular situation, social, political or economic, to which its efforts and activities are addressed.[12] But if a goal or objective of society or of the community is either obscured or even questioned, then a more comprehensive overview of society including this component would have to be a necessary, logical, even if difficult, step.

It certainly gets to be a much more complicated problem if the planners attempt to find a universal goal or objective for the community that is common to all communities in the region or the state or the nation; or worse

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[12]Hill, op. cit., warns that while the benefits can be computed referring to different planning objectives, "the benefits and costs (of these different objectives) are not necessarily additive or comparable," p. 22. This is why the alternative methodologies for assigning weights to goals or objectives are indispensible.

yet, one that is common to all societies or that which can be shown to be assumed in all societies. In which case, the question of "who is to benefit?" enters still another area. This is no longer a social, but, perhaps more correctly, an ethical mystique which definitely implies some basic philosophical commitment assumed in the system or by the planning process. This, in any event, must be recognized by the professional planners. While it can readily be granted that value-judgments of the sort seem inevitable, they need not enter into the analysis of theories and their special or particular consequences, except perhaps insofar as they can be demonstrated as functional prerequisites of some sort.

It can be suggested somehow, that there are no universal economic solutions; but rather, that there are only technological alternatives possible within given limits of any situation. The problem of the planner is in the area of evaluation of courses of action, within a given set of constraints or limitations, that would best achieve the stated or assumed objective of that community or society. For other than this, it would be too difficult to justify the efforts of the planner without falling into some sort of circular or fallacious reasoning. The attempt to evaluate without any objective or quantitative operational criterion could easily become purely speculative--in which case, any guess would perhaps be as good as any.

Planners and economists have only recently began to realize that advocacy of unlimited growth can be disastrous; and an examination of the various constraints or factors affecting the system would be imperative as preceding the task of formulating the goals-program.[13]

The problem of reliability or applicability, on the other hand, presents a totally new dimension or approach. While the problem of validity requires only an internal check of the plan and the problem of consistency also an internal check and a search for possible contradictory elements, the problem of reliability is concerned with the applicability of the plan to the situations and conditions found and anticipated.[14] And this is a test for which time has no convenient or reliable substitute, for even the much vaunted computer simulation can only be probability or stochastic approximations of what might happen in time. A planner therefore can only think in terms of contingency operations; or else risk rigidity of a plan based on a set of assumed conditions which may not be present or which may not come about. Thus the pragmatic value of specifying conditions or assumptions which a

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[13]Mayer, op. cit., p. 3.

[14]Albert Z. Guttenberg, in "The Tactical Plan," Explanations in Urban Structure (Philadelphia: University of Pennsylvania Press, 1964), says that it may be more realistic for a planner to prepare a "tactical plan" which emphasizes the means necessary to achieve the goals agreed upon even if by so doing he would be"subjecting the long range objective to the contradictions of time by programming and putting into effect intermediate arrangements which contribute to the realization of these objectives."

plan is only good for becomes quite clear. This "hedging" seems to absolve the planner from worrying about conditions changing, for that will justify calling for another plan, rather than performing the more difficult, even if more desirable, task of building contingency alternatives into the plan. Certainly, there are some events that cannot be anticipated; and in these areas, specifying assumptions or limiting conditions would be quite legitimate. Thus, the traditional assumptions of "no major war", "no major economic depression", "no major natural disaster", etc. But predictable conditions or problem areas, even if they were of crises proportions have to be taken into consideration for any meaningful planning activity. This requirement merely points out the necessity of research and adequate data gathering facilities and activities as a prior or continuing appurtenance to the planning function.

Economic Development as a Quantitative Goal

Regardless of the form in which the goals of planning for an area (like a city, or a standard Metropolitan area, or a region or a state, or even a nation) may be delineated, it will be apparent that they will be reducible to a general condition of economic development. This can be seen as a desirable goal in itself, as well as a precondition for the more specific goals relating to housing, public health and welfare directly, and not so directly to the allied social

conditions or problem areas such as poverty, crime, delinquency, etc. -- all of which are subjects of planning of some national or local planning agency.

As a goal, economic development can be stated in the classical gross terms: increase in gross product and increase in real per capita income. These however, are often described as insufficient on two counts: (1) it offers no measure of the distribution of such increase in gross product or of per capita income, and (2) it still has to be translated in terms of conditions or situations that will be meaningful to the individual citizens. Certainly, it is possible to increase the gross product and the per capita income in a number of ways, without really having the desired impact on a large number of citizens in the area. For instance, if the rich get a lot richer, this will be reflected in increases in both gross product and per capita income, with hardly any effect on the poor peoples' capacity for improving themselves.

What is needed then, is a measure of distribution of value, which, when considered with the two other measures, can improve the operational definition of economic development. In turn, this operational definition will enable us to derive more meaningful and perhaps even measurable criteria for evaluating any program or agency that is charged with the duty of working toward the achievement of this goal of economic development. Another way of putting it might be:

Program or agency effectiveness and efficiency can thus be evaluated in terms of its impact on economic development.

Gross product, per capita income and any of the cumulative measures of inequality representing distributions of value, are all measurable variables. Using these measures, not only can we actually describe an economy's performance in quantifiable terms, but we can also be able to set up measureable goals for increasing gross product, per capita income or decreasing the Gini index or any other cumulative measure of inequality or increasing the Income Equity Index.[15]

Specific absolute figures can be set up as targets for a specific period, or we may choose to specify the growth rate in terms of percentage increases on a changing base for the same period, or for every year. The decision on these figures hence will be dictated by the conditions prevailing and the expectancies regarding the economic infra-structure, industrial and labor capacities, net figures on migration and natural growth. See Table 4.1 for a listing of the Gini Index and their corresponding Income Equity Indices for the 50 states and for the United States as a whole. Note that Oklahoma ranks ninth, with a Gini coefficient of .465 and an Income Equity Index of .535, which ties with North

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[15]The construction of the Income Equity Index is discussed in the previous chapter, pp. 93 - 97, by subtracting a Gini Index value from 1.00, or multiplying the area under the Lorentz curve by two. The use of this index follows the traditional practice of defining goals in terms of increasing some positive values rather than in terms of decreasing some values that have negative connotations.

TABLE 4.1

GINI AND INCOME EQUITY INDICES
IN THE AMERICAN STATES

State	Gini Index[a]	Income Equity Index	State	Gini Index[a]	Income Equity Index
1. Mississippi	.510	.490	26. Minnesota	.431	.569
2. Arkansas	.486	.514	27. North Dakota	.430	.570
3. Alabama	.478	.522	28. New York	.429	.571
4. Tennessee	.478	.522	29. California	.427	.573
5. Louisiana	.477	.523	30. Colorado	.425	.575
6. South Carolina	.474	.526	31. Maryland	.424	.576
7. Kentucky	.474	.526	32. Illinois	.423	.577
8. Georgia	.469	.531	33. Rhode Island	.418	.582
9. Oklahoma	.465	.535	34. Montana	.415	.585
10. North Carolina	.465	.535	35. Indiana	.414	.586
11. Texas	.464	.536	36. Nevada	.414	.586
12. Florida	.462	.538	37. Massachusetts	.414	.586
13. Virginia	.461	.539	38. Washington	.413	.587
14. Missouri	.459	.541	39. Pennsylvania	.412	.588
15. South Dakota	.456	.544	40. Wisconsin	.412	.588
16. Alaska	.456	.544	41. Maine	.412	.588
17. West Virginia	.451	.549	42. Oregon	.411	.589
18. Hawaii	.446	.554	43. Michigan	.409	.591
19. Arizona	.445	.555	44. Ohio	.408	.592
20. New Mexico	.440	.560	45. New Hampshire	.407	.593
21. Nebraska	.440	.560	46. Connecticut	.404	.596
22. Kansas	.439	.561	47. New Jersey	.403	.597
23. Iowa	.439	.561	48. Idaho	.402	.598
24. Delaware	.434	.566	49. Wyoming	.399	.601
25. Vermont	.434	.566	50. Utah	.394	.606

U. S. as a whole: Gini Index = .439
Income Equity Index = .561

[a]Thomas D. Hopkins, "Income Distribution in Grants-in-Aid Equity Analysis," National Tax Journal, Vol. 18 (June, 1965), pp. 209-213.

Carolina. Twenty-one states have Income Equity indices lower than that of the U.S. as a whole, indicating greater income inequality in these states than in the Nation as a whole. It is also an interesting aside that most of these states are the traditional southern and "border" states.[16]

The use of the Gini index to set up target values for jobs, incomes, etc., is made particularly attractive by Hofferbert's discovery of some interesting relationships between income distributions and other environmental variables in the states.[17] For instance, the greater income inequality represented by a high Gini index appears to be associated with lower levels of income, ruralism, agriculturism, and lower levels of adult education. Table 4.2 shows simple correlation coefficients of selected factor scores representing environmental variables with the Gini Index.[18] Hofferbert used factor analysis and came up with two independent environmental dimensions: "Industrialization" and "Cultural Enrichment."[19] However, his base variables are

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[16]The first 14 in fact are all of the Southern and most of the "border" states. West Virginia is rank no. 17 and Kansas, rank no. 22, but has an Income Equity Index equal to that of the United States as a whole, and none of them above.

[17]Richard I. Hofferbert, "Composition and Political Relevance of Major Socio-Economic Dimensions of the American States 1890-1960," Midwest Journal of Political Science, Vol. 12 (August, 1968), pp. 401-418.

[18]Obviously, since the Income Equity Index is only the complement of the Gini Index, the correlations will be the same except for a reversal of signs.

[19]This certainly justifies the fears of certain sectors in Oklahoma, that the Bartlett administration's emphasis on industrialization might be at the cost of cultural enrichment.

TABLE 4.2

CORRELATIONS BETWEEN INCOME INEQUALITY AND CERTAIN ECONOMIC DEVELOPMENT VARIABLES IN THE AMERICAN STATES

Variable	Coefficient	Variable	Coefficient
Per Capita Personal Income	-.64	Median School Year Completed	-.69
Median Family Income	-.77	Nonwhite Population	.72
Urbanization	-.50	Industrialization Factor Score	-.35
Industrialization	-.36	Cultural Enrichment Factor Score	-.67

Source: Hofferbert, op. cit., p. 407.

only summary measures like arithmetic means or medians for whole states rather than distributional measures.

Hofferbert's study shows a negative association between income inequality and both industrialization and cultural enrichment factors. A deduction of some pragmatic value is that increasing industrialization or cultural enrichment is associated with reductions in income inequality.

Dye's study on income inequality and state politics[20] would even be of strategic and tactical importance to the Bartlett administration, currently facing an election year. His initial results of correlation and regression analysis using the Gini Index as an independent variable reveal that income inequality is associated with:

(1) A reduction in party competition for state office,

(2) A reduction in voter participation,

(3) An increase in Democratic voting for state offices,

(4) An increase in interest group strength,

(5) More fragmentation in state executive organization, and

(6) A reduction in the governor's formal powers.

What is even noteworthy is Dye's claim that the variable income distribution is more closely related to these political system variables than the absolute measures of social

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[20]Thomas R. Dye, "Income Inequality and American State Politics," American Political Science Review, Vol. 63 (1969), pp. 157-162; also reported in "The Development of Comparative Analysis in State Politics," a paper presented to the Southern Political Science Association Meeting, November, 1968, at Gatlinburg, Tennessee.

and economic resources in the states, or even factors derived from those absolute measures.[21]

It will thus be an on-going function of the planning unit to keep track of economic data, as well as demographic and social data that will have impact on the economy and hence should be considered in planning for the area (Nation, region, state, county or city). It will also be the task of the planning unit to set up the various target objectives after proper analysis of conditions and reliable projections are made. This section only sets up the general design and philosophy for evaluating final particular efforts in the direction of achieving any public agency's planning goal(s).

Altschuler believes that planners should develop what he calls "middle range" goals, goals which are operational in spite their general nature. He feels the such goals allow for a more democratic process in permitting "meaningful political discussion and approval of planning goals."[22] However, the drawback such goals have is that they provide "no basis for the planner to understand the overall public interest,"[23] since the ultimate choice of the specialized objective as well as the priority of its implementation would be the decision of politicians. Altschuler is thus forced to conclude that politicians will have to be convinced

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[21]Dye, Gatlinburg paper, pp. 12-15.

[22]Altschuler, op. cit., p. 324.

[23]Ibid.

that the comprehensive plan will contribute to the welfare of the politicians' constituents. He appears to be convinced that politicians never act on anything they do not understand, yet he feels that only the planner can properly evaluate comprehensive plans and the interrelated goals that are part of them.

Whatever specific goals may be set up relating to housing, public health and welfare and so on, they can only be met if a sufficient economic base can be set up to support them, as well as support the population that should be able to afford the new goods and services a public agency wishes to plan for them. Mere increases in gross product and per capita income, however we may define them, do not necessarily entail a distributed increase, since they can be "inflated" by merely increasing considerably the output and income of the population's top 10% or even of less. The addition of the Gini index, or its derivative, the Income Equity Index, as a criterion for economic development, forces the issue of distribution. Merely increasing the two gross measures at the same rate throughout the entire structure would not be sufficient, because it only represents maintaining the status quo. To decrease the Gini index or increase its complementary Income Equity Index, a considerable improvement of the lower-income population will have to be effected, to give any meaningful decrease in the Gini index or a corresponding increase in the Income Equity Index. This, in effect, requires the drastic bringing up of lower income levels to more equitable amounts.

These increases in income, however, would not be too meaningful, unless they are also accompanied by increases in output, if we are to avoid the risks of inflation.[24] Taxation, then, will be expected to have a less instrumental role in achieving the goal of a more equitable income distribution, since it makes no sense to antagonize the few whose tax contributions are the biggest, if this will lead to their flight from the area. What is more important immediately is to improve the tax base, then effect changes in the tax structure, improving the enforcement function, closing loopholes, etc. Moreover, income taxation is more nearly the prerogative of the national government. The city or the state can only be concerned legitimately with other forms of taxes that bring in comparatively less revenue than income taxes.

Also, increasing taxes of any sort will be a meaningless gesture unless the tax base is improved. Otherwise, an unwanted consequence may be preventing in-migration of those who might ultimately contribute. It is, however, doubtful that in-migration of those who cannot contribute will be affected by this. It is even much more likely that

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[24]For an excellent discussion on economic development from a "principles" point of view, see Benjamin Higgins, Economic Development: Principles, Problems and Policies (New York: W.W. Norton & Company, Inc., 1959), although his cases are drawn from international sources. For a "human element" point of view, see Bruce R. Morris, in cooperation with C. Wendell King, Economic Growth and Development (New York: Pitman Publishing Corporation, 1967). Cf. C.E. Ayres, The Theory of Economic Progress: A Study of the Fundamentals of Economic Development and Cultural Change (2nd ed.; New York: Schocken Books, 1962).

those who migrate might feel forced not to contribute, if they begin to believe that such a contribution is onerous. And if they are even productive at all, they may choose to produce less, in order to be taxed less.

The "penalty" aspect of taxation is much too apparent, so that a greater incentive must be shown for the people to want to earn and produce. They will be better willing to pay their fair share of the tax burden if they can see what they are paying for, and if they feel they can afford it, or better yet, if they feel that paying their taxes keeps the system that gets them paid and producing to improve, so that they can produce more and get paid even better.

The statements made above very clearly indicate that a number of assumptions were made regarding the psychology of the migrants to and the inhabitants of any given area, their composition, the productive capacity of the area and the role played by the government in all of these. For example, the values and the total cultural configuration of the minority groups will have to be taken into consideration, so that planning will include them and will therefore not be an empty academic exercise. It will be noted that while they might be willing to work, they are inclined to ask "What for?" and are apt to feel discouraged by any sense of injustice. Since they are not as imbued as are the usual middle-class oriented Americans with the

"work ethic", they will not work for work's sake; but if they can see what they are working for, in terms of what they can personally get out of it, for their family and for any of their meaningful groups, they will be more enthusiastic about it.

Escalating Expectations and Economic Development

In an unpublished paper entitled "Escalating Expectations" delivered to a Department of State Symposium on Great World Problems of the Next Decade,[25] Dr. Oliver Benson proposed an escalation index as a rough measure of expected pressure for improvement in welfare standards in the next decade. In view of Altschuler's view of the primary objective of planning as a task of educating people to expect government to deal with more of their needs and problems,"[26] this measure promises tremendous pragmatic value. While his data were taken only from a sample of 11 underdeveloped nations of the world, there is no methodological reason for not adapting the same techniques to analyzing underdeveloped areas or regions in a state or nation. His Value Distribution Matrix,[27] Awareness Indicators,[28] Relative Value Distribution and Relative Values on Awareness Indices,[29] all depend on data that are

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[25]April 25-27, 1966.

[26]See footnote 4, p. 100, supra.

[27]Benson, "Escalating Expectations" paper, pp. 13-15.

[28]Ibid., pp. 16-17.

[29]Ibid., pp. 18-20.

available, and perhaps even more reliable, on a domestic -- national, regional, state, or local -- basis.

Only his Military Index,[30] and Pressure and Power Scales[31] derived from a relative military scale cannot be applicable. Some similar index of power or pressure may perhaps be constructed from riot data, demonstration figures, frequencies, etc. However, these type of data, not being institutionalized as figures on the military, are not likely to be very reliable, since they involve obviously clandestine and illegal activity. Estimates can have a significantly wide range of variance, particularly since definitions are likely to vary, depending on an observer's role, commitments and biases. While actual numbers of the national guard, highway patrol or local police, sheriff and deputies are available, this variable is more likely to represent some administrator's subjective judgment, biases or fears, rather than the reality of pressure Benson's military index or pressure and power scales signify.

Benson's Value Distribution Matrix makes use of the following sets of data:

(1) G.N.P. per capita
(2) Caloric intake (calories per capita per day)
(3) Doctors per 100,000 persons.
(4) Energy consumption (megawatts per capita)
(5) Steel consumption (metric tons per capita)
and (6) Social services (number of agencies).

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[30] Ibid., pp. 21-22.

[31] Ibid., pp. 23-24.

These data however, can be estimated, and even refined for planning purposes. Item (6), for instance, can even be refined to measure the scope of services in terms of numbers of clients, dollar-values of service, or number of clients per hundred or thousand dollar values spent, or some similar benefit-cost ratio. Item (5) is obviously a rough measure of industrialization, and can further be refined to take advantage of real actual data available or that can be obtained.

Similarly, items (2), (3), and (4) can be refined to utilize existing data or that which are readily obtainable. However, instead of G.N.P. per capita in item (1), the Gini Index or its derivative Income Equity Index might be offered as a more meaningful component. Or, better yet, the two combined with some measure of real disposable income (as G.N.P. is strictly an estimate of production rather than income) might serve as a more meaningful component of a refined Value Distribution Matrix. Naturally, the decision as to what to include in such rough measures ultimately depend on the data available or obtainable, the uses for which measures are devised and what the planner or administrators believe to be relevant components. To simulate any rough measures at this point would be unnecessary. The basic idea is that there can be developed a rough measure that would indicate how well or how badly a given community, area, region or state satisfies general aspirations for income, nutrition, health and medical care, energy,

industrialization and social services as education, social insurance and social assistance, transportation and communication, etc.

Benson's Awareness Indicators include the following sets of data:

(1) Newspaper circulation per 1,000
(2) International mail flow (pieces per 1,000)
(3) Radios per 1,000
(4) School population per 1,000
(5) Literacy rates
and (6) Trade (Exports and Imports in U.S. dollars per capita).

Again, all these data can be available, and even more reliable, for counties, regions or states, for planning purposes. Item (2) might however be revised to consider all mail flow, and another item -- television sets per 1,000 -- may be added.

His Relative Value Distribution and Relative Value on Awareness Indices merely represent normed values arrived at by converting figures in the first two matrices, usually as percentages of the world mean for each of the items. For planning purposes however, the norm or standard would very well depend on the level of operations of the public agency or its position in the bureaucratic hierarchy. It is conceivable for the norming of values to be done on the national average, a regional average, or a state average--whichever may be required by law or usual procedure by the planning agency. A mean value[32] then, for an area--a

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[32]For all the relative values on distribution and awareness.

community, a county, a state, or even a development region -- can be derived as a single index for that area on each of the value distribution and awareness scales. By dividing the resulting awareness index by its achievement index, a Value Satisfaction Quotient[33] is derived. A high V.S.Q. "reflects presumed dissatisfaction, since it is a measure of the distance between aspirations and achievement."[34] As such, its pragmatic value as a decisional factor in planning for development can be expected in the quantitative character it offers to support any subjective judgment on the imperatives of needs felt in an area.

Its utility in deciding rationally on plans or projects for which efficiency indices have been or can be estimated, would be similar to that of the standardized final weights derived by the different alternative "assigned weights" methodologies discussed in the previous chapter.[35] The different value satisfaction quotients can take the place of the goal weights or values used in the cross-products technique also discussed in chapter III.[36] For the State of Oklahoma, the Division of Research and Planning of the Industrial Development and Park Department is currently compiling a community development information bank. Color-coded questionnaires and code sheets compiled by town by

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[33]Benson, op. cit., p. 23.

[34]Ibid.

[35]Chapter III, pp. 58-61, 69-70, 71-72, supra.

[36]Ibid, pp. 75-81.

county will have detailed data on labor, transportation, communications, utilities, established industries, local financing, county and community government, social and cultural environment, physical environment, available buildings, and sites currently designated. The wealth of information that can be extracted from these compilations not only can be put to better use by Benson's V.S.Q., but can even lead to further refinements in the adaptation of the technique to the problems of a local planning agency's identifying areas for project development, or for evaluating current projects in these areas.

A Cost-Estimate Efficiency Index for Plans or Projects[37]

For each alternative plan or project we begin with a degree one homogeneous production function[38] in two variables, the total costs of construction and equipment, and cost measures of man-years required for operations and maintenance, written as:

$$V = k\left[dC^{-r} + (1-d)\, M^{-r} \right]^{-1/r} \qquad (4.1)$$

where: V = amount of expected value to be added when the plan becomes operational

C = combined costs of construction and equipment in thousands of dollars

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[37]Adapted from Mark R. Daniels, "Differences in Efficiency Among Industries in Developing Countries," The American Economic Review, Vol. 59 (March, 1969), pp. 159-171.

[38]This equation is basically the Cobb-Douglas function developed by Paul H. Douglas and C. W. Cobb in "A Theory of Production," American Economic Review, Vol. 18 (1928) supplement.

and M = measures of man-years required for operations and and maintenance.

Parameters d and r are constants while k is the variable representing our estimates of efficiency for each alternative plan or project in achieving each goal or policy. The value of r is obtained from a side relation where

$$r = (1/s) - 1. \tag{4.2}$$

Estimates of s, the elasticity of substitution, are obtained for the ith alternative plan or project from a log linear regression of the average product of the cost of operations and maintenance on the wage rate given by the following equation:

$$\log\left(\frac{V}{M}\right)_{ij} = a_1 + s \log w_{ij} + e_{ij} \tag{4.3}$$

where $j = 1 \cdot \cdot \cdot n$, n being the number of goals or policies and w = wage bill for achieving goal or policy assuming that this will vary due to demands of fulfilling differential requirements each goal represents.

Differentiating (4.1) with respect to M and C and equating the partial derivatives to the ratio of factor costs:

$$d = \left[\left(\frac{C}{M}\right)^r \cdot \left(\frac{V - wM}{wM}\right)\right] \cdot \left[1 + \left(\frac{C}{M}\right)^r \cdot \left(\frac{V - wM}{wM}\right)\right]^{-1} \tag{4.4}$$

For each alternative plan or project, we can derive estimates for s from step (4.3). The values of r can then be derived by substituting the values of s in step (4.2). With estimates of costs of construction and equipment, and measures of man-years required for operations and maintenance,

and value added in the production process, and the total wage bill for each goal or policy, the value of $\underline{d}$ can be derived by substituting these estimates in equation (4.1). Finally, the value of $\underline{k}$, for each alternative plan or project by goal or policy, can be derived by substituting the values for $\underline{d}$ and $\underline{r}$ along with the corresponding estimates of costs of construction and equipment, measures of man-years required for operations and maintenance and the values added in the production process, in equation (4.1).

As Goss[39] suggests, "it is obvious that costs are important elements[40] and can be estimated with relative ease by engineers and specialists familiar with the type of proposed project,"[41] but his classification of costs of a proposed project includes:

(1) Its allocated design, programming, developmental costs;[42]

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[39]Bernard Goss, Economist to the Ozarks Regional Commission developed a method for evaluating projects or plans, discussed in a report dated November 19, 1969.

[40]Of his basic evaluation or scoring equation:

$$\text{Rate of Return Score, or Yield} = \left\{\left(\frac{\Sigma B^*}{\Sigma C}\right) + \left[\left(\frac{\Sigma B^*}{\Sigma C}\right) + \left(\frac{\Sigma B_{1\ldots n}}{\Sigma C_{1\ldots n}}\right) + \left(\frac{\Sigma B_{1\ldots n}}{1}\right)\right] (G)(M)\right\} (d)(p)$$

$$\begin{array}{cccc} & & \text{Operation} & \\ & & \underline{\text{Maintenance}} & \\ \underline{\text{Design Programming}} & \underline{\text{Construction Equipment}} & \underline{\text{Internal}} & \underline{\text{Project Output}} \end{array}$$

*$\sum B$ estimated as being five times $\sum C$.

[41]From a section entitled "English Translation: The Evaluation Scoring Equation." Some pages of the report were unnumbered, others numbered only by sections that were stapled together.

[42]Usually estimated as ten per cent of the costs of construction and equipment.

(2) Its construction and equipment costs;

and (3) The costs of operations and maintenance over its operating life.[43]

Goss does realize that "these on-site estimated benefits and costs have an economic development impact which varies with their total estimated size relative to the impacted county(s) total annual income gap."[44] However, instead of allowing variability of the benefit-cost ratio by a variable, he uses a constant 5. He uses a "growth factor", G, and a "multiplier", M, to account for the variability of impact.

However, his factors cannot really perform the same function as a variable k, since benefits can be less than costs, rather than merely vary in multiples of 5. Furthermore G and M appear somewhat arbitrary. The values of G can actually vary by smaller percent intervals than the ones he set. These values may also be better scaled using transformation techniques, even granting the first and last factor values.[45]

Actually however, the costs of allocated design, programming and development can be included in construction and equipment costs, since these are all prior steps to

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[43]Again calculated as a certain percentage of costs of construction and equipment, varying according to nature of plan or project and its expected life-span.

[44]Loc. cit.

[45]At this point Benson's V.S.Q. discussed in the preceding section would be of unestimable value.

actual operation and maintenance. In the original Cobb-Douglas function,[46] the production function for the United States as a whole was estimated as:

$$P = 1.10\ L^{.75}\ C^{.25}$$

where: P = index of total production per year

L = index of labor inputs

and C = index of capital inputs.

The estimated exponents in this and the equation (4.1) are elasticities of production with respect to the factor inputs in each case. The first indicates the percentage change in production or expected amount of value added for a given percentage change in the first input. In the original Cobb-Douglas function, for a one per cent increase in the labor input, where capital is held constant, "the equation predicts that total production will increase by $\frac{3}{4}$ of one per cent."[47] The second exponent indicates the percentage change in production or expected amount of value added for a given percentage change in the second input. In the U. S. production function, with "a one per cent increase in capital input (labor held constant), total production will increase by $\frac{1}{4}$ of one per cent."[48]

In equation (4.1) the negative signs to the exponents or its reciprocal can be explained by calling attention to

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[46]Douglas, op. cit.

[47]Michael J. Brennan, Preface to Econometrics: An Introduction to Quantitative Methods in Economics (2nd ed.: Cincinnati; Southwestern Publishing Company, 1965), p. 411.

[48]Ibid., pp. 411-412.

equation (4.2). Every time s is greater than 1, the value of r becomes negative, so that the double negative when plugged into equation (4.1) becomes a positive power or exponent. Fractional powers or exponents can be handled by defining the expressions in which they occur as the reciprocal of the nth root of the expression, provided the value of the power is a real number. Otherwise, logarithmic techniques will have to be used in the solution of equations.

For instance suppose s turns out to be-0.697 for a particular plan or project for achieving a given policy or objective:

$$r = (1/-0.697)-1 \qquad (4.21)$$

$$r = (-1.4 - 1) = -2.4 \qquad (4.22)$$

Substituting this value in an equation where

$V = 100$

$C = 20$

and $M = 50$

as determined by the panel of experts and specialists, equation (4.1) becomes:

$$100 = k\left[d(20)^{2.4} + (1-d)\ (50)^{2.4}\right]^{1/2.4} \qquad (4.11)$$

In this case since the exponent is a fraction, whose denominator is not a real number, logarithmic techniques will be necessary to solve this equation.

Solving for k, equation (4.11) can be rewritten as:

$$k = \frac{100}{\left[d(20)^{2.4} + (1-d)(50)^{2.4}\right]^{1/2.4}}$$

Suppose $d = .5$

Let: $A = \left[.5(20)^{2.4} + .5\ (50)^{2.4}\right]$

$B = .5(20)^{2.4}$

and $C = .5(50)^{2.4}$

$\log B = \log .5 + 2.4 \log 20$

$= 9.69897\text{-}10 + 2.4(1.30103)$

$\log B = 2.82144$

$B = .6625 \times 10^2 = 66.25$

$\log C = \log .5 + 2.4 \log 50$

$= 9.69897\text{-}10 + 2.4\ (1.69897)$

$\log C = 3.7757$

$C = .597 \times 10^3 = 597$

Since $A = B + C = 66.25 + 597.00$

$A = 663.25$

$\log A = \log 663.25$

$\log k = \log 100 - 1/2.4 \log 663.25$

$k = \text{antilog } 0.8244$

$k = .667$

The concept of efficiency employed in this method is a form of residual where efficiency is defined and measured in terms of variation in production unexplained by weighted differences in the construction to maintenance costs ratio. The assumption of this method is that the value added per unit cost of construction and equipment required by a given plan or project varies across goals or policies with the wage bill.

Both the amount of value expected to be added (V) when the plan or project becomes operational and the costs

of construction and equipment (C), have to be stated in terms of thousands of dollars. The measures of man-years required for operations and maintenance (M), when the plan or project is operational, represents a relatively constant labor-input even if costs of operations and maintenance can be expected to vary due to the size of the wage bill (w). Now, the meaning of equation (4.4) becomes clearer: The value of d, which appears as the coefficient of C and M in equation (1), does involve the wage bill. However, because of the simplifying assumptions made, to derive a measure of efficiency from as few available measures or estimates, equation (4.1) in its present form is preferred to the more general form:

$$V = (bC^{-r} + aM^{-r})^{-1/r}$$

where $b = dk^{-r}$

and $a = (1-d)k^{-r}$.

If a is constant, or nearly so, variations in efficiency ratings would be concentrated in costs of construction and equipment and, conversely, in inputs of operations and maintenance for a constant b. If b and a vary proportionately then d is a constant, since b/a is a constant. It is possible to calculate coefficients of variation to see which of a, b or d is the more clearly constant, but we can accept Daniels' findings that d is the best choice of the three alternatives.[49]

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[49]Daniels, op. cit., p. 164. Also, see K.J. Arrow, H. B. Chenery, B. S. Minhas and R.M. Solow, "Capital-Labor Substitution and Economic Efficiency," The Review of Economics and Statistics, Vol. 43, No. 3, (August, 1961), pp. 225-250.

Equation (4.3) which allows the value of $\underline{s}$ to be estimated for each alternative plan or project represents a log linear regression of the average product of the costs of operations and maintenance on the wage rate, noting how the wage bill can vary even for the same alternative in pursuing different policies or goals. For instance, to pursue the goal of motivating the new productive and educated segments of Oklahoma society to remain and contribute to the state may require a different set of specialists than pursuing the industrial growth in the state by attracting new industries or helping develop those already located in the state. This difference will be reflected in the monetary requirements to support the staff or personnel, even if the same man-year values are allocated to it.

Equation (4.4) provides us with a method for calculating the constant coefficients of our variable factor costs. While certainly the real efficiency rating of the alternative plans or projects is determined by a whole lot of other factors, for predictive purposes, the two main components of costs of construction and equipment and costs of operation and mainenance would be sufficient.

The value of the $\underline{k}$, the efficiency rating variable will thus vary from 0.00 to 1.00, which approximates our definition of efficiency in probability terms. Once more, having derived these values, we can plug them into our plans-goals or plans-policies matrix[50] and proceed with summing their

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[50]See pp. 75-81 <u>supra</u>.

cross-products with the weights determined for each goal or policy. The operations are thus simplified enough for policy-level decision-makers to see, once the efficiency ratings are established and furnished them.

CHAPTER V

MAXIMIZING COVERAGE OR EFFECT AS AN OPERATIONAL PROGRAM OR PROJECT GOAL

Maximizing Benefits

Investments made in public agency programs or projects have to be evaluated in terms of the goals of the agency. Thus, the explicit identification of goals becomes paramount in the analysis. Otherwise, there is no way to define success objectively as "a complete or at least a substantial, realization of a program's goals."[1] This widely-used mode of evaluation of organizations and their effectiveness was earlier called by Etzioni as the goal-model approach.[2]

Sherwood suggests three kinds of variables in the determination of the success or failure of programs: program variables, intermediate variables, and dependent

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[1]Perry Levinson, "Goal-Model and System-Model Criteria of Effectiveness," in Fremont J. Lyden et al., eds. Policies, Decisions and Organization (New York: Appleton-Century-Crofts, 1969), p. 277.

[2]Amitai Etzioni, Modern Organizations (Englewood Cliffs, N. J.: Prentice-Hall, Inc., 1964), Chapter 2.

variables.[3] He defines program variables as "that complex set of organized stimuli" which act on the input (incoming group) to produce an output (desired change). Intermediate variables on the other hand are certain "attitudinal and cognitive changes" that have previously occurred that affect the outcome. The dependent variables would be the output or outcome of the program or project as system.[4] The intermediate variables may also be considered as intervening variables that have an "assumed causal relationship" with the dependent variables.[5]

Levitan describes the Economic Opportunity Act of 1964 as having been "sold to the nation as a measure to rehabilitate the poor, placing them on the road to economic independence."[6] Job creation and training was stressed by the various programs inaugurated under the Act: The Job Corps, Neighborhood Youth Corps and Work and Training as explicitly provided for in the 1964 original Act.

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[3]Levinson, loc. cit. Also, see Clarence C. Sherwood, "Methodological, Measurement and Social Action Considerations Related to the Assessment of Large-Scale Demonstration Programs," paper presented to the 124th Annual Meeting of the American Statistical Association, Chicago, December, 1964; and Clarence C. Sherwood and Howard E. Freeman, "Research in Large-Scale Intervention Programs," Journal of Social Issues, Vol. 21 , No. 1, (January, 1965), pp. 11-27.

[4]Ibid., pp. 277-283.

[5]Ibid., p. 282.

[6]Sar A. Levitan, Antipoverty Work and Training Efforts: Goals and Reality, Policy Papers in Human Resources and Industrial Relations No. 3 (Michigan and Washington, D.C.: The Institute of Labor and Industrial Relations with the National Manpower Policy Task Force, 1967), p. 1.

Levitan blames "the Welfare Administration's long tradition of permissive administration" as a "formidable obstacle to evaluating program effectiveness."[7] Normally, funds for Welfare Administration programs are allocated to states on the basis of a formula requiring them to match the federal funds. However, federal administrators have had usually little control over the administration of projects supported by these funds.[8]

There is apprehension that objective studies may indicate that program goals are not achieved. Thus, some administrators opt for "anecdotal" evaluations with sketchy and carefully screened data to project a favorable image for their agency or administration and avoid risking more rigorous objective analysis, which may be unfavorable.[9] As Levitan concludes in his first chapter aptly titled "An Evaluator's Lament":

> . . . The Office of Economic Opportunity embarked upon the development of sophisticated operational data to evaluate the program only

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[7] Ibid., p. 3.

[8] Ibid., Cf. James L. Sundquist with the collaboration of David W. Davis, Making Federalism Work (Washington, D.C.: The Brookings Institution, 1969), particularly chapter one, pp. 1-31 et passim. Also: Goals for Americans: The Report of the President's Commission on National Goals (New York: Prentice-Hall, Inc., 1960), passim.

[9] There are sufficient grounds to suspect that part of the lack of cooperation and diminution of support for this research from the Division of Research and Planning after Dr. Pat Choate's termination as director, indicates this very thing. The threats, whether real or only imagined, when translated into fear, are then reacted to in terms of political interference which definitely hampered this research from applying methodologies developed to relevant and meaningful data.

> after continued Congressional and public questioning of the effectiveness of the Job Corps and criticism of the highly subjective data in its defense. Literally, it took an act of Congress for the Job Corps to develop the data which have turned out to be quite favorable to the program.[10]

As Levinson suggests, in his analysis of the Work Experience Program under Title V of the Economic Opportunity Act using the goal-model approach:

> . . . Effectiveness can be defined not only in terms of the number of trainees employed, but also in terms of the number of scientifically proved hypotheses. These would include hypotheses relating program content with changes in attitude.[11]

He feels that different programs have differential rates of successful outcomes and differential bases of scientific validity. Also, he suggests evaluation of what he calls "intervention programs" to include monetary costs, to provide essential information for a cost-benefit analysis.[12] Unfortunately, these costs are only the usual measures of central tendency: arithmetic means or medians. The addition of distributional measures such as the Gini Index or its derivative Efficiency Index would make the evaluations more meaningful. Maximizing benefits then need not only mean

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[10]Levitan, op. cit., p. 4.

[11]Levinson, op. cit., p. 286.

[12]See preceding chapter on this, pp. 99-132. The quantitative methodologies in that chapter as well as those in chapter III equally apply in this case. Cf. Abraham S. Levine, "Cost-Benefit Analysis and Social Welfare," Welfare in Review, Vol. 4, No. 1 (February, 1966), pp. 1-11.

increasing some per capita measure of the programs effectiveness, or increasing the benefit-cost ratio in total or even per capita terms. The Gini Index or its derivative Efficiency Index will give a measure of how such increases, if any, are distributed throughout the population.

For illustrative purposes, the school integration situation in the Oklahoma City Schools area is analyzed and simulated to minimize the dependency on an immediate impact on economic development that may likely confound the issues. Obviously economic development would be ultimately contributed to in developing part of what the economists call the infrastructure, which the educational system is one.[13]

The "separate but equal" doctrine announced by the court in the 1896 decision in Plessy vs. Ferguson[14] was seriously challenged although the decision concerning five famous cases from Kansas, South Carolina, Virginia and Delaware does not make automatically illegal all similar cases of discrimination.[15] By directing the lower courts to command school boards to integrate "with all deliberate speed" the courts have, in effect, turned themselves into "executive bureaus for the interim of the crisis--that period of time in which it looks as though the states may not integrate."[16]

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[13]Cf. Higgins, op. cit., pp. 239-261. Also: August Kerber and Wilfred Smith, eds., Educational Issues in a Changing Society (Detroit: Wayne State University Press, 1962), passim.

[14]163 US 537.

[15]Supreme Court Decision on Segregation in Public Schools. 347 US 483.

[16]Kerber, op. cit., p. 130.

As the Supreme Court declared in its historic ruling of May 17, 1954:

> Today, education is perhaps the most important function of state and local governments. Compulsory school attendance laws and the great expenditures for education both demonstrate our recognition of the importance of education to our democratic society. . . . In these days, it is doubtful that any child may reasonably be expected to succeed in life if he is denied the opportunity of an education. Such an opportunity, where the state has undertaken to provide it, is a right which must be made available to all on equal terms.
>
> We come then to the question presented: Does segregation of children in public schools solely on the basis of race, even though the physical facilities and other "tangible" factors may be equal, deprive the children of the minority group of equal educational opportunities? We believe that it does . . .[17]

The Civil Rights Act of 1964 was passed after months of debate and invoking the cloture rule to end a Southern filibuster in the Senate. It is significant to note that this was the same year that saw the passing of the Economic Opportunity Act. Among the many provisions of the Civil Rights Act of 1964 is one that authorizes the Attorney-General to take a more active role in initiating school desegregation suits that ordinarily may not have prospered due to lack of funds of aggrieved individuals or because they are threatened with either economic injury or physical harm. More importantly, the act stipulates that federal funds be withdrawn from any school district or public institution of higher education that refuses to desegregate.

The New York Times, following the passage of the Civil Rights Act of 1964 and the 1964 street riots in New

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[17]347 US 483.

York City conducted a survey indicating that most blacks regard civil rights as a minor problem compared to economic complaints: low-grade, low-paid jobs; unemployment; sub-standard housing, high rents and overcrowded conditions. However, most of the blacks polled reported wanting their children to be able to attend integrated schools, and to live in integrated neighborhoods.[18]

In Oklahoma City, conditions were no different. Although no riots occurred, sentiments of the black community were essentially the same. The blacks in the city constitute approximately 14% of the city's population and about 22% of the schools' population. They are concentrated in a southeast section of the city, bounded on the north by U.S. Highway 66, on the east by Interstate Highway 35 and the North Canadian River on the south.

The Oklahoma City Public School district, founded in 1891, now encompasses some 200 square miles in Oklahoma City and surrounding suburbs. (See map, Figure 5.1.) Enrollment is about 73,000 in 87 elementary and 26 secondary schools. The district employs 3,227 certified personnel 18.3% of whom are black.[19] Its budget is nearly $35 million

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[18] New York Times, July 27, 1964.

[19] Oklahoma City Public Schools Department of Research and Statistics Report, "Certified Personnel," April 22, 1970, p. 3.

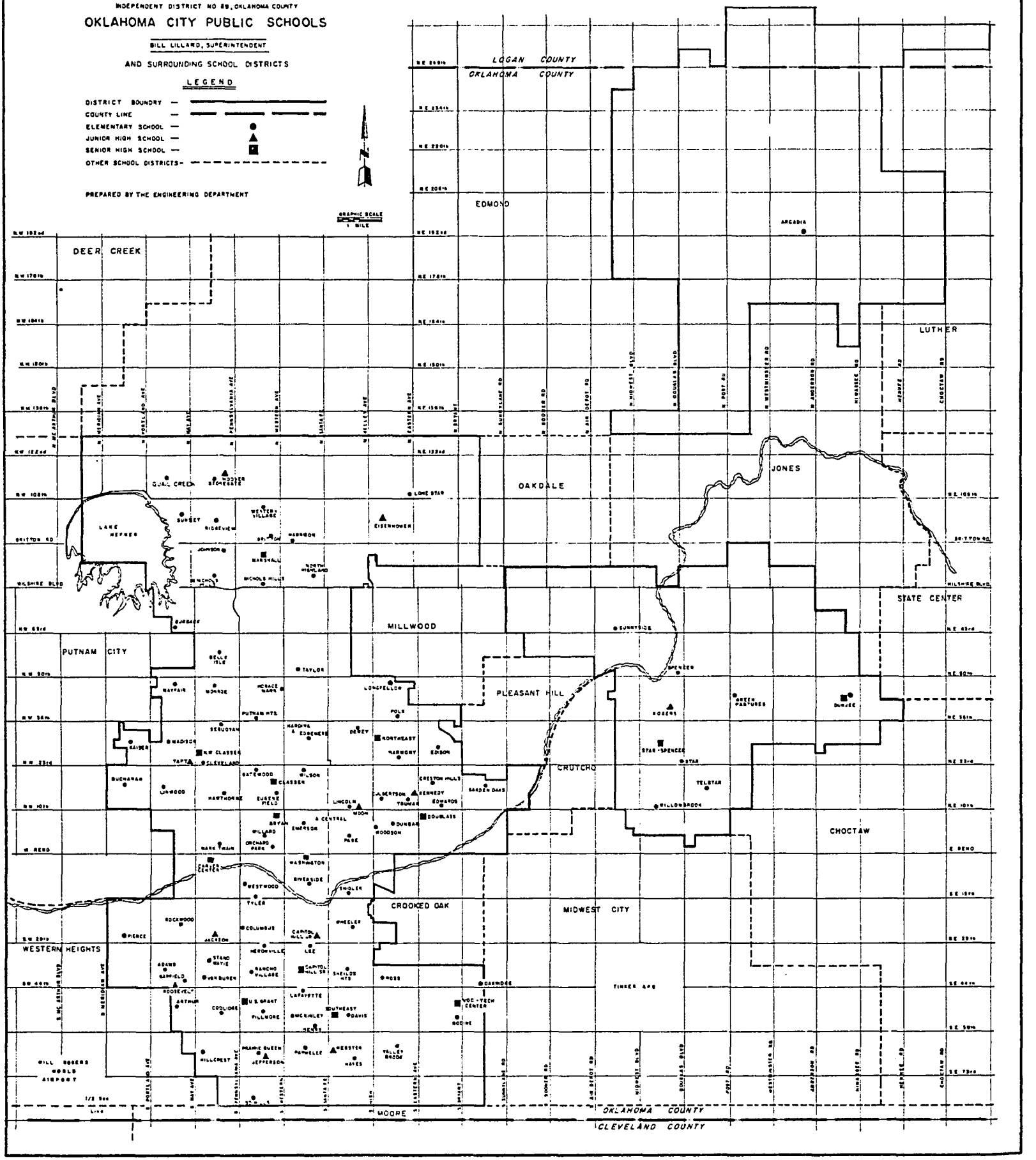

Figure 5.1. Oklahoma City Public School Districts.

annually with total assets of $113 million and a tax valuation of $421.5 million.[20]

Enrollment data for the school years 1968-1969[21] and 1969-1970[22] were analyzed in terms of the Gini Index and its derivative Efficiency Index. Only the proportion of black students to total students was scrutinized for this was all that was necessary to calculate the Gini Index and its derivative Efficiency Index. The enrollment data is actually a listing by school, by grade of the numbers of black, white and total pupils cumulated by primary and secondary levels. Also, a final column of % black students in each school was given.

To derive the Gini data however, all of the numbers of black students in each school had to be expressed as a percentage of all the total students on that level. Thus, we compared elementary school proportions for both years, and the high school proportions for both years. As could be expected, high school black-total proportions were higher in both years to the elementary school black-total proportions.

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[20]The background and historical data came from a series of interviews with Mr. Paul Evans, administrative assistant to Dr. Bill Lillard, superintendent of the Oklahoma City Public Schools, during April and May, 1970.

[21]Report by the Oklahoma City Public Schools Department of Research and Statistics, "Pupil Membership by Grade and Race," September 25, 1968, 4 pp.

[22]Report by the Oklahoma City Public Schools Department of Research and Statistics, "Pupil Membership by Grade and Race," December 5, 1969, 4 pp.

The total number of students in each school was similarly expressed as a percentage of all the total students on that level. Then, the schools were arranged according to proportions of blacks to total students, from lowest to highest percentages. These percentages were then cumulated and plotted on regular arithmetic gird paper. The results are tabulated in Tables 5.1 to 5.4 and Figures 5.2 and 5.3.

Table 5.1 gives a Gini Index of .7520 for 1968, compared to a Gini Index of .6746 for 1969 in Table 5.2 for the high schools in Oklahoma City. This suggests some diminishing of inequality in one year that represents an attempt to desegregate the school system. Each year then simulates the efficiency of two different "plans".[23] 1969-H appears more efficient at desegregation than 1968-H, with an Efficiency Index of .33 compared with an Efficiency Index of .25 for 1968-H.

Comparing both years, 1968-H and 1968-E,[24] 1968-H has a slightly higher Efficiency Index with .25 to .24 of 1968-E. Their respective Gini Indices are .7520 and .7552

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[23]The years followed by "H" or "E" will designate our simulated desegregation plans, for which the data can be viewed as either actual results or projected estimates. "H" stands for the high school enrollment proportions while "E" stands for the elementary school enrollment proportions.

[24]See Table 5.3, pp. 145-146.

TABLE 5.1

COMPUTATION OF GINI INDEX AND EFFICIENCY INDEX FOR OKLAHOMA CITY HIGH SCHOOLS BLACK-TOTAL STUDENTS PROPORTIONS, 1968

No. of High Schools Involved[a]	Total Students in these Schools[a]	Cum.% of Total Students	No. of Blacks in these Schools[a]	Cum.% of Black Students	Computation of Area[b]					
					Triangles			Rectangles		
					h	w	A[c]	h	w	A[d]
10	11,776	37	24	0	--	--	--	--	--	--
3	7,423	61	55	1	.01	.24	.0012	--	--	--
2	1,119	64	124	3	.02	.03	.0003	.01	.03	.0003
1	968	68	110	5	.02	.04	.0004	.03	.04	.0012
1	1,063	71	150	7	.02	.03	.0003	.05	.03	.0015
1	1,058	74	244	11	.04	.03	.0006	.07	.03	.0021
1	1,844	80	375	17	.06	.06	.0018	.11	.06	.0066
1	1,116	84	467	25	.08	.04	.0016	.17	.04	.0068
1	889	86	501	33	.08	.02	.0008	.25	.03	.0075
1	602	88	600	42	.09	.02	.0009	.33	.02	.0066
1	689	91	685	53	.11	.03	.0016	.42	.03	.0126
1	1,423	85	1,418	75	.22	.04	.0044	.53	.04	.0212
1	1,545	100	1,541	100	.25	.05	.0062	.75	.05	.0375
25	31,515		6,294				.0201			.1039

[a]Oklahoma City Public Schools Department of Research and Statistics Report, "Pupil Membership by Grade and Race," September 25, 1968, p. 4.

[b]Under the Lorentz Curve

[c]Computed by the formula: $\frac{h \times w}{2}$

[d]Computed by the formula: $A = h \times w$

Total Area = .0201 + .1039 = .1240
Area of Inequality = .5 - .1240 = .3760
Gini Index = .3760/.5 = 2 x .3760 = .7520
Efficiency Index = 1.00 - .7520 = .248 ≈ .25

TABLE 5.2

COMPUTATION OF GINI INDEX AND EFFICIENCY INDEX FOR OKLAHOMA CITY HIGH SCHOOLS BLACK-TOTAL STUDENTS PROPORTIONS, 1969

No. of High Schools Involved[a]	Total Students in these Schools[a]	Cum.% of Total Students	No. of Blacks in these Schools[a]	Cum.% of Black Students	Computation of Area[b]					
					Triangles			Rectangles		
					h	w	A[c]	h	w	A[d]
8	10,285	33	34	0	--	--	--	--	--	--
2	4,373	47	62	1	.01	.14	.0007	--	--	--
2	1,050	50	76	3	.02	.03	.0003	.01	.03	.0003
1	916	53	77	4	.01	.03	.0001	.03	.03	.0009
1	1,076	56	160	6	.02	.03	.0003	.04	.03	.0012
1	383	58	169	9	.03	.02	.0003	.06	.02	.0012
1	1,074	61	233	12	.03	.03	.0004	.09	.03	.0027
1	1,190	65	248	16	.04	.04	.0008	.12	.04	.0048
1	951	68	286	20	.04	.03	.0006	.16	.03	.0048
1	2,627	76	301	24	.04	.08	.0016	.20	.08	.0160
1	1,028	79	304	29	.05	.03	.0007	.24	.03	.0072
1	1,302	84	361	34	.05	.05	.0012	.29	.05	.0145
1	1,032	87	429	40	.06	.03	.0009	.34	.03	.0638
1	668	89	667	50	.10	.02	.0010	.40	.02	.0080
1	690	91	686	60	.10	.02	.0010	.50	.02	.0100
1	1,321	96	1,319	80	.20	.05	.0050	.60	.05	.0300
1	1,365	100	1,359	100	.20	.04	.0040	.80	.04	.0320
26	31,331		6,771				.0189			.1438

[a]Oklahoma City Public Schools Department of Research and Statistics Report, "Pupil Membership by Grade and Race," December 5, 1969, p. 4.

[b]Under the Lorentz curve.

[c]Computed by the formula: $\frac{h \times w}{2}$

[d]Computed by the formula: h x w

Total Area = .0189 + .1438 = .1627
Area of Inequality = .5 - .1627 = .3373
Gini Index = .3373/.5 = 2 x .3373 = .6746
Efficiency Index = 1.00 - .6746 = .3254 $\approx$ .33

TABLE 5.3

COMPUTATION OF GINI INDEX AND EFFICIENCY INDEX FOR OKLAHOMA CITY ELEMENTARY SCHOOLS BLACKS - TOTAL STUDENTS PROPORTIONS, 1968

No. of High Schools Involved[a]	Total Students in these Schools[a]	Cum.% of Total Students	No. of Blacks in these Schools[a]	Cum.% of Black Students	Computation of Area[b]					
					Triangles			Rectangles		
					h	w	A[c]	h	w	A[d]
58	28,419	65	43	0	--	--	--	--	--	--
7	3,064	73	92	1	.01	.08	.0004	--	--	--
3	720	74	114	2	.01	.01	.0000	.01	.01	.0001
2	561	75	116	4	.02	.01	.0001	.02	.01	.0002
2	214	76	168	5	.01	.01	.0000	.04	.01	.0004
1	349	77	89	6	.01	.01	.0000	.05	.01	.0005
1	568	78	125	7	.01	.01	.0000	.06	.01	.0006
1	334	79	331	11	.04	.01	.0002	.07	.01	.0007
2	724	80	720	18	.07	.01	.0003	.11	.01	.0011
1	392	81	390	22	.04	.01	.0002	.18	.01	.0018
1	444	82	442	26	.04	.01	.0002	.22	.01	.0022
1	507	84	507	31	.05	.02	.0005	.26	.02	.0052
1	552	85	550	37	.06	.01	.0003	.31	.01	.0031
1	615	86	579	43	.06	.01	.0003	.37	.01	.0037
1	598	88	581	49	.06	.02	.0006	.43	.02	.0086

TABLE 5.3 (Continued)

COMPUTATION OF GINI INDEX AND EFFICIENCY INDEX FOR OKLAHOMA CITY ELEMENTARY SCHOOLS BLACKS - TOTAL STUDENTS PROPORTIONS, 1968

No. of High Schools Involved[a]	Total Students in these Schools[a]	Cum.% of Total Students	No. of Blacks in these Schools[a]	Cum. % of Black Students	Computation of Area[b]					
					Triangles			Rectangles		
					h	w	A[c]	h	w	A[d]
1	612	89	604	55	.06	.01	.0003	.49	.01	.0049
1	627	91	625	61	.06	.02	.0006	.55	.02	.0110
1	633	92	632	67	.06	.01	.0003	.61	.01	.0061
1	747	94	743	75	.08	.02	.0008	.67	.02	.0134
1	778	95	769	82	.07	.01	.0003	.75	.01	.0075
1	872	97	868	91	.09	.02	.0009	.82	.02	.0164
1	884	100	873	100	.09	.03	.0013	.91	.03	.0273
90	43,214		9,961				.0076			.1148

[a]Oklahoma City Public Schools Department of Research and Statistics Report, "Pupil Membership by Grade and Race," September 25, 1968, pp. 1-3.

[b]Under the Lorentz Curve

[c]Computed by the formula: $A = \frac{h \times w}{2}$

[d]Computed by the formula: $A = h \times w$

Total Area = .0076 + .1148 = .1224
Area of Inequality = .5 - .1224 = .3776
Gini Index = .3776/.5 = 2 x .3776 = .7552
Efficiency Index = 1.00 - .7552 = .2448 $\approx$ .24

denoting relatively high disproportionate ratios of blacks to total students in the Oklahoma City Public School System in 1968. In 1969, 1969-E[25] had hardly much of a gain over 1968-E, with a .25 Efficiency Index and a Gini Index of .7476, indicating only a slight decrease in inequality of black to total student ratios.

On the secondary level, the Efficiency Index of 1969-H of .33 shows quite an improvement over .25 of 1968-H, the corresponding Gini Index of .6746 for 1969 having dropped from .7520 in 1968. Looking at the Lorentz curves however in Figure 5.2, we note that in reality, most of the decrease in inequality, or the increase in efficiency of the 1969 "plan" over that of 1968 actually occurs in those schools that are already desegregated. The all-white, all-black or mostly-white or mostly-black schools have been affected only very slightly.[26]

The Lorentz curves in Figure 5.3., on the other hand, indicate very little change in the black-total student proportions. The fact that the 1969-line weaves around the 1968-line indicates that while there were decreases in inequality in some areas, there were also increases in inequality in other areas. The Lorentz curves are more useful graphic or visual aids to identify these general areas. The tables

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[25]See Table 5.4, pp. 148-149.

[26]Cf. Tables 5.1 and 5.2, pp. 143 and 144.

TABLE 5.4

COMPUTATION OF GINI INDEX AND EFFICIENCY INDEX FOR OKLAHOMA CITY ELEMENTARY SCHOOLS BLACKS - TOTAL STUDENTS PROPORTION, 1969

No. of High Schools Involved[a]	Total Students in these Schools[a]	Cum. % of Total Students	No. of Blacks in these Schools[a]	Cum. % of Black Students	Computation of Area[b]					
					Triangles			Rectangles		
					h	w	A[c]	h	w	A[d]
47	23,933	57	49	0	--	--	--	--	--	--
10	3,576	66	100	1	.01	.09	.0004	--	--	--
4	2,022	71	80	2	.01	.05	.0002	.01	.05	.0005
3	991	73	106	3	.01	.02	.0001	.02	.02	.0004
3	602	74	171	5	.02	.01	.0001	.03	.01	.0003
1	320	75	66	6	.01	.01	.0000	.05	.01	.0005
1	465	76	100	7	.01	.01	.0000	.06	.01	.0006
1	227	77	136	8	.01	.01	.0000	.07	.01	.0007
1	545	78	154	10	.02	.01	.0001	.08	.01	.0008
1	242	79	242	12	.02	.01	.0001	.10	.01	.0010
2	680	80	677	19	.07	.01	.0003	.12	.01	.0012
1	368	81	363	23	.04	.01	.0002	.19	.01	.0019
1	373	82	371	27	.04	.01	.0002	.23	.01	.0023
1	457	83	453	31	.04	.01	.0002	.27	.01	.0027
1	544	85	543	37	.06	.02	.0006	.31	.02	.0062
1	552	86	551	42	.05	.01	.0002	.37	.01	.0037
1	608	87	581	48	.06	.01	.0003	.42	.01	.0042

TABLE 5.4 (Continued)

COMPUTATION OF GINI INDEX AND EFFICIENCY INDEX FOR OKLAHOMA CITY ELEMENTARY SCHOOLS BLACKS - TOTAL STUDENTS PROPORTION, 1969

No. of High Schools Involved[a]	Total Students in these Schools[a]	Cum. % of Total Students	No. of Blacks in these Schools[a]	Cum. % of Black Students	Computation of Area[b]					
					Triangles			Rectangles		
					h	w	A[c]	h	w	A[d]
1	630	89	618	55	.07	.02	.0007	.48	.02	.0096
1	628	90	626	61	.06	.01	.0003	.55	.01	.0055
1	637	92	630	67	.06	.02	.0006	.61	.02	.0122
1	753	94	748	75	.08	.02	.0008	.67	.02	.0134
1	780	96	768	83	.08	.02	.0008	.75	.02	.0150
1	812	97	806	91	.08	.01	.0004	.83	.01	.0083
1	869	100	865	100	.09	.03	.0013	.91	.03	.0273
87	41,614		9,814				.0079			.1183

[a]Oklahoma City Public Schools Department of Research and Statistics Report, "Pupil Membership by Grade and Race," December 5, 1969, pp. 1-3.

[b]Under the Lorentz Curve.

[c]Computed by the formula: $A = \frac{h \times w}{2}$

[d]Computed by the formula: $A = h \times w$

Total Area = .0079 + .1183 = .1262
Area of Inequality = .5 - .1262 = .3738
Gini Index = .3738/.5 = 2 x .3738 = .7476
Efficiency Index = 1.00 - .7476 = .2524 $\approx$ .25

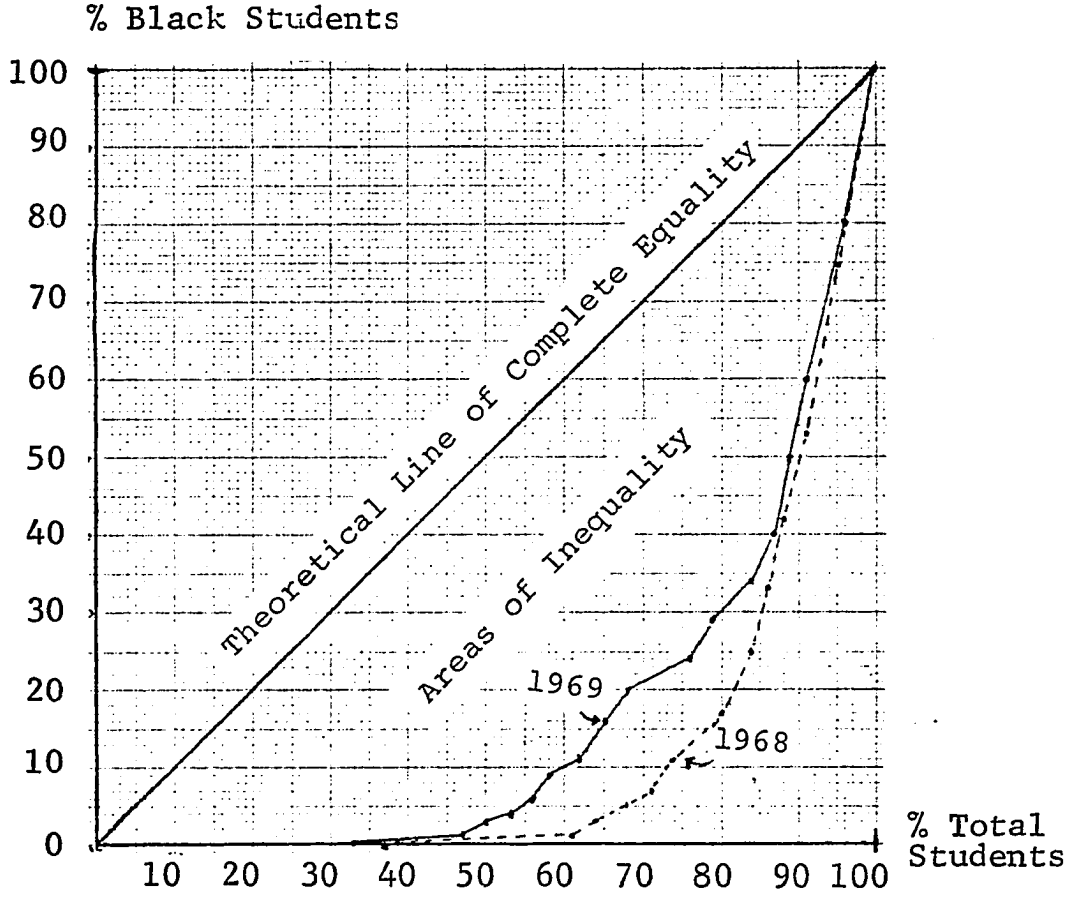

Figure 5.2. Lorentz Curves Indicating Cumulative Proportions of Black Students to Cumulative Proportions of Total Students in Oklahoma City High Schools, 1968 and 1969.

1968 Gini Index = .7520

1969 Gini Index = .6746

1968 Efficiency Index = .248 $\approx$.25

1969 Efficiency Index = .3254 $\approx$ .33

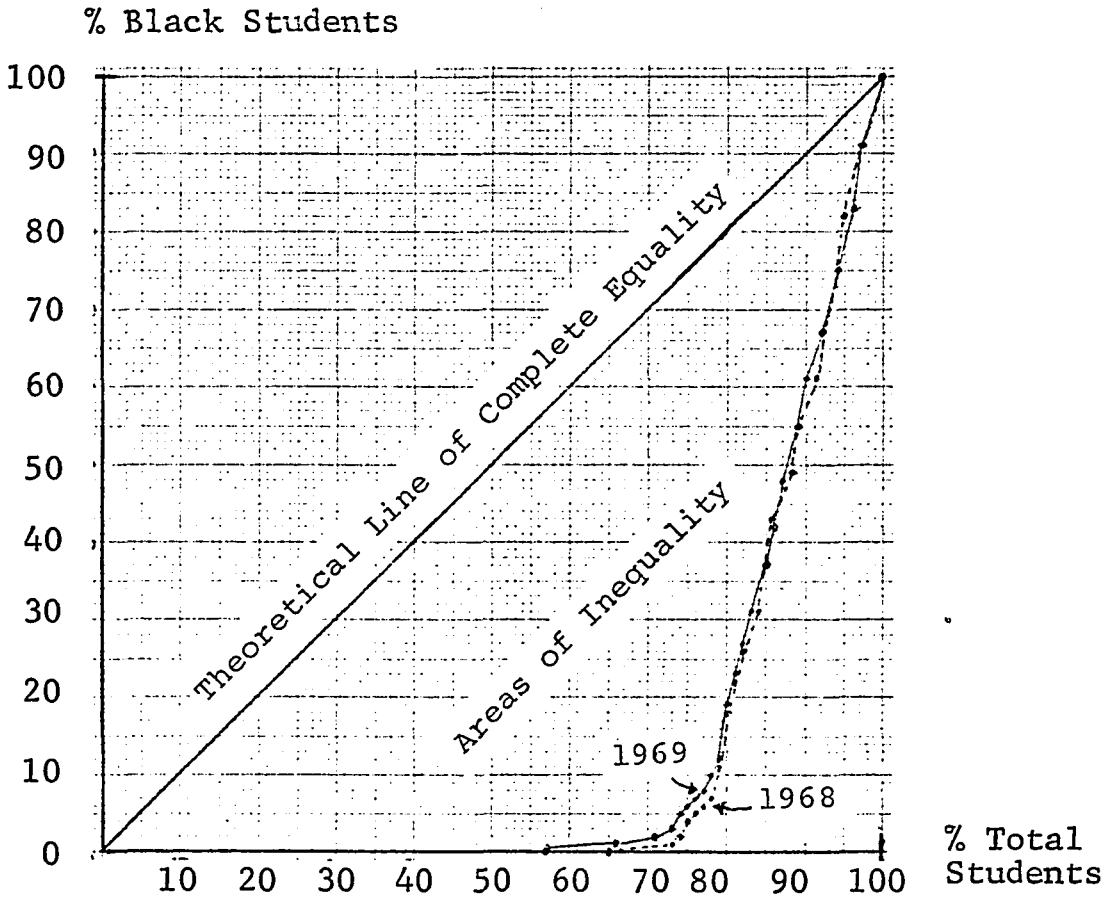

Figure 5.3. Lorentz Curves Indicating Cumulative Proportions of Black Students to Cumulative Proportions of Total Students in Oklahoma City Elementary Schools, 1968 and 1969.

1968 Gini Index = .7552

1969 Gini Index = .7476

1968 Efficiency Index = .2448 $\approx$ .24

1969 Efficiency Index = .2524 $\approx$ .25

and then the raw data would serve to further document and furnish details for these generalizations.

The theoretical line of complete equality would be approached only when each school has the same proportion of black to total students as the proportion of black to total students in the whole system. These would have been 19.9% in 1968 in the high schools, 23.0% in 1968 in the elementary schools, 21.6% in 1969 in the high schools, and 23.6% in 1969 in the elementary schools. The relatively large increase in the high school proportion from 1968 to 1969 can be explained by the increase in absolute numbers of blacks compared to a decrease in total numbers of students.[27] On the elementary school level, the number of black students went down by 147 or 1.5% while the total enrollment went down by 1,600 or 3.7%.

It can be surmised that these decreases can be explained by increases in private school enrollments and transfers to school districts outside of Oklahoma City. Unfortunately, data on these are unavailable, and really irrelevant at this point. The only purpose for using actual enrollment data is to illustrate how the goal of integration may be defined in quantitative terms. The data to

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[27]Blacks in high school increased 7.6% or by 477 between the two years, although total enrollment dropped by 184 or 0.6%.

be used in actual decision-making situations would likely be projections or estimates to help decide on different plans. On the other hand, if used to evaluate operational plans, actual data such as these would be used.

Once the goal is defined in quantitative terms, efficiency measures, in terms other than the Gini Index or its derivative Efficiency Index, can be derived. As suggested in the section "Measures of Efficiency and Their Use" in Chapter III,[28] measures of cost-efficiency, time-efficiency, effort-efficiency and their derivative alternative "percentage" measures, can be used in making the decision of selecting between alternative plans for desegregation, assuming that such data necessary for deriving the measures are available or obtainable.

Unfortunately, cost-measures by schools are not quite yet available. Dr. Bill Schell, director of the Oklahoma City Public Schools Department of Research and Statistics, feels it is not even likely within five years.[29] He explained that the present budgetting system took services, functions and district-wide programs as units rather

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[28]See pages 81-83, supra.

[29]Interview with the director of the Oklahoma City Public Schools, Department of Research and Statistics, April 7, 1970. He also expressed skepticism of the reliability of of the research findings, due to the "human factor" that enters any quantitative equation. He was however assured that in probality terms, the human factor is indicated by the error term, which can be random or even systematic as in the case of biases.

than schools. However, he was optimistic that with the institutionalization of PPBS[30] in the system "in about five years," such measures might then be available.

Administrative Costs and Size of the Public Agency[31]

The hierarchical structure of a Research and Planning Agency is illustrated in Figure 5.4. In this example there are three administrative levels and one level of "output" producers. "Span of control" in management represents the number of subordinates reporting to an administrator, and if constant, every administrator would have the same number of subordinates reporting to him as does any other administrator. While this is not likely, simulating a constant span of control simplifies calculations and illustrates general principles from which variations can occur. Variable span of control only complicates calculations, but the logic remains the same.

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[30]Planning-Programming-Budgeting System is "an approach to decision making designed to help make as explicit as possible the costs and consequences of major choices and to encourage the use of this information systematically in the making of public policy," according to Dr. Jack W. Carlson in "The Status and Next Steps for Planning, Programming and Budgeting," The Analysis and Evaluation of Public Expenditures: The PPB System, A compendium of papers submitted to the subcommittee on economy in government of the Joint Economic Committee, Congress of the United States, Vol. 2, Part IV, (Washington, D.C.: U.S. Government Printing Office, 1969), pp. 613-614.

[31]Adapted from Daniel Teichroew, An Introduction to Management Science: Deterministic Models (New York: John Wiley & Sons, Inc., 1964), pp. 42-48.

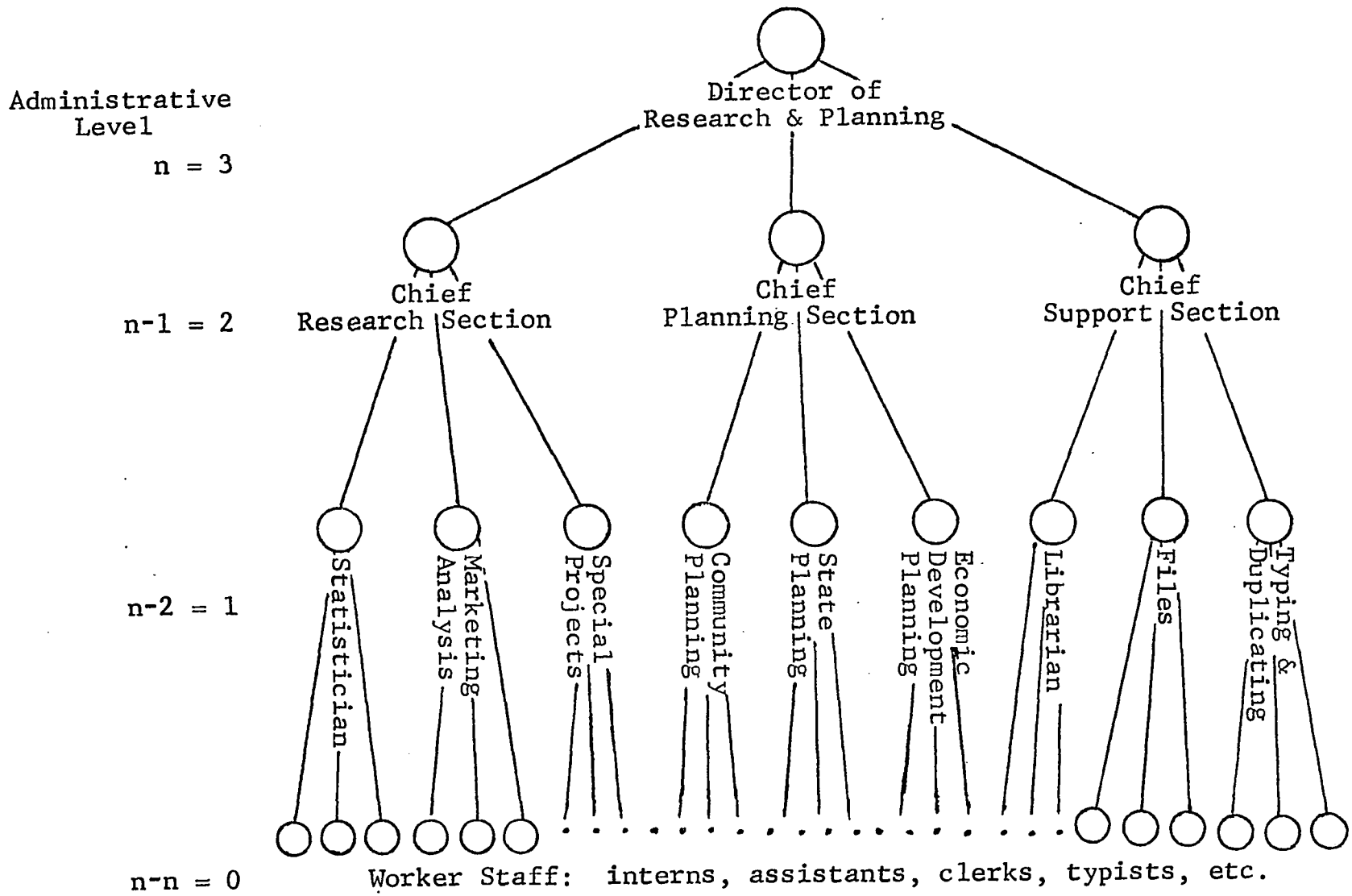

Figure 5.4. Hierarchical Structure of a Research and Planning Agency.

In our example of a hypothetical Research and Planning Agency (see figure 5.4), the span of control is 3; i.e., every administrator has three subordinates.

In general, if the span of control is constant, the number of administrators on any level will be derived by the general formula:

$$A_{n-m} = c^m \qquad (5.1)$$

where: A = the number of administrators

n = the number of administrative levels

m = the number of administrative levels above this particular one

and c = the span of control.

For example, at the highest level n, there is only one administrator, usually called a director or chief or head. This is because m = 0

and:

$$A_{n-0} = c^0 = 1$$

On the following levels:

$$A_{n-1} = c^1 = c$$

$$A_{n-2} = c^2$$

$$A_{n-3} = c^3$$

$$\vdots$$

$$A_{n-(n-1)} = c^{n-1}$$

where [n-(n-1)] represents the lowest administrative level.

In our example, with a constant span of control c=3 and n=3 administrative levels, at level 3, we have on administrator, viz.:

$$A_{3-0} = 3^0 = 1.$$

At level 2, we have three administrators, viz.:

$$A_{3-1} = 3^1 = 3$$

At level 1, we have nine administrators, viz.:

$$A_{3-2} = 3^2 = 9.$$

The total number of administrators, under these conditions, would be:

$$\text{Tot. Adm.} = 1 + c + c^2 + c^3 + \ldots c^{n-1} = \frac{c^n - 1}{c - 1} \qquad (5.2)$$

or in our hypothetical example:

$$T_a = 1 + 3 + 3^2 = \frac{3^3 - 1}{3 - 1}$$

or:

$$1 + 3 + 9 = \frac{27-1}{3-1} = 13.$$

The total number of worker staff in such a public agency would be derived by the expression:

$$T_{ws} = c^n \qquad (5.3)$$

or in our hypothetical example:

$$T_{ws} = 3^3 = 27.$$

Economists speak of "diseconomies of scale" suggesting that the size of an organization is directly related[32] to the costs per unit of its output. The main factor causing diseconomies of scale "has to do with certain managerial problems which typically arise" as an organization begins to have large-scale operations, and therewith increases its size.[33]

As McConnell suggests:

> ...It becomes impossible for one man to assemble, understand, and digest all the information essential to rational decision making in a large scale enterprise. Authority must be delegated to innumerable vice-presidents, second vice-presidents, and so forth. This expansion in the depth and width of management entails problems of coordination and bureaucratic red tape which can eventually impair the efficiency of a firm and lead to higher costs.[34]

While he was talking about private enterprise organizations, his description is still valid for public agencies, although the output may not be so clearly identifiable as in the private sector. For instance, as Levinson suggests, if $100,000.00 is spent for a training program involving 1000 persons, the total cost per person would be $100.00. However, if only 100 of these 1000 train-

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[32]As one variable increases, so does the other variable.

[33]Campbell R. McConnell, Economics: Principles, Problems and Policies (New York: McGraw-Hill Book Company, Inc., 1962).

[34]Ibid.

ees become employed, the "benefit" per capita cost jumps to $1,000.00.[35] The difference in perception or definition of output as a quantitative criterion of program effectiveness does affect cost estimates or cost analysis.

Since a public agency does not usually have "earnings" as a private enterprise is expected to, we can only speak of surpluses or deficits in our cost equation:

$$X = \sum R - \sum (C_{ws} + C_a + C_f) \qquad (5.4)$$

where: $\underline{X}$ = surplus, if $\underline{X} > 0$

or $\underline{X}$ = deficit, if $\underline{X} < 0$

R = revenue or income the public agency receives from all sources

C_{ws} = worker staff costs: wages and salaries, disbursements, etc.

C_a = administrative costs: salaries and honoraria, disbursements, travel costs, etc.

C_f = fixed costs including "overhead" such as rent, materials and supplies, etc. that do not vary with the output.

and $\sum$ = The usual summation sign.

Suppose that the output of a public agency is directly proportional to the number of the worker staff. Dividing by worker staff costs and rearranging equation (5.4) becomes:

$$\frac{X + C_f}{C_{ws}} = \frac{R - C_{ws}}{C_{ws}} - \frac{C_a}{C_{ws}} \qquad (5.5)$$

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[35] Levinson, op.cit., p. 287.

By the assumption, the difference between revenue and worker staff costs is directly proportional to the worker staff costs. $\underline{X}$, over and above the fixed costs, per unit of the worker staff costs will then increase, remain constant or decrease as the public agency increases in size, if the last term in equation (5.5) decreases, remains constant or increases respectively.

A public agency can increase its size by increasing the span of control, holding administrative levels constant, or increase administrative levels holding span of control constant, or increasing both administrative levels and span of control. Starting with our hypothetical public agency where:

$n = 3$ administrative levels

and $c = 3$ span of control,

by equation (5.2), we get:

$$\frac{3^3 - 1}{3 - 1} = \frac{26}{2} = 13 \text{ administrators,}$$

and by equation (5.3), we get $3^3 = 27$ worker staff. If this agency grows by increasing administrative levels, where span of control remains constant, we can get the following cases:

If $\underline{n} = 4$, by equation (5.2), we get:

$$\frac{3^4 - 1}{3 - 1} = \frac{80}{2} = 40 \text{ administrators,}$$

and by equation (5.3), we get:

$$3^4 = 81 \text{ worker staff.}$$

If $\underline{n} = 5$, by equation (5.2), we get:

$$\frac{3^5 - 1}{3 - 1} = \frac{242}{2} = 121 \text{ administrators,}$$

and by equation (5.3), we get:

$$3^5 = 243 \text{ worker staff.}$$

On the other hand, by increasing the span of control, and holding administrative levels constant at 3, we get the following cases:

If $\underline{c} = 4$, by equation (5.2), we get:

$$\frac{4^3 - 1}{4 - 1} = \frac{63}{3} = 21 \text{ administrators,}$$

and by equation (5.3), we get:

$$4^3 = 64 \text{ worker staff.}$$

If $\underline{c} = 5$, by equation (5.2) we get:

$$\frac{5^3 - 1}{5 - 1} = \frac{124}{4} = 31 \text{ administrators,}$$

and by equation (5.3), we get:

$$5^3 = 125 \text{ worker staff.}$$

By increasing both administrative levels and span of control, we get the following cases:

If $\underline{n} = 4$ and $\underline{c} = 4$, by equation (5.2), we get:

$$\frac{4^4 - 1}{4 - 1} = \frac{255}{3} = 85 \text{ administrators,}$$

and by equation (5.3), we get:

$$4^4 = 256 \text{ worker staff.}$$

If $\underline{n} = 5$ and $\underline{c} = 5$, by equation (5.2), we get:

$$\frac{5^5 - 1}{5 - 1} = \frac{3124}{4} = 781 \text{ administrators,}$$

and by equation (5.3), we get:

$$5^5 = 3125 \text{ worker staff.}$$

Table 5.5 summarizes the possibilities by varying administrative levels from three to five, and span of control from three to five. The numerator of the fraction represents the number of administrators while the denominator represents the number of the worker staff. As might be noted from the table, the ratio of administrators to worker staff increases as administrative levels are increased, holding span of control constant. However, this ratio decreases, understandably, by increasing the span of control holding the number of administrative levels constant;

TABLE 5.5

RATIOS OF ADMINISTRATORS TO WORKER STAFF FOR SELECTED ADMINISTRATIVE LEVELS AND SPAN OF CONTROL

Administrative Levels, n:	Span of Control, c:		
	$c = 3$	$c = 4$	$c = 5$
$n = 3$	$\frac{13}{27} = .4815$	$\frac{21}{64} = .3281$	$\frac{31}{125} = .2480$
$n = 4$	$\frac{40}{81} = .4938$	$\frac{85}{256} = .3320$	$\frac{156}{625} = .2496$
$n = 5$	$\frac{121}{243} = .4979$	$\frac{341}{1024} = .3330$	$\frac{781}{3125} = .2499$

Note: Numerator of ratio = number of administrators

Denominator of ratio = number of worker staff

but not as much as when increasing both administrative levels and span of control.

In general, the ratio of the number of administrators to worker staff is described by the equation:

$$\frac{\text{Tot. adm.}}{\text{Tot. ws}} = \frac{\frac{c^n - 1}{c - 1}}{c^n} = \frac{c^n - 1}{c^n(c-1)} \qquad (5.6)$$

which reduces to:

$$\frac{c^n - 1}{c^n(c-1)} = \frac{1 - \frac{1}{c^n}}{c-1} = \frac{1}{c-1} - \frac{1}{c^n(c-1)} \qquad (5.7)$$

This suggests that as the number of administrative levels increases, the second term of equation (5.7) diminishes. Hence, the ratio tends to the limit $1/(c-1)$; i.e., the ratio of the number of administrators to worker staff never exceeds $1/(c-1)$ regardless of the size of the public agency.

However, salaries of administrators vary from level to level. Let us investigate first the case where span of control is constant but where the salary of an administrator increases by a constant factor $\underline{s}$ times the salary of his immediate subordinates ($\underline{W}$ denotes average worker staff wages or salary):

Administrative Level	Number of Personnel	Salaries or Wages
n	1	s^nW
n-1	c	$s^{n-1}W$
n-2	c^2	$s^{n-2}W$
.	.	.
.	.	.
.	.	.
1	c^{n-1}	sW
0	c^n	W

The total administrative costs at any given level is the product of the salary at that level and the number of administrators at that level. The total administrative costs of a public agency is the sum of all administrative costs at all levels or:

$$C_a = c^{n-1}sW + c^{n-2}s^2W + \ldots + cs^{n-1}W + s^nW \qquad (5.8)$$

which reduces to:

$$C_a = c^{n-1}sW\,[1 + (s/c) + \ldots + (s/c)^{n-1}]$$

or:

$$C_a = c^{n-1}sW\left[\frac{1 - (s/c)^n}{1 - (s/c)}\right] \qquad (5.9)$$

The total worker staff cost is indicated by the product of the number of worker staff and the average wage or

salary, $\underline{W}$, or:

$$C_{ws} = c^n W \tag{5.10}$$

Hence, the ratio of administrative costs to worker staff costs is:

$$\frac{C_a}{C_{ws}} = \frac{c^{n-1} sW}{c^n W} \left[\frac{1 - (s/c)^n}{1 - (s/c)} \right] \tag{5.11}$$

which reduces to:

$$\frac{C_a}{C_{ws}} = \frac{s/c}{1 - (s/c)} - \frac{(s/c)^{n+1}}{1 - (s/c)} \tag{5.12}$$

Thus, the ratio of administrative costs to worker staff costs depends on the ratio s/c which is the "salary increase" factor divided by the span of control. The first term in equation (5.12) is a constant and does not depend on the size of the public agency. The second term, on the other hand, diminishes as the public agency increases in size, provided that the ratio $\underline{s}/\underline{c} < 1$, which is usually the case. Typically, $\underline{c}$ will vary between 3 and 7, while $\underline{s}$ rarely exceeds 3.[36]

The same conclusions reached, _supra_., can be shown to hold even with further relaxing of our assumptions. Suppose the span of control, $\underline{c}$, and salary increase factor, $\underline{s}$, are not constant throughout the levels of the public

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[36]Teichroew, _op. cit._, p. 46.

agency as is usually the case. In particular, assume a lower limit on the span of control, indicating that every administrator has at least $\underline{c}$ subordinates reporting to him; and an upper limit on the salary increase factor, indicating that no administrator receives more than $\underline{s}$ times the salary of anyone of his subordinates. The number of administrators and their salaries (where $\underline{W}$ represents the average worker staff's wage or salary) are indicated in Table 5.6. The number of administrators at the $\underline{i}$th level, N_i, is at least $\underline{c}N_{i+1}$ and each receives a salary W_i which is not greater than $s^i W_{i-1}$.

As before, the total administrative costs can be obtained by a summation of the costs at each level:

$$C_a = N_1W_1 + N_2W_2 + \ldots + N_nW_n \tag{5.13}$$

and the ratio of administrative costs to worker staff costs is:

$$\frac{C_a}{C_{ws}} = \frac{N_1W_1 + N_2W_2 + \ldots + N_nW_n}{N_0W} \tag{5.14}$$

which reduces to:

$$\frac{C_a}{C_{ws}} = \frac{N_1}{N_0}\cdot\frac{W_1}{W} + \frac{N_2}{N_0}\cdot\frac{W_2}{W} + \ldots + \frac{N_n}{N_0}\cdot\frac{W_n}{W} \tag{5.15}$$

Equation (5.15) can be replaced by an inequality

TABLE 5.6

NUMBER OF ADMINISTRATORS AND AVERAGE SALARIES

Level	Number	Average Salary
n	$N_n = 1$	$W_n \leqslant sW_{n-1}$
n-1	$N_{n-1} \geqslant cN_n$	$W_{n-1} \leqslant sW_{n-2}$
.	.	.
.	.	.
.	.	.
.	.	.
2	$N_2 \geqslant cN_3$	$W_2 \leqslant sW_1$
1	$N_1 \geqslant cN_2$	$W_1 \leqslant sW$
Worker staff	$N_0 \geqslant cN_1$	W

n = administrative level

N_i = number of administrators on the ith level

c = span of control

W = average wage or salary of worker staff

s = salary increase factor for administrators

condition if each term is replaced by a term which is larger, since:

$$N_{n-1} \geqslant cN_n$$

$$N_{n-2} \geqslant cN_{n-1} \geqslant c^2N_n$$

.

.

.

$$N_0 \geqslant cN_1 \geqslant c^nN_n$$

or:

$$\frac{N_n}{N_0} \leqslant \frac{1}{c^n}$$

and:

$$\frac{N_i}{N_0} \leqslant \frac{1}{c^i}$$

Where: $i = 1, 2, \ldots, n.$

Similarly,

$$\frac{W_1}{W} \leqslant s$$

$$W_2 \leqslant sW_1 \leqslant s^2W$$

or:

$$\frac{W_2}{W} \leqslant s^2, \ldots, \frac{W_i}{W} \leqslant s^i$$

Therefore:

$$\left(\frac{N_i}{N_0} \cdot \frac{W_i}{W}\right) \leqslant \left(\frac{1}{c^i}\right)s^i \qquad (5.16)$$

Replacing each of the terms in equation (5.15) with appro-

priate terms from (5.16) yields:

$$\frac{C_a}{C_{ws}} \leqslant \left[\frac{s}{c} + \left(\frac{s}{c}\right)^2 + \ldots + \left(\frac{s}{c}\right)^n\right]$$

$$\leqslant \left(\frac{s}{c}\right)\left[\frac{1 - (s/c)^n}{1 - (s/c)}\right]$$

$$\leqslant \left[\frac{s/c}{1 - (s/c)}\right] - \left[\frac{(s/c)^{n+1}}{1 - (s/c)}\right] \qquad (5.17)$$

The ratio of administrative costs to worker staff costs still will not increase above the same limit no matter how large the administrative levels, n, gets.

Time, Costs and Organizational Efficiency[37]

Up to this point, the analysis assumes a constant output regardless of the size of the public agency. This assumption can however be challenged by the observation that as organizations increase in size, the number of administrative levels increase, even if span of control is held constant. The operation of the diseconomies of scale[38] can be clarified by identifying the time-factor that enters the decision-making processes. Obviously, the more administrative levels there are, the more time may be required

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[37]Adapted from Teichroew, op. cit., pp. 47-51, and S. Fordham, "Organization Efficiency," Journal of Industrial Economics, Vol. 6 No. 3 (1958), pp. 209-215.

[38]Frank J. Jasinski, in "Foreman Relationships Outside the Work Group," Personnel, Vol. 33 (1956), pp. 130-136, found that the more successful foremen spent more time interacting with their peers and others outside their own work group, suggesting the discussion on p. 175 ff. infra.

to make the decision.

Let us consider the simplest case assuming the following simplifying conditions:

(1) all situations requiring decisions arise at zero-level (the worker staff level),

(2) the time required for transmission of requests for decisions and the handing down of decisions is a constant factor at each level,

and (3) all administrators make the same number of decisions.

In our example, a three-level public agency with a span of control, $\underline{s} = 3$, shown in Figure 5.3, has a total of 13 administrators. By our simplifying assumptions, 1/13th of the requests for decisions must get up to the director at the third level and will require three time-periods to reach him and the handing down of decisions another three time-periods. Similarly, 3/13th of the requests for decisions will reach the second level and decisions handed down, requiring a total of four time-periods. At the first administrative level, 9/13ths of the requests for decisions and the handing down of decisions will require a total of two time-periods. The average number of time periods required for the decisions can be derived by the formula:

$$\overline{T} = \frac{\sum_{i=1}^{n} 2[(T_i)(N_{ai})]}{N_a} \qquad (5.18)$$

where:

$\bar{T}$ = the average number of time-periods required to make decisions,

T_i = the time required to reach level i,

N = the total number of administrators at all levels, (N_a), or the number of administrators at any specific level (N_{ai})

$\sum_{i=1}^{n}$ = the usual summation sign.

In our example, formula (5.18) yields:

$$\bar{T} = \frac{2[(3)(1)] + 2[(2)(3)] + 2[(1)(9)]}{13} = \frac{36}{13} \approx 2.8 \text{ time-periods}$$

In general, if there are n administrative levels and c is the span of control, the average time required for making a decision is:

$$\bar{T} = \frac{2}{\frac{c^{n-1}}{c-1}} \left\{ 2n + 2(n-1)c + 2(n-2)c^2 + \ldots + 2[n-(n-1)]c^{n-1} \right\} \qquad (5.19)$$

which is equal to:

$$\bar{T} = \frac{2c}{c-1} - \frac{2n}{c^{n-1}} \qquad (5.20)$$

As the administrative level n increases, the second term in equation (5.20) diminishes, and hence, the average number of time-periods required for decision-making is always less than a fixed factor which is independent of the

size of the public agency.

Under these assumptions, the ratio of administrative costs to worker staff costs and the average time required in the decision-making process do not grow indefinitely but approach certain limits as the public agency increases its size. Thus, under these conditions, there need not be any serious diseconomies of scale in administrative costs with increasing size of public agencies. However, actual empirical data would be necessary to challenge the validity of these assumptions. Again, the lack of cooperation from a public agency, arising from fear of unfavorable evaluations that may result from quantitative analysis or from any other source, obviously creates obstacles to testing the validity of the assumptions of the methodology.

One of the problems not considered in the foregoing analysis is the problem of appropriate span of control. Whether one span of control was preferable to another was ignored by positing the variable, c, span of control, as given. However, in making decisions as to establishing span of control, it is obvious that tests of preference must go beyond personal, subjective preferences. If we posit a public agency's efficiency as a function of the span of control, we may define the average efficiency of the public agency as the sum of the efficiency of all its individual personnel divided by the total number of

individuals, or:

$$\bar{E} = \frac{\sum E_i}{N} \tag{5.21}$$

where:

$\bar{E}$ = the average efficiency of the public agency

$\sum E_i$ = the sum of efficiencies of all individuals in the public agency

and:

N = the total number of individuals in the public agency.

The efficiency of an individual can be defined as the time he makes available for his primary task(s) multiplied by his effectiveness, or:

$$E_i = T_{pt} \cdot E_{fi} \tag{5.22}$$

where:

E_i = the efficiency of an individual

T_{pt} = the time available for performing his primary task(s)

E_{fi} = the effectiveness of the individual.

An individual in a public agency ideally spends his time either on accomplishing his primary task(s) or on contacts with his superior, or with his peers or with those subordinate to him. Allowing $\underline{t}$ to represent the amount of time in fractions of a basic time period such as a work-day or a work-week, which an administrator spends with each of

the individuals with whom he is in contact, an administrator at the second level with $\underline{c}$ subordinates, $\underline{c}$-1 equals and one superior at the third level, spends a total amount of time as designated by the equation:

$$ct + (c-1)t + t = 2\underline{ct}.$$

Since such time will have to be regarded as being not directly performing his task(s), the time available for an administrator on the second level to perform his primary task(s) will be 1 minus such time spent on these contacts or:

$$\text{Time available for second-level administrator} = 1-2\underline{ct} \qquad (5.23)$$

Such time spent by an administrator with others is not necessarily completely wasted, since such contacts, in fact, enable him to specialize.

Assume that an individual working by himself has an effectiveness of 1 and that the factor $\underline{p}$ represents the increase in effectiveness due to specialization. If an administrator has $\underline{c}$-1 equals, his effectiveness becomes:

$$\text{Effectiveness of second-level administrator} = 1+(c-1)p \qquad (5.24)$$

The same definitions and assumptions can be made respecting the other levels, assuming the coefficients $\underline{t}$ and $\underline{p}$ are the same for all levels. The time available

and effectiveness for the public agency depicted in Figure 5.4 is summarized in Table 5.7 with generalization format and actual figures.

The average efficiency of the administration of a public agency by equation (5.21), is the sum of the efficiencies of all administrators divided by the total number of administrators, or, for our hypothetical agency with three levels of administration and a span of control of three:

$$\text{Average Efficiency} = \frac{\text{Total Efficiency (level 3)} + \text{Total Efficiency (level 2)} + \text{Total Efficiency (level 1)}}{\text{Total Number of Administrators}}$$

or:

$$\bar{E} = \frac{(1-ct) + c(1-2ct)[1+(c-1)p] + c^2(1-ct)[1+(c-1)p]}{1 + c + c^2}$$

or, using the figures from Table 5.7:

$$\bar{E} = \frac{(1-.30) + 3(1-.60)[1+2(.05)] + 3^2(1-.30)[1+2(.05)]}{1 + 3 + 9}$$

$$= \frac{.70 + 3(.40)(1.10) + 9(.70)(1.10)}{13} = \frac{.70 + 1.32 + 6.93}{13}$$

$$= \frac{8.95}{13} = 0.69$$

Figure 5.5 indicates the relationship between average efficiency and span of control for some particular values of

TABLE 5.7

TIME AVAILABLE, EFFECTIVENESS AND EFFICIENCY IN A PUBLIC AGENCY WITH THREE ADMINISTRATIVE LEVELS AND A SPAN OF CONTROL OF THREE.[39]

		Level of Administrators		
		3	2	1
1.	Number of direct contacts with subordinate administrators	c=3	c=3	c=0
2.	Number of direct contacts with peers	0	c-1=2	c-1=2
3.	Number of direct contacts with superiors	0	1	1
4.	Total number of direct contacts	c=3	2c=6	c=3
5.	Time per contact	t=.10	t=.10	t=.10
6.	Total time spent with contacts	ct=.30	2(ct)=.60	ct=.30
7.	Time avaliable	1-ct=.70	(1-2ct)=.40	(1-ct)=.70
8.	Effectiveness of the individual	1	1+(c-1)p=1.10	1+(c-1)p=1.10
9.	Efficiency of the individual	(1-ct) =.70	(1-2ct)[1+(c-1)p] =(.40)(1.10)=.44	(1-ct)[1+(c-1)p] =(.70)(1.10)=.77
10.	Number of administrators	1	c=3	c^2=9

[39]Assume $\underline{t}$ = .10 or 10 per cent of an eight-hour work day; and $\underline{p}$ = .05 or 5 per cent improvement in effectiveness due to specialization.

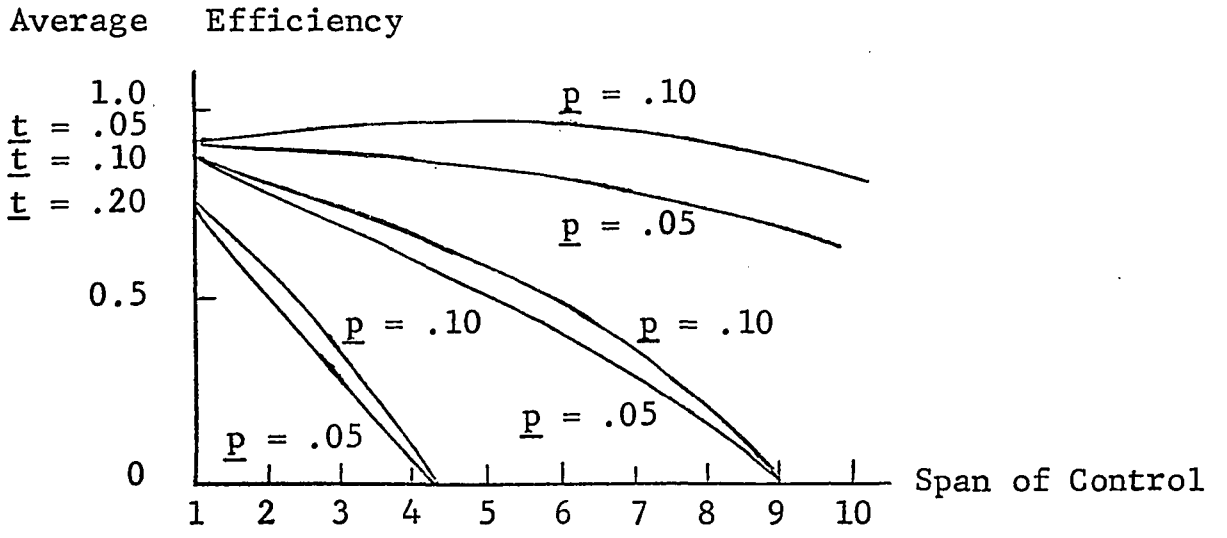

Figure 5.5. Average Efficiency as Functions of Different Spans of Control.

c. The values of t, .05, .10 and .20 represent expenditures of 5, 10 or 20% respectively of total time available on each contact; and the values of p, .05 and .10 represent 5 and 10% improvements in effectiveness due to specialization. Figure 5.5 indicates that if t=.05 and p=.10, the average efficiency is highest at a span of control of approximately 6.[40] For lower values of p and/or higher values of t, the average efficiency decreases from c=1.

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[40]This appears to run contrary to the traditional recommendation that the ideal span of control should not exceed five or six and that the ideal number is four. See L. Urwick, "Executive Decentralization with Functional Coodination," The Management Review, Vol. 24 (1935), p. 359; and Ralph C. Davis, The Fundamentals of Top Management (New York: Harper & Brothers, 1951), p. 276. James C. Worth, in his "Organizational Structure and Employee Morale," American Sociological Review, Vol. 15 (1950), pp. 169-179, however suggests that both employee morale and operating efficiency increased with broader span of control and the resultant flatter type of managerial structure.

CHAPTER VI

MAXIMIZING PARTICIPATION AS AN OPERATIONAL PUBLIC RELATIONS GOAL

The Goals of Public Agencies

The fundamental function for which public agencies exist is service to the people -- all of their activities can only be legitimate to the degree that they can be related to this fundamental function. It is only by this common character or expectation that we can logically and appropriately consider a large number of public agencies with a variety of forms and functions. Even if each specialized agency is expected to have its own unique set of quantitative measures of effectiveness, the logic of deriving them from their own unique goals, which in turn only represent a specialized dimension of the fundamental service function, would be the same. An effort to improve such specialized service then obligates any and all public agencies to identify, categorize and document their goals, objectives and programs. Goal identification then is a logical, necessary, first step that has to be taken

in any rational agency operation.[1]

The goals of government can be functionally subdivided into the specific goals of particular public agencies.[2] An organizational structure that is based on functions hence appears preferable to a burgeoning bureaucracy which merely operates in chaos with little else propelling it but historical momentum. Focusing on the functions of government, or on those of the specific public agencies in it, facilitates focusing attention on the results of all or any of the programs and activities. This way, it is not too easy to be dazzled by intricate and mystifying processes and procedures if they do not have any measurable, relevant and significant consequences.

The listing and comparison of goals in quantitative terms, moreover, can allow the identification of potential and actual sources of waste as may occur in the duplication

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[1]Joseph L. Massie, "Management Theory," in Handbook of Organizations, ed. James G. March, (Chicago: Rand McNally & Company, 1965), pp. 389-390. Cf. Henri Fayol, General and Industrial Management, tr. Constance Stours (London: Pitman Publishing Company, 1949); Luther Gulick and L. Urwick, eds., Papers on the Science of Administration (New York: Institute of Public Administration, 1937), p. 122; and John M. Gaus, Leonard D. White and Marshall E. Dimock, The Frontiers of Public Administration (Chicago: University of Chicago Press, 1936), pp. 66-67.

[2]Cf. Goals for Texas, Phase One (Austin: Office of the Governor, Division of Planning Coordination, 1969), although these goal statements are not made in terms of priorities or choices among goals.

of programs and activities or in the overlapping areas of concern. It can facilitate the identification of goals or areas of concern about which little or nothing is done. It can also facilitate the identification of areas or activities requiring more adequate control and/or more effective coordination.

The planning process requires the identification of basic goals of government in order to provide a framework within which the specific functions and activities of its public agencies may be evaluated and coordinated.[3] It is also necessary that the same identification be done for specific public agency goals to provide a similar framework within which specific programs and activities can be evaluated and coordinated. (See Figure 6.1.)

Evaluation is entailed in deciding between alternative courses of action to be undertaken, as well as in deciding whether to continue or to terminate a program or even a particular public agency's existence. Either activity can be done rationally, only when a prior identification of goals is made, establishing the framework within which evaluation can be meaningful. Setting up requirements

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[3]Cf. L. Urwick, "The Function of Administration" in Gulick and Urwick, op. cit., specially pp. 120-125. For a critical view of the numerous assumptions of the reorganization movement following the Second World War, see Marshall E. Dimock, "The Objectives of Governmental Reorganization," Public Administration Review, Vo. 11 (1951).

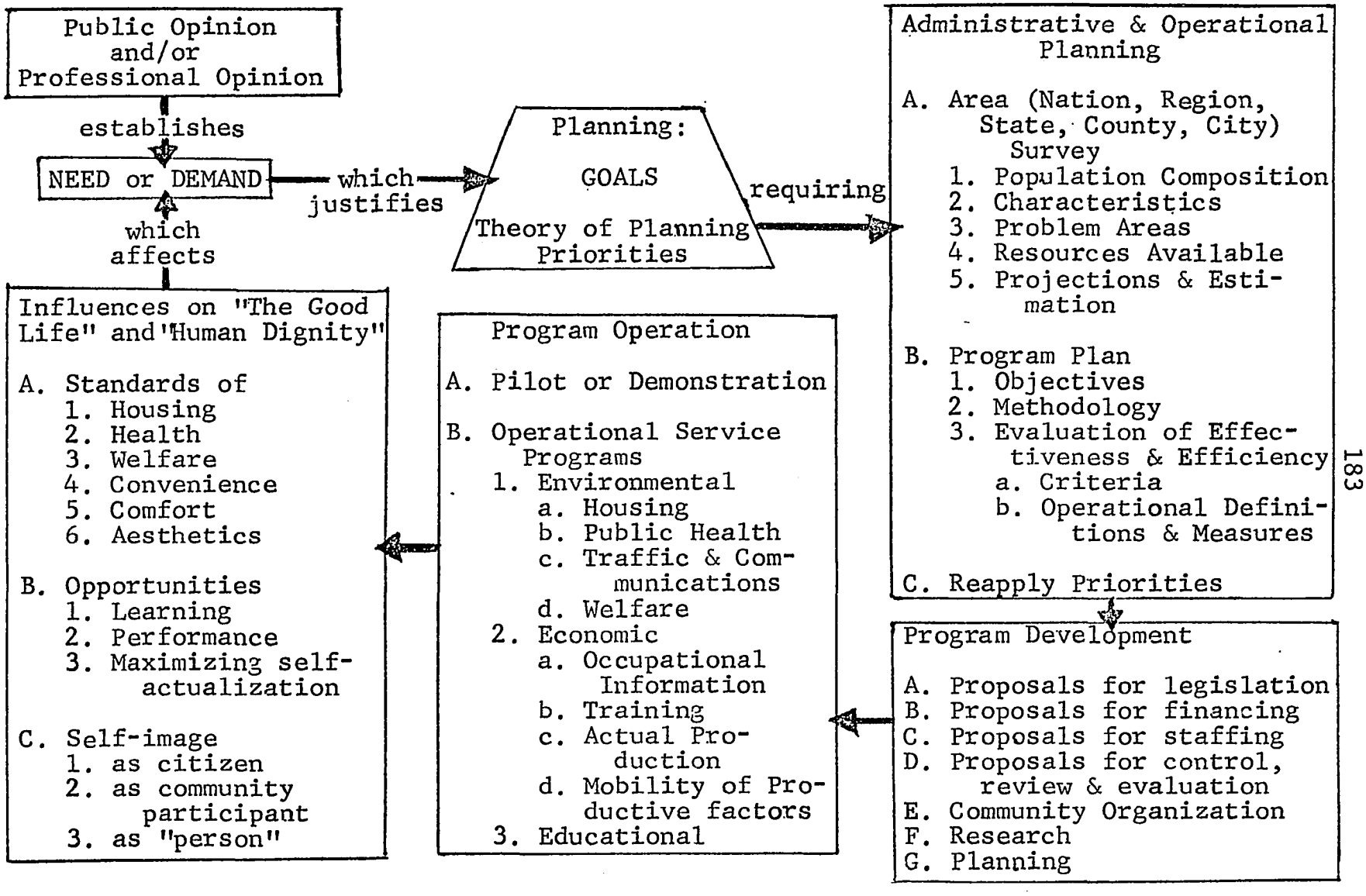

Figure 6.1. A Model for Program Planning, Development, and Evaluation.

for new programs can be similarly expedited when this logically prior step of goal-identification is made.[4]

Statements of goals are ideally made in terms of listing priorities or choices. Suggested levels of allocation of both public and private resources can be made, although these cannot be too detailed or mandatory, particularly for the private sector in a free-enterprise, market economy. Quantification of levels of service to be provided the public would, however, be more desirable. It can provide the rational bases for making choices between alternative programs, plans and policies: Quantification readily lends itself to the process of learning in advance how much service or benefits can be expected from a certain amount of investment.

Altschuler believes that the basic requirement for goal statements to be accepted politically is "to state goals on which all reasonable men can agree."[5] Furthermore, he feels that "goals must be politically and intellectually compelling for politicians to take note,"[6] unless there is a very strong consensus which is only likely

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[4]Cf. the efforts of the Hoover Coomission from 1948, or, in Louis W. Koenig, ed. "The Hoover Commission: A Symposium," American Political Science Review, Vol. 43 (1949); and Commission on Organization of the Executive Branch of the Government, A Report to the Congress (Washington, D.C.: U.S. Government Printing Office, 1949).

[5]Altschuler, op. cit., p. 320.

[6]Ibid., p. 333.

to come about if there is public discussion of these goals. He asserts that unless there are such discussions, politicians cannot and will not make informed choices among them, unless there is a very strong consensus. In recommending what he calls "middle range goals," characterizing them as being general in nature yet still operational for the planners' and administrators' purposes, he claims that such goals would allow "meaningful political discussion and approval of planning goals,"[7] and allow for a more democratic planning process.[8]

Traditional cost/benefit analysis serves very little in determining the effect of goals and policies on the operations of any public agency. Unless people are convinced that an agency's operations or any of its plans or programs reflect their interests, beliefs and values, continued support for such agency or its programs can be replaced by agitation, non-cooperation and outright withdrawal of support. The functional necessity of recognizing a public-relations function for the public agency and a public-oriented or public-sensitive goals formulation program would thus be clear.

Davis delineates the six important elements necessary for the development and implementation of a goals formulation

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[7] Ibid., p. 324.

[8] See discussions in Chapter IV, pp. 99-107 on "Goals and the Planning Function," supra.

program:

(1) community elite participation at the initial development level,

(2) a full-time staff and adequate budget,

(3) local planning offices as co-sponsors of the goals,

(4) the formulation of different areas on administrative level goals,

(5) guidance by an executive committee of the power elite,

and (6) participation of many kinds of citizen groups.[9]

This last element represents the democratic orientation and the basis for the public relations function of the public agency. This sense of participation may be maximized in reality as well as in the illusion that may be forced upon the public by an unscrupulous bureaucrat. From a goals-method approach by a public agency in a democratic setting, this sense of participation can be insured only by citizen participation in the goals-formulation process -- whether at the beginning of a plan or project, or as an on-going function of the public agency.

Sources of Goal Statements

There are four general types of sources for informa-

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[9]Davis, op. cit., pp. 158-159.

tion concerning goals of public agencies:

(1) Institutional - representing documents like legal enactments including resolutions and laws, political party platforms, actual existing plans, etc.

(2) Technical Research - including systematic attempts at model building, simulation, operations research, systems analysis, etc.

(3) Surveys - polling attitudes by questionnaires, probing and depth interviews, etc.

(4) Citizen Participation - committees, citizen boards and community action councils.

These types are not mutually exclusive and, hence, can judiciously be used in combination. For instance, the public agency and its personnel can be definitely represented in the first and third types, since agency documents can be analyzed and agency personnel can be surveyed. The second, technical research, represents professional effort that may be done by an outside agency or individual, as well as by the agency itself, by some component office in it or at least by one qualified researcher in it. It becomes fairly obvious then that the listing represents a continuum of increasing public involvement, without necessarily excluding actual involvement of the public agency itself. This is certainly obvious in the fourth type — citizen participation. While this type generally includes

any or all attempts to have citizens directly participate in the goal-identification process, the public agency personnel are by no means to be excluded from this category.

The traditional sources of information for goals of public agencies are the institutional sources, typified by the different legislative bodies, like both national and state congresses, and the city councils. Documents like constitutions, political party platforms, organizational manuals, while not exactly their output, as are laws or ordinances, are ultimately related to them and their functioning. Very often, these documents and output can be scrutinized to identify stated goals and analyzed to reveal implied goals. Particularly in legislative acts creating a public agency, if the goals are not explicitly stated, they can be deduced from statements of the functions and duties with which it is charged.

Statements concerning the goals of a public agency can also possibly be found in the records of the output processes of these deliberative bodies, such as the journals, proceedings and minutes of these deliberative assemblies; or the reports, hearings and records of its component committees or sub-committees. Goals may also be gleaned from public pronouncements made by institutional leaders, such as the President's "State of the Union" message to Congress and the nation, or its equivalent on the state level, the governor's "State of the State" mes-

sage, etc.

More accurately however, these direct statements may actually be delineations of specific tasks or policies from which the goals might be deduced. It must be recalled that policies represent more general conditions and imply longer-term conditions than do tasks. There is overlap here, but policies tend to take two to four years to achieve. Policies, as general directives, can also take on a more general format in giving direction to agency activities and efforts rather than completion of specific programs. Like tasks, policies represent means rather than ends, which goals represent. Rather than describing specific conditions, policies generate direction that unifies specific tasks. They dictate priorities for specific administrations, which, in turn, represent criteria for evaluating tasks and projects during the particular administration's term. Policies, in turn, only acquire meaning and significance to the degree they are consistent with goals, which are considerably long-range.[10]

It must, however, be kept in mind that the goals that are stated in or implied by these sources often represent the past; that they are the products of different times. Needs and situations must be considered in the de-

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[10]See Chapter II, particularly the discussion on "A Hierarchy of Goals, Objectives, Policies and Tasks," pp. 51-56, supra.

lineation of goals, which, of necessity, are oriented to the future. Time-horizons and images of the future vary tremendously and are often a function of the prevailing human and social conditions.[11] The limitations of goals articulated in the past must hence be recognized and kept in proper perspective. While they can provide information about past and present values or ideals, and even supply information about the relationships between these values or ideals and the objectives, policies and specific tasks that they entail; at best, they serve only as starting points -- as spring boards from which goal development only proceeds, not ends.

Technical research, including systematic attempts at model building, computer simulation, operations research, systems analysis, etc., is another source of information for the goal identification process. It is not, however, meant to be used exclusive of the other methods. Principally, its function is one of establishing both the theoretical and practical frameworks for the goal-identification process. In indicating the elements of the goal-identification process and their relationships to one another as well as to other relevant segments of society, technical research serves to create the theoretical frame-

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[11]Stan Shively, "Socio-Economic Class Differences in Temporal Horizons," paper delivered to the Annual Meeting, Southwestern Sociological Association, New Orleans, April 8, 1966.

work within which the goal-identification process is to be understood. The theoretical constructs naturally do not come out of the blue. They are to be grounded in fact, thus necessitating institutional and documentary analysis as a prior step in the research design. Thus, the various information sources are integrated, rather than seen as competing or exclusive domains. Technical research establishes the points of complementation: Areas of duplication and overlap, and therefore of waste, are identified in order to be minimized or avoided.

In indicating the procedures that may streamline or make more effective the goal-identification process, as well as the rational functioning of the public agency, technical research serves as a practical framework for the operation(s). Guidelines and cues are more readily identified: Prescriptions for more efficient and more effective prodecures can be more readily made when based on realistic premises and when limiting conditions are recognized for which are made appropriate adjustments or allowances.

Surveys, total or sample, represent still another, and complementary, source of information for the goal-identification process.[12] The ideas and opinions of rele-

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[12]Davis, op. cit., says that polls and opinion surveys can provide the planner with information on the definition of areas of concern, initial citizen participation in the program of goals-formulation and delineation of areas in which information is needed, p. 142.

vant decision-makers can be surveyed by various means like simple interviews and mailed questionnaires, or by the more elaborate techniques of panel interviewing and extensive use of more sophisticated projective techniques of psychological testing. Surveys may also be extended down into the publics served and publics-in-contact: again either as total surveys or sample surveys of different sorts.[13] These extensions may include persons or categories outside the public agency: other decision-makers, as well as other opinion leaders, and even the common man in the street.

Different sampling designs can be devised to maximize representativeness of samples within given time, financial and other resource limitations,[14] as well as

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[13]Stratified samples, cluster samples, availability or accidental samples are perhaps the most prominent types. For more detailed discussions on sampling surveys, see: W. G. Cochran, Sampling Techniques (New York: Wiley, 1963); W. E. Deming, Some Theories of Sampling (New York: Wiley, 1950); R. H. Hansen, et al., Sample Survey Methods and Theroy (New York: Wiley, 1963), Vol. I; F. F. Stephan and P. J. McCarthy, Sampling Opinions: An Analysis of Survey Procedure (New York: Wiley, 1963); F. Yates, Sampling Methods for Censuses and Surveys (London: Griffin and Co., 1953).

[14]For best discussions on sampling designs, see pertinent sections in: Russell L. Ackoff, op. cit.; Leon Festinger and Daniel Katz, eds., Research Methods in the Behavioral Sciences (New York: Holt, Rinehart and Winston, 1953); Claire Selltiz, et al., Research Methods in Social Relations, rev. one-volume ed. (New York: Holt, Rinehart and Winston, 1961); Julian L. Simon, Basic Research Methods in Social Science: The Art of Empirical Investigation (New York: Random House, 1969); Pauline V. Young, Scientific Social Surveys and Research (4th ed.; Englewood Cliffs, N. J.: Prentice-Hall, Inc. 1966).

achieve the purposes for which the survey is in fact intended to discover or undertake. Again, the use of the Gini Index or its derivative Efficiency Index could be indicated at this point. The type and quality of information obtained from a sample survey depends on a variety of factors: composition of sample, types of questions asked, the manner in which these questions are asked -- all of which may generate potential errors in responses, data processing and analysis.

A source of difficulty with attitude surveys is the tendency of people

> . . . to form their wants on what they conceive possible to achieve. . . . It is only after a long process in which people are stimulated to consider new alternatives and understand their consequences can they develop a meaningful set of opinions. . . . People will not organize to obtain something that seems both technically and politically impossible.[15]

At best then, surveys, whether total or sample, can only perform a "feedback" function in an on-going, opinion-generating or public educational process, rather than as an alternative to other goal-formulating programs. Its utility is in operationalizing, on the level of the individual members of the various publics of a public agency, whatever goals may be formulated by other means. By the results of the survey may be confirmed or disconfirmed,

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[15]Lisa R. Peatie, "Reflections on Advocacy Planning," AIP (American Institute of Planners) Journal, Vol. 34, No. 2 (March, 1960), p. 85.

altered or updated, statements of goals in relation to expectations.

Another source of difficulty with surveys is their superficiality in reflecting only the current opinions and attitudes of the publics served or publics-in-contact. Furthermore, they provide a consensus only about existing programs and functions or conditions.[16] Opinions given and private action may not be consistent. Particularly confounding are opinions generated by desires to show off, or those respondents who feel they are expected to verbalize, even if they do not really believe in them -- all of which comes under the social psychological phenomena in the public opinion area known as: class bias, "halo" effect, "demonstration" effect, cognitive dissonance, and the selective processes of exposure, perception and retention.

Citizen participation has rather obviously utilitarian functions beyond merely gathering information. By publicizing the extent of, or even at least, the fact of citizen participation, the democratic norm is somehow satisfied. It also has the added bonus of a sense of responsibility being generated and its source enlarged or expanded.

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[16]Margaret T. Shaffer, "Attitude Assessment Techniques," The Planner in Emerging Urban Society, Confrontation Proceedings of the 1965 Annual Conference of the American Institute of Planners, Washington, D.C., 1965, p. 98.

Citizen participation is indeed the very heart of a political process rather than a planning procedure. It not only generates opinion but involvement and commitment.

The different types and extents of citizen participation modes will be discussed at greater length and in more detail in the last section of this Chapter. The problems generated by, or attendant to these different modes will be discussed with the specific advantages and requirements for each mode. For now, suffice it to say that neither citizens nor professional planners or agency experts can propose or evaluate all the consequences of the goal(s) of any public agency, let alone all of them. The utilization of the different methods require some collaboration of all the sources in the goal-formulation as much as in the implementation activities. Each of the methods have a special contribution it can give to the goal-formulation process. They are not mutually exclusive. However, not all the basic methods of determining organizational goals -- documentary research, questionnaires, probing and depth interviews, conference method, and informant-panel method -- are equally applicable in determining public agency goals. They can sometimes yield different, and even contradictory results. This condition further complicates the problem of identifying the real goals of a public agency as contrasted with perceived goals which may vary with the source of information.

Goals and Their Normative Function

Goals can be general or specific; they may pertain to function or some territorially-definable context for fulfillment. Goals represent "preferred future behavior" where an agency's various programs represent "actual manifestation of agency efforts to attain goals." (See Figure 6.2.) Similarly, research and planning offers "predicted future behavior," public relations can project the agency's image in terms of "perceived present behavior," while its various programs are the "actual mainfestations of agency efforts to attain these goals." Solid lines, again as before, represent direct lines of control or effect; broken lines represent the feedback loops between the system components.

Public agencies in a democratic political setting are expected to pursue only those goals that are consistent with the goals of the more comprehensive political system of which it is a part, or in which it is formed. In point of fact, it is not unusual to find the legitimate goal(s) of a public agency in the legislative act creating it, identified in terms of some more general goal(s) of the larger political system. Federal agencies then represent attempts to fulfill national goals; while state agencies, state goals; and local agencies, community goals. Requirements of effectiveness and efficiency, therefore, require a diminution of the degree to which there is confusion in the goals of the higher-level political system, or a lack of consistency

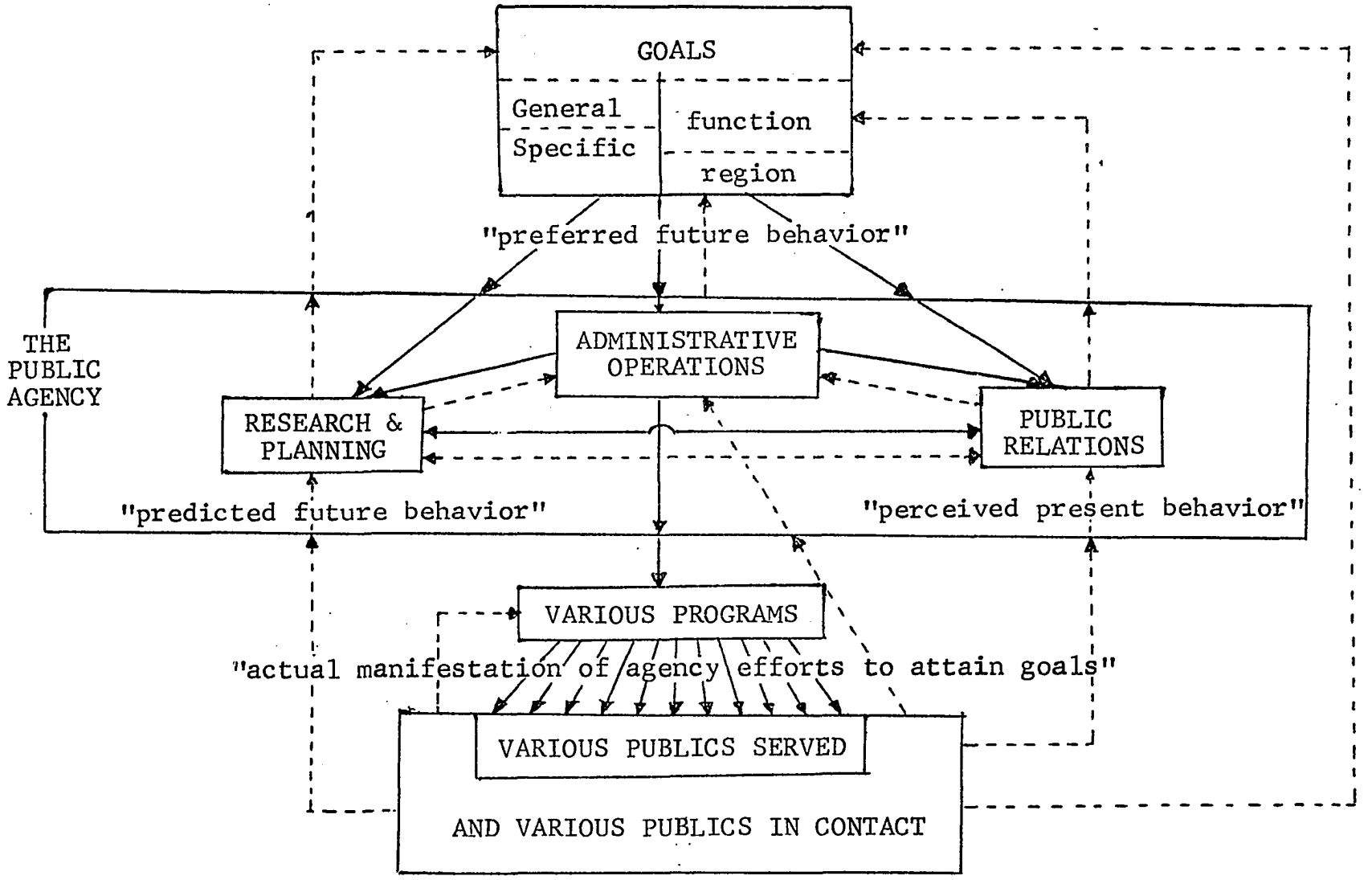

Figure 6.2. Goals, Public Agency Operations, Programs, Publics and Their Interrelationships.

between goals of different level systems, or even the lack of recognition of how the public agency's goal(s) mesh in with the more general goals of higher level political systems that subsume it.[17]

It is not necessary to inquire into all of the goals of the higher level political systems preparatory to investigation of any public agency's goal(s). It is however important, that an adequate recognition is made of the goals of the greater political structure that are to be pursued by the public agency. It is quite possible that a public agency will pursue only one or a few of the goals of the nation, or of a state, or even of a local community. It is even very likely that on any of these levels, a public agency may only contribute to some aspect of attaining one goal or a few of the goals: this "contributive" character of a public agency's goal-directed processes can only have partial -- not total effect! Specialization and division of labor indeed make it unlikely for a public agency to be so over extended as to pursue adequately a wide variety of goals.

At best, goals can direct the allocation of society's relatively scarce resources: human, financial, technical

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[17]See James L. Sundquist, with the collaboration of David W. Davis, Making Federalism Work (Washington, D.C.: The Brookings Institute, 1969), particularly Chapter 1, pp. 1-31 et passim. Cf. Goals for Americans: The Report of the President's Commission on National Goals (New York: Prentice-Hall, Inc., 1960), passim.

and material resources (including time). More than likely, however, resources place limits on goals. Goals also are restricted by the structural constraints such as the constitutional, ideological, political, economic, legislative, inter-agency relations, organizational and personality considerations. (See Figure 6.3.) Again, in the model, solid lines indicate direction of control or effect, broken lines, "feedback."

The conditions of society's resources moreover, are instrumental in shaping a sense of urgency relating to the goals: This accounts for the solid line directed toward goals. The structural constraints are the definitions, values, commitments and conditions that determine the goals and affect the agency's perception of them. Institutionally, they represent the four types or sources of authority representing factors essential to effective coordination of a public agency's activities as well as promoting inter-agency cooperation. These are particularly important, in view of the different levels of operations of the various public agencies and their overlapping territorial concerns or responsibilities. These are: (1) financial authority, (2) political authority based on election by popular vote, (3) political authority based on relative position in an organizational hierarchy, and (4) internal authority based

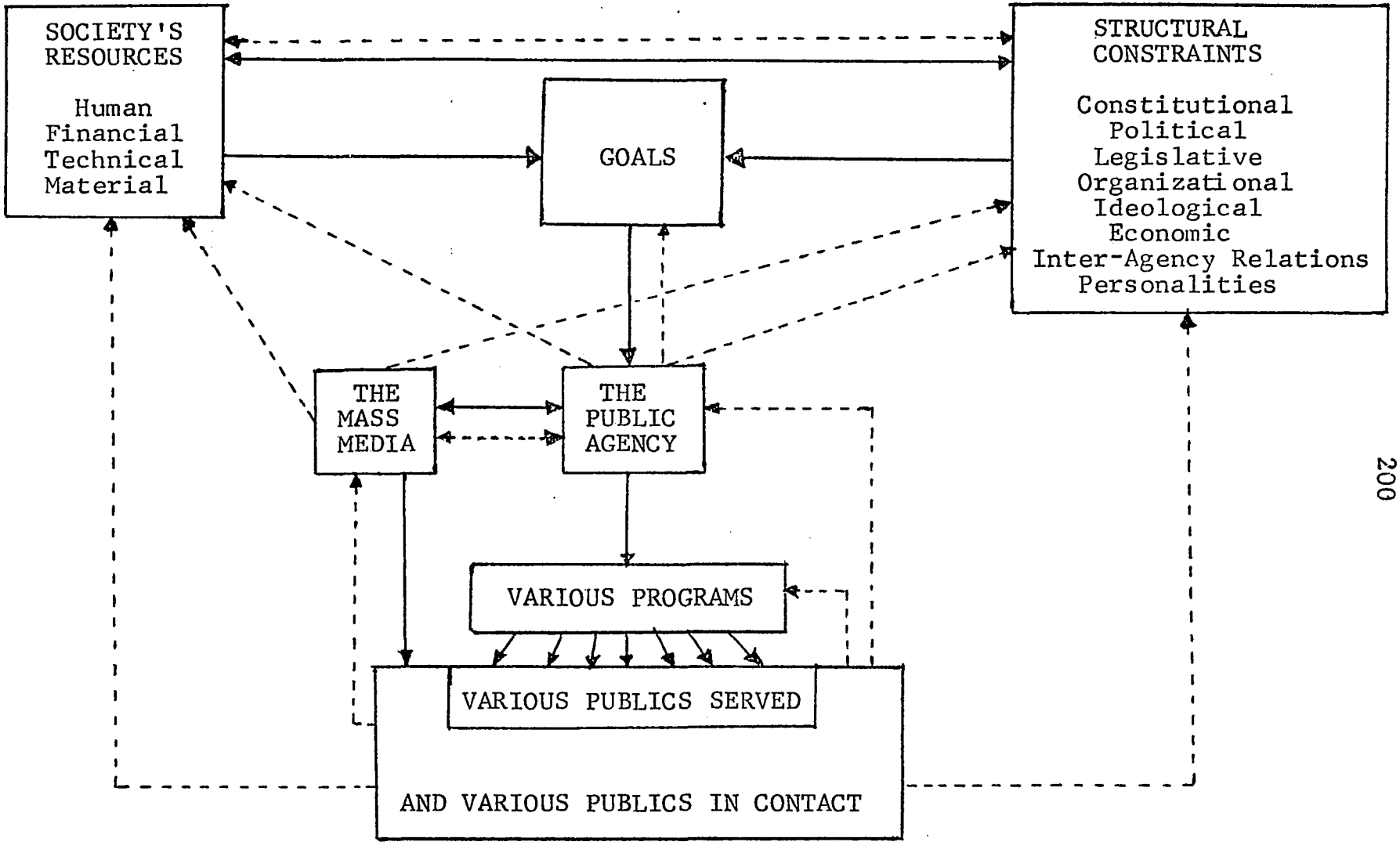

Figure 6.3. Society's Resources, Structural Constraints, Goals, The Public Agency, Its Various Programs, the Mass Media, Publics and Their Interrelationships.

on the power to hire, fire, or adjust personnel.[18] These types of authority do not necessarily rest exclusively with different individuals or organizations - it is quite possible that an administration or an individual administrator may wield all four types of authority. The conceptual differentiation merely serves to heighten the expectation of differential impact of influence by various administrations or admimistrators. The conceptional differentiation is also useful in suggesting the possibility of locating these different types of authority in different persons, or even in different public agencies -- and furthermore, that these types of authority can exist on different levels of agency operation, as well as vary in degree wherever located.

The control of relatively limited financial resources represents a relatively significant source of power or leverage in the public sector. Since financial support of a public agency's programs and activities generally come from outside the agency, virtually no public agency is autonomous with respect to this type of authority. Moreover, the size of a public agency's budget is directly related to its position in the hierarchy of organizations,

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[18]Adapted from "The Design and Implementation of a State Occupational Training Information System (OTIS) Based on the Needs of Oklahoma (Proposal submitted to the Manpower Administration, U.S. Department of Labor)," November 1, 1968, pp. 45-48.

regardless of its effectiveness or efficiency, or even, of its impact on the achievement of the larger political system's superordinate goal(s).[19]

If however, the extent of financial control is made a function of some measurable achievement of operational, or better yet, quantifiable goals, the concern for a public agency's prestige can be expected to become secondary to the desirability of operational responsibility. Therefore, to minimize waste by the arbitrary use of public funds, agencies on different operational levels that represent the major sources of financing should have the strongest commitments to operationalizing, and possibly quantifying goals, as well as accept primary responsibility for achieving them. These are the only types of goals that will readily provide meaningful measures of agency effectiveness and facilitate identification of the extent of this responsibility.

Although political authority based on election by popular vote is relatively temporary and often limited to the appointment of relatively few administrative positions, elected officials still enjoy both prestige and power far beyond that of the average career administrator. The influence of these elected officials pervades public agency

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[19]Muzafer Sherif is credited with the concept of "superordinate goals," discussed in Muzafer Sherif and Carolyn W. Sherif, op. cit., pp. 317-328.

operations and activities, often determining not only their direction, but also circumscribing their extent by effectively setting up conditions and constraints on them. Therefore, to maximize support of elected officials who may belong to different political parties, representing different interests and commitments, the insistence on some superordinate goal(s) would have to avoid clearly partisan issues.

The same superordinate goal(s) can be seen as the logical base for political authority based on relative position in the organizational hierarchy. Since public agencies are ranked in a hierarchical fashion, greater political authority accrues to the top-level agencies -- presumably due to their primary responsibility toward the achievement of the larger political structure's goal(s). Or between competing agencies on the same operational level, the identification of some superordinate goal(s) enables them to resolve their conflict of interests, alter the prevailing norms and relationships within and between agencies, and induce changes in each of the organizations and individuals that can be expected to be supportive of the agency's position regarding the superordinate goal(s) or inter-agency interactions. In addition, responsibility for inducing or introducing innovations, which are normally considered dysfunctional, can thus be shared and, more importantly, the burdens and costs of introducing innovations can be minimized.

The internal authority based on the power to hire, fire or adjust personnel is more relevant to activities and relations within a public agency rather than between agencies. Its effectiveness in directing public agency processes and activities is often circumscribed by the operation of a merit system[20] that allows the retention of personnel or structures because of purely tenure or seniority considerations, rather than expertise or effectiveness. If each public agency sets up its goals in such a manner as to derive operational or quantitative measures of effectiveness, administrators can use them to direct agency operations and to provide constant feedback on personnel performance. In this way, the replacement input function of the public agency as system can be performed on a more rational basis; economy and efficiency within the agency possible only when superfluous and unnecessary components are trimmed or replaced.

As Appleby puts it, in a democratic setting, public agency administration:

> ...differs from all administrative work to a degree not even faintly realized outside, by virtue of its public nature, the way in which it is subject to public scrutiny and outcry. An administrator coming into government is struck at once, and continually thereafter, by the press and public interest in every detail of his life, personality,

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[20] See O. Glenn Stahl, Public Personnel Administration (5th ed.; New York: Harper & Row, Publishers, 1956), particularly Chapter 3, "The Development of the Merit System," pp. 26-48.

> and conduct. This interest often runs to details of administrative action that in private business would never be of concern other than inside the organization. Each employee hired, each one demoted, transferred or discharged, every efficiency rating, every assignment of responsibility, each conversation, each letter, has to be thought about in terms of possible public agitation, investigation, or judgment.[21]

This explains the rather prominent position of the Mass Media in the model representing the public agency and its goals, programs and publics (Figure 6.3., p. 200)

The Agency and Its Publics[22]

Public agencies are associated with diverse publics: The larger social setting in which it operates; the population or portion of the population it serves, communicates to, or is in contact with, or from which it may draw potential members; other organizations, public and private, and individuals with whom the public agency cooperates, competes or enters into some exchange relationships. Generally there are two types of publics: The public-in-contact and the public served.[23] Publics-in-contact include those with whom or on whom the public agency's personnel work, and therefore represent a more general category than the publics

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[21]Paul H. Appleby, Big Democracy (New York: Alfred Knopf, 1945), p. 7.

[22]The discussion in this section is derived primarily from Peter M. Blau and W. Richard Scott, op. cit., particularly Chapter 3 "The Organization and Its Publics," pp. 59-86.

[23]Ibid., p. 59.

served. (See Figure 1.5 in Chapter I and Figures 6.2 and 6.3 in this Chapter). For example, recipients of social welfare assistance, state university or college students, veterans' hospital patients, legal aid clients represent both publics served and publics-in-contact. However, the publics-in-contact of certain public agencies may in fact represent some threat or danger to society or the community: Criminals and other non-habitual law violators, prisoners, enemy soldiers, and other disreputable elements such as delinquents, sociopaths and psycopaths.[24]

A public agency can have several publics-in-contact: Its internal structure often reflects the basic divisions representing these publics-in-contact. Usually, among others, a public agency will have a technical component involved with the "product" or fundamental service function of the agency, an administrative component coordinating the efforts of the various components of the organization and mediating between them, a record-keeping component, a planning component, a public relations component. Even if these components may not be identifiable in terms of separate personnel, their functioning brings them in contact with, and therefore reflects the division of these publics-in-contact. Some of an agency's internal organizational conflicts that develop between departments result from their

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[24] Ibid.

orientation to different publics.[25]

The level on which a public agency's personnel deal with its publics-in-contact varies from situation to situation. In passing legislation, for instance, top-level leaders from the executive branch negotiate with legislative leaders, whereas in prisons, contact is made on the bottom level between guards and inmates. The selection of an agency's representatives expected to work with or on a given public is determined by the status and power of that public -- the higher the status and power of the public they are expected to deal with, the smaller the number of an agency's representatives (compared to the entire agency). These fewer representatives also tend to hold relatively higher status positions or enjoy greater prestige in the organizational hierarchy.

The publics served and publics-in-contact of an agency may also be classified in terms of their value-orientations -- "cosmopolitans" or "locals",[26] "professionals" or "bureaucrats";[27] or by client characteristics -- "lower-class",

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[25] Ibid., p. 60.

[26] These terms were first used by Robert K. Merton to describe two different types of "influentials" in local communities. See his Social Theory and Social Structure (rev. and enlarged ed.; Glencoe, Ill.: Free Press, 1957) pp. 387-420. The terms were adopted from Carl C. Zimmerman, The Changing Community (New York: Harper and Brothers, 1938), pp. 8 ff., who used them as translations of Tönnies' distinction between Gemeinschaft and Gesellschaft.

[27] Blau and Scott, op. cit., pp. 60-63.

"upper-class", "middle-class", or whether they are organized or unorganized; or by location in the community power structure -- "key influentials", "top influentials", "community power complex", "institutionalized power structure of the community", and the "institutional power structure of society."[28]

Janowitz and his associates made a study of public attitudes[29] toward government agencies, which can provide insights, but is no substitute for specific public agency studies that have to be done as part of the agency's operations. In the Janowitz study, furthermore, they had only a sample of 764 adults and the respondents were all drawn from the Detroit area area and interviewed in 1954.[30] Also, they were questioned about a variety of federal, state and local agencies that have contact with a wide public. The study sought to answer four questions:

(1) What was the amount of the public's knowledge concerning government operations?

(2) What was the "worth" of these services to the people?

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[28]Delbert C. Miller and William H. Form, Industry, Labor and Community (New York: Harper and Company, 1960), pp. 437-438.

[29]Morris Janowitz et al., Public Administration and the Public (Ann Arbor: Institute of Public Administration, 1958).

[30]Ibid., pp. 15-27.

(3) Was there morality in public administration?

(4) What prestige do public officials have?

The findings indicate the general problems that public agencies have to face, although each agency could do well in pinpointing its specific clientele and their attitudes, in order to orient some of their public relations activities to reinforce favorable ones and do away with, or at least minimize, unfavorable ones. This is, very clearly, a general public relations function. Specific findings can spell out the more specific problem areas.[31]

More specifically, the Janowitz study clearly points out a limited knowledge on the part of the public concerning government organizations and their operations. This knowledge on the level of specific agencies was even more limited, particularly among those who had no actual contact with the agency in question, or specific segments of the public such as persons of low socio-economic status, blacks and women. This kind of knowledge can be useful in planning information campaigns, to focus or to diffuse appeals to reach target audiences.

The Janowitz study also found out that while a majority of the respondents felt that the government was serving the public interest well, a 41 per cent minority believed the government took more from the people in taxes than it returned

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[31] Ibid., pp. 29-71.

in services to them. Again, this suggests the substance of the information campaigns public agencies may have to sustain. And an analysis by or for a specific public agency of which segments of its public(s) feel this dissatisfaction would identify the target audiences for agency's media efforts.

On the third question of morality in public administration: While only 13 per cent of the respondents believed that many government officials were corrupt, two-thirds of the sample believed "political pull influenced the decisions of public officials." This general lack of confidence in public agency officials' abilities to extend impartial treatment to its clients definitely calls for a more favorable public relations image. As in the other areas, this finding suggests the substance for the information campaign as well as the seriousness of the problem. Likewise, an analysis, by or for a specific public agency, of which segments of its public(s) feel this lack of confidence would identify the target audiences for agency's media efforts.

On the last question, Janowitz and his associates discovered a considerable increase in status of public officials in the last generation by using for comparisons White's study conducted in the twenties.[32] Janowitz, as did White, also found that high prestige was accorded public employees by those who came from the lower strata of the

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[32]Leonard D. White, The Prestige Value of Public Employment (Chicago: The University of Chicago Press, 1929).

social structure, possibly because the job security appears particularly attractive to those whose jobs are characteristically insecure. And interestingly enough, public agency employees and their relatives tended to accord lower prestige to public employment than did others. This suggests that the public relations image campaigns could very well start out within the agencies themselves!

Specific agency studies are however necessary to answer these questions for specific public agencies, as attitudes differ toward various types of agencies and toward specific agencies. Sample studies are those by Borash,[33] the National Opinion Research Center,[34] Polansky,[35] White,[36] Goffman,[37] Sykes and Messinger,[38] Caudill,[39] Coleman,[40] Almond and Lasswell,[41] and others.

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[33]Saul Borash et al., "Conceptions of Social Agencies, Community Resources and The Problems of a Depressed Community," unpublished M.A. Thesis (Chicago: Department of Sociology, University of Chicago, 1952).

[34]National Opinion Research Center, "Jobs and Occupations" in Reinhard Bendix and Seymour M. Lipset, (eds.), Class, Status and Power (Glencoe, Ill.: The Free Press, 1953).

[35]Norman Polansky et al., "Social Workers in Society," Social Work Journal, Vol. 34 (1953), pp. 74-80.

[36]R. Clyde White, "Prestige of Social Work and the Social Worker," Social Work Journal, Vol. 36 (1955), pp. 20-35.

[37]Erving Goffman, "Characteristics of Total Institutions," Walter Reed Army Institute of Research, Symposium of Preventive and Social Psychiatry (Washington, D.C.: U.S. Government Printing Office, 1957), pp. 40-48.

The Issue of Citizen Participation

Maximizing citizen participation need not necessarily mean simply increasing the numbers of citizens involved in all of the goal-identification or goal-formulation processes. This can even be too wasteful and ineffective, particularly where efforts or coverage are duplicated unnecessarily. The idea of maximizing citizen participation assumes that broadening the base of information sources increases the chances and likelihood that goals important to the group are adequately identified. This is to say that by increasing the numbers of people involved, more people are thus given the opportunity to be heard where they may not, if the numbers were restricted. However, size is no guarantee that new ideas for goals will always be proffered. And unless the number of citizens contemplated is very small, total participation to

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[38]Gresham M. Sykes and Sheldon L. Messinger, "The Inmate Social System," in Richard A. Cloward et al., Theoretical Studies in Social Organization of the Prison (New York: Social Science Research Council, 1960 [Pamphlet No. 15], pp. 5-19; and Gresham M. Sykes, The Society of Captives (Princeton: Princeton University Press, 1958).

[39]William Caudill et al., "Social Structure and Interaction Processes on a Psychiatric Ward," American Journal of Orthopsychiatry, Vol. 22 (1952), pp. 314-334.

[40]James S. Coleman, "The Adolescent Subculture and Academic Achievement," American Journal of Sociology, Vol. 65 (1960), pp. 330-349.

[41]Gabriel Almond and Harold D. Lasswell, "Aggressive Behavior by Clients Toward Public Relief Administrators," American Political Science Review, Vol. 28 (1934), pp. 643-655.

insure that all points of views can be heard, is both impractical and unnecessary.

What is necessary then, is some mechanism by which can be guaranteed a public hearing of whatever new or different (and even opposing) ideas or goals. It need not mean that the totality of citizens be involved physically, for this is impossible and unrealistic for all except very small, local, public agencies. The numbers in the publics served and publics-in-contact of most public agencies are simply staggering to be cavalierly considered in this fashion. The optimum interpretation of "maximum citizen participation" can only be that of a representative system where all may be given the opportunity to be heard if they feel so moved or if they with to.

It also means that perhaps, while total participation is impossible on <u>all</u> levels or stages of the goal-identification process, the commitment to democracy demands some form of consultation, at least in some ultimate sense, either in approval of goals already identified, or in the selection of those who are to identify these goals, or both. In the former case, political considerations may dictate the necessity of organized efforts to validate the formulation of certain goals and the defeat of certain others -- thus opening the question of "railroading" of the majority's views or those of a strong, organized interest group or the suppression of the views of some minority groups or those

of even larger segments of the public that are not as organized or motivated as the interest groups.

"Write-in" provisions, as in candidacy situations can at least alleviate the tendency to polarize consultations into opposing camps around various interest groups or factions of the public. More importantly, the function and composition of those selected to identify goals for public agencies can be the main factor in deciding how such "write-in" statements are to be handled. The problems faced by those selected to identify goals for public agencies and the demands on them as indicated almost preclude partisan composition by it or what may initially seem as the economical employment of representatives who are already elected to do the task of "representing" their constituencies.

The utility of the Gini Index or its derivative Efficiency Index can be once more indicated at this point, to insure representativeness of the selection. The use of either Index, in requiring proportional representation, insures maximizing representation, and by it, increases nominal citizen participation. The modes of real citizen participation include technical research on what people want, opinion polls and attitude surveys of the populace, or its community leaders, advocacy planning by professionals, and full-scale citizen's goals campaigns as in the Dallas and Los Angeles experiences. Citizens councils, community

action councils, or advisory groups are usually organized to consist of community leaders representing a cross-section of citizenry or public concerned. Typically then, they tend to be dominated by business, social, religious and governmental leaders, with a sprinkling of housewives, unskilled workers and members of underprivileged groups often only as "token representatives."

According to Sigel, citizen advisory committees lack the imagination to redefine general goals into specific technical objectives and blueprints, and therefore usually agreed with professionals who determined goals.[42] Moreover, she asserted that citizen advisory committees had three primarily negative aspects:

(1) They are usually very slow in coming to any conclusions and even when conclusions are reached, they generally encompass administrative goals such as better government, police protection, schools, fewer taxes, etc.

(2) Discussions and conclusions are mostly dependent on the presentations of professionals, resulting in a failure to generate new ideas on needs, problems or solutions.

(3) The citizen-members tend only to respond to

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[42]Roberta S. Sigel, "Citizen Advisory Committees," Nation's Cities, Vol. 6, No. 5 (May, 1968), pp. 15-21.

the "experts"[43] resulting in a minimum of controversy or opposition in discussion.[44]

This lack of controversy or opposition often stems from lack of knowledge, although very often the noncontroversial subject-matter generated apparent consensus. Also, the lack of time and interest of the participants -- caused by such lack of information, or holding meetings after working hours, contribute to this lack of conflict. Furthermore, committees tend to be dominated by special technical advisors, since the lay participants lacked skills to counter arguments of the "experts." The membership also tend to feel only a limited stake in committee activity when goal discussions become too abstract or appear unrelated to them personally.

Lindblom avers that "it is difficult for people to sense what they haven't experienced and it is even more difficult to sense what doesn't even exist."[45] He asserts that most people are not logical in analyzing alternatives for achieving goals, but rather, that "they accept what satisfies them, not trying to reach a theoretical best."[46] His pes-

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[43]For example, leading bankers or real estate brokers became considered "experts" in urban economics.

[44]Sigel, loc. cit.

[45]C. E. Lindblom, "Pitfalls of Public Consultation," Planning (American Society of Planning Officials, 1965), p. 140.

[46]Ibid., p. 102.

simism mirrors that of Altschuler and finally culminates in his statement that:

> You can't expect citizens to think about and choose ultimate goals — rather give them problems and issues — so that the policy maker and planner can find acceptable alternatives from public discussions. The case is the same for public officials who work in problem areas .... and since people don't know all the conditions of their choices, the first step must be education for discarding old ideas.[47]

The San Francisco Community Renewal Program included a citizens advisory group and an analysis of this group revealed that:

> There was an overall tendency to agree with the "classic" goals of urban renewal .... indicating great difficulty for both the laymen and the professional planners of thinking through complex and sometimes conflicting goals.[48]

The heterogeneity of the composition of most publics also result in a variety of perceptions of needs, beliefs and values. Even in communities "where interests and norms are rooted in a class-based style of life -- the attempt to elicit the commitment of the entire community to a specific goal will likely threaten another group and elicit opposition."[49] This variety and lack of homogeneity tends to promote more problems in maximizing citizen participation, even only on the level of goal-formulation, let alone,

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[47] Ibid., p. 142.

[48] Arthur D. Little, ed., Community Renewal Programming: A San Francisco Case Study (New York: McGraw-Hill Book Company, 1967), p. 227.

[49] Sam Bass Warner, Jr. (ed.) Planning for a Nation of Cities (Cambridge, Mass.: M.I.T. Press, 1966), p. 49.

policy-implementation.

On the other hand, a number of advantages are afforded by citizen participation and citizen-orientation in the goal-formulation process. Davis lists the following as advantages:

1. Opportunity for utilizing constructively educated dissent to the planning program versus opposition to the program which cannot be utilized constructively.

2. Direction to the planners in the development of the planning program.

3. Clearly enunciated goals for all to use (public and private agencies, institutions, and individuals).

4. Opportunity for the planner to give consideration to the many interests of the community when formulating goals.

5. A basis for selection between alternative courses of action, thus projecting into the public arena the areas needing compromise and general negotiation.

6. Assistance to the planners and citizenry in distinguishing between the goals of the planning program and the means proposed to implement the plan (selection of alternative plans,) contributing to a clearer definition of goals, objectives, and policies.

7. A means for general agreement on objectives and policies among the special interests of the community.

8. The opportunity for increased public interest in the understanding of the planning program.

9. The environment for generating and sustaining support in implementation of the planning programs.

10. A continuing communications link between the

planners and the citizens, giving the citizen a sense of contribution to the program.

11. Inspiration for planners and citizens by setting goals and producing achievements that enable the citizens and planners to see benefits to be derived from the planning program.[50]

According to Anderson,[51] "The essence of political democracy is not a particular form or structure of governing"[52] but is rather "an attitude of mind and a social system in which freedom and justice encourage man to seek his personal fulfillment."[53]

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[50]Davis, op. cit., pp. 161-163.

[51]Richard C. Anderson, Management Practices (New York: McGraw-Hill Book Company, Inc., 1960).

[52]Ibid., p. 6.

[53]Ibid.

CHAPTER VII

CONCLUSION

Special Problems of Public Agency Administrators: Comparisons With Private Managers

As functioning systems, public agencies may be seen as faced with the same problem of survival all organizations must contend with. This main problem may be broken down in terms of the more specific problems of goal attainment, adaptation, stabilazation, tension-management and boundary maintenance.[1] Thus, the areas of leadership and decision-making, communication lags and obstacles, and the general area of innovations and organizational change, turn out to be the problem areas that frequently concern the administrator, whether of public or private concerns.

However, to the public agency administrator, these problem areas take on added complications that private administrators never really have to consider endogenous to their organizations. First is obviously the institutional

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[1]Talcott Parsons et al., Working Papers in the Theory of Action (Glencoe, Ill.: The Free Press, 1953), pp. 183-186. Cf. Parsons, Structure and Process in Modern Societies (Glencoe, Ill.: The Free Press, 1960), pp. 17-97.

structure in which he is to operate: The political demands and restrictions on his ability to make decisions are often constraints few private administrators have comparable to them. Secondly, there is the ideological orientation, that is also tied up with the political institutional context, within which the public administrator is expected to fulfill his tasks.

Power is a type of influence, but is not identical with it. It is modified by values, norms, and standards accepted by interacting individuals or organizations. Particularly in an administrative context within a political democracy, the term "power" elicits more negative and hostile reactions than positive reactions, since power often implies some type of conflict or friction.[2] Most Americans distrust the term "power" or even its legitimate derivative, "authority," and most undoubtedly use the more polite, but rather misleading term, "influence." Power in American administrative circles then tends to mean an ability to have someone else do something, not so much focusing on the possibility of resistance.

The exception to this conflict aspect in the concepts of "power" or "authority" occurs where the leader exercises power or authority as a result of his charismatic image.

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[2]Cf. Max Weber's definition of power as the "probability that one actor within a social relationship will be in a position to carry out his own will despite resistance," in Weber, op. cit., p. 152.

Whether certain characteristics or traits may be granted as inherent in the leader, or only that his followers impute such characteristics to him, will not make any difference. However, it is not often that the public agency administrator is imbued with this "halo" which the public ascribes to whoever happens to please its fancy.

Recognition as a leader sounds redundant as a definition of leadership, yet it contains an important element in the ascription of leadership. Since leadership is a status, it requires at least two terms, not only one to claim it, but at least another one to honor the claim. To a leader, therefore, whether he becomes one because of his endownemt, or because of what his followers ascribe to him, accrues charismatic authority. Authority, as a form of legitimate power, is often based on one or a combination of the following:

1. tradition,
2. institutionalization, and
3. charisma.[3]

Thus there are three basic types of leaders:

1. traditional leaders,
2. legal or institutional leaders, and
3. charismatic leaders.

While certainly some leaders may actually have their authority

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[3]Ibid., pp. 324-326.

based on more than one of these sources, very often the public agency administrator's leadership can only be legitimately based on the institutionalized norms. In his role as a decision-maker, or a participant in the decision-making apparatus of the administration, he can only rely more upon influence, unless he is willing to insist on whatever legal leadership prerogatives may be attendant to his position.

The usual danger facing someone whose position is solely based on power is the possibility of revolt. The power structure as institutionalized within public agencies however are the best hedges the public agency administrator has in allaying his fears concerning the vulnerability of his position. These structures[4] include the chain of command, the unity of command, line and staff distinctions and the notion that "authority flows from the top," which often is also responsible for the activity known as "passing the buck." The public agency administrator finds little solace in the "management rights" doctrine that is at least open to private administrators whose authority is based on rights of ownership. The public agency administrator, on the other hand, occupies an ambivalent position in that he has both status as well as an image ("servant of the people") to live up to. This not only makes it difficult, if not altogether

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[4]Cf. Leonard D. White, Introduction to the Study of Public Administration (New York: The Macmillan Company, 1955), particularly Chapter 3, "Some General Aspects of Organization," pp. 26-43.

impossible, to regulate the access to him by any rationale other than that which public policy has already decreed for him. The denotation of the word "servant" likewise can have unfortunate consequences, which often can be trying even to the most patient man, when members of the publics served or publics-in-contact expect him to be servile and fawning.[5]

The ambivalence is furthermore heightened by the professional orientation that most public agency administrators are expected to have. As differentiated from mere bureaucratic orientation, the professional public agency administrator is bound to be more "cosmopolitan" in his outlook, and therefore would tend to antagonize or come into conflict with "locals", both within the organization, as well as the publics served or the publics-in-contact.[6]

Except for the public agency administrators at the very top of the functional hierarchies, very little non-routine decision-making can be said to be the function of the average public agency administrator. Of course, the distinctions between levels of decisions would make this true for all types of management or administration. However, the very insignificant decisions are often not counted as tasks of management, as they often involve only routine decisions that

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[5]See Felix A. Nigro, Modern Public Administration (New York: Harper & Row, Publishers, 1965), particularly Chapters 21 and 22 on "The Problem of Administrative Power" and "Enforcing Administrative Responsibility," pp. 445-480.

[6]Blau and Scott, op. cit., pp. 60-74.

can be more efficiently handled by a computer or more economically by clerical help. But then again, ideology plays an important role in the public agency's image of the decision-making processes, even if not in the real processes of decision-making.[7]

The distinction between the so-called democratic modes of leadership as being either consultative or permissive, seems to be more of a consolation, or at least a concession to the human relations approach to management. Again, the spectre of power apparently being unacceptable requires resorting to such terms as "influence," "permissive leadership," "consultative leadership" and the like. The definition of the situation concept[8a] comes in handy: As long as people believe they participate (or even that they should, and in what manner) in the decision-making process, and that they are happy or satisfied by such arrangements, it would be sufficient for the organization's purposes. The myths a public agency can maintain are only limited by the leaders (the genuine leaders, in this case) and their imagination, as well as the rigor and scope of the agency's

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[7]See Ira Sharkansky, op. cit., particularly Chapter 8, "Executives, Legislators and Administrators," pp. 200-234; and Joseph A. Schlesinger, "The Politics of the Executive," in Herbert Jacob and Kenneth N. Vines, eds., Politics in the American States (Boston: Little, Brown & Company, 1965), pp. 207-238.

[8a]The definition of situation concept was first discussed by W. I. Thomas and Florian Znaniecki in their The Polish Peasant in Europe and America (University of Chicago, 1918).

socialization process.[8b]

More authoritarian leaderships have often been similarly based and justified by the myths incorporated in or generated by other political systems. Viewed in the context of the society's express or implicit objectives, the rationale for power and its exercise are often accepted without much question.[9]

In a system where the legislature keeps a tight rein over the finances of the public agency administrator, no real decision can be made other than the routinary decisions that can be performed within the relatively broad limits set by the higher policy-making bodies or by the relevant legislative bodies. A public agency administrator then, unless he is occupying a relatively top position in the administrative hierarchy, has really very little decision-making powers comparable to that of a private administrator on a similar status-position in his own management hierarchy. And as a peculiar result of ideology and congressional oversight or control, whatever leadership a public agency administrator has, is often greater in the informal

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[8b]See Joseph A. Litterer, The Analysis of Organizations (New York: John Wiley & Sons, Inc., 1965), particularly Chapter 19, "Organization Style: Decentralization," pp. 378-393.

[9]See Emmette S. Redford, Democracy in the Administrative State (New York: Oxford University Press, 1969), particularly the first two chapters, "Democratic Morality, Public Policy, and the Political Systems," pp. 3-37, and "Reflections on the Administrative State," pp. 38-69.

area than in the formal dimension of the organization, again, in comparison to his private counterpart.

Much has already been written about the communication networks of organizations, particularly in bureaucracies, that to talk about the dysfunctional aspects of public agency communication patterns would not be saying anything significantly new. Unquestionably observable in industry are patterns of communication being "filtered" up the line, or that "good" information is selected and speeded up the line while "bad" information is either delayed or distorted up the line.[10] These similar prospects are often greatly increased in the public agencies and, naturally, can have disastrous results for coordination, planning and evaluation processes of any public agency. As communication presumably precedes policy-making, decision-makers depend not only upon sources of information but also upon the nature of the information received. Validity and reliability are often difficult to attain to a degree comparable with that which can be attained for credibility. Very often, in much the same way leadership and decision-making activities are distorted or weakened by the institutional politics or by ideological commitments and their implications, communication lags occur and obstacles placed in the decision-making sequence that can

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[10] B. B. Gardner and D. G. Moore, Human Relations in Industry (rev. ed.; Chicago: Richard D. Irwin, 1950), pp. 33-65.

try even the most conscientious public agency administrators.

The problem of introducing and facilitating innovations seem to present the most hazardous challenge to the public agency administrator, particularly those engaged in the planning function.[11] Again, the public agency planner or administrator does not always have the solace nor the devices that are open to his private counterpart. Political institutions, as well as politically active elements in the publics served or the publics-in-contact, often tend to be relatively conservative in their values and orientation, so that innovations are often viewed with suspicion. And the threat these innovations, or even only the attempts at innovations, offer, can be the dysfunctional element that can cost a well-meaning planner or administrator his job. It is not even important that this threat be real, since an imagined threat can have the same deadly effect if believed by individuals who are in a position to "retaliate".

Defense mechanisms can operate not only as added barriers to communication, but very often also present insurmountable barriers to introducing changes. Particularly where the public agency planner or administrator occupies merely a "staff" rather than a "line" position, he is more

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[11] See Appendix D for a diagnostic model for identifying and measuring psychological and social effects of introducing innovation. The model was constructed to facilitate the identification of problem areas that would determine the success or failure of the goal-attainment processes of the agency.

vulnerable to the traditional staff-line conflicts.[12] This complicates the matter of introducing innovations to hardened "line" officers who tend to believe strongly that all they need to know they have learned from experience, and no amount of book-learning of a "young upstart" can ever equal it.[13] Superior knowledge, even when realized by others is not often officially recognized, and no doubt only adds to the public agency planner or administrator's rankling disappointments.

Generally, people resist changes when the marginal utility of the effects of such changes are perceived to be less than the marginal disutility brought about by the loss of status in their organizations. In other cases, the marginal utility of change effects may actually represent a net loss. However, in the public sector, because of the vague and ambiguous ideological commitments that are often not reducible to quantifiable or even only operational measures, it is easy to understand why people can often resist merely because there seems to be no great reason they can see for

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[12]Staff-line conflicts in industry have been rather thoroughly discussed by Melville Dalton in "Conflicts Between Staff and Line Managerial Officers," American Sociological Review (June, 1950), pp. 342-351.

[13]See the rather strong words of Harrington Emerson in "The Twelve Principles of Efficiency," The Engineering Magazine (New York, 1912), pp. 410-411: "Each separate staff man is regarded as an invading enemy by each and every line head, and all lines will combine against all the staff. Even if many of the men are amiable, sensible, patient, conditions leading to discord and trouble are constant."

the change. The activity required of the public agency planner or administrator can also appear contradictory to the self-concept the agency administrators have of themselves, or to their training, or their standards of work, as well as to the public at large. In this case, even public agency planners or administrators themselves, may not be convinced of the advisability of change.

The general guidelines for the planner or administrator to get people to go along with organizational innovations often require a long or continuing socialization process. In public agencies of a democratic persuasion particularly, they would involve:

1. drawing the attention of the people[14] to particular problems to be solved;

2. soliciting of suggestions for solutions, to elicit participation, or at least a sense of participation by the people;

3. keeping the people involved informed of all the changes, to sustain their interest by strengthening their self-conception of involvement;

4. eliciting changes in the self-images of the people involved in order to conform to requirements for or by the proposed change(s);

5. advancing communication as much as possible since there is often the sabotaging effects of delayed communication in raising suspicions as to motivations underlying the proposed change(s);

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[14]"People" here can mean personnel in the public agency in which changes are contemplated, or personnel in other agencies a planning staff may be recommending innovations for or even the publics served, the publics-in-contact, or the public at large.

6. positive identification of sanctions to be applied in the event of noncompliance; and

7. advance training and orientation to such change(s) to come.

Again, even in terms of these general suggestions, the public agency planner or administrator is again relatively handicapped as compared to his private counterpart. For one thing, while his problems with respect to innovations within the organization itself, assuming he has authority to initiate these, could be comparable to that of the private planner or administrator; he is also often saddled with the extra task of dealing with publics which are much more powerful than those dealt with by private enterprise. Somehow, the monopoly status the public agencies enjoy do not seem to be as much guarantee against the invidious effects of the institutional structure and the ideological "myths".

Administrative Philosophy for Public Agencies in Democratic Settings

Sound administration requires a sense of direction: a knowledge of, as well as a feeling for, the agency's goals. The degree to which these goals can be clearly formulated -- better yet, expressed in quantifiable terms -- if they are not yet so articulated, shapes the administrative philosophy that supplies the basis for solutions to agency problems. As a basis for solutions, administrative philosophy represents "a body of knowledge that supplies a logic for effective

thinking for the solution of certain kinds of problems."[15] It determines the manner in which agency personnel plan and organize their activities and efforts to achieve the agency goals, as well as provides the bases for evaluating the effectiveness and efficiency of these efforts. As Anderson points out:

> This philosophy will manifest itself in many ways throughout the organization. For instance, a philosophy that encourages free and easy relationships will make possible a greater "span of control" and fewer levels of command, thus permitting economies in staffing.[16]

The twin commitments to democratic values and to measurable effectiveness create special stresses and strains on public administrators that most private entrepreneurs can more readily resolve. However, the potential confusion resulting from these conflicting commitments can be minimized or even avoided by recognizing that the two sets of values are not exactly diametrically opposed, that they are not mutually exclusive. The attempt to build a consistent system in which the proper "mix" for these sets of commitments are the proper domain of research and planning agencies: Whether for themselves, or for the larger agencies of which they are a part.

A philosophy need not be a fully articulated document.

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[15]Ralph C. Davis, "A Philosophy of Management," Advanced Management (April, 1959), p. 5.

[16]Anderson, op. cit., p. 6.

However, for our purposes, its delineation is a necessary step in understanding the management process in any public agency. Since it is most often the case that such a philosophy is not overtly manifested, it becomes necessary to deduce its nature, not only from political, legal and organizational tasks legitimately established for it, but also from the institutional setting in which the public agency operates. Unfortunately, the actual activities and efforts of the agency and its personnel may only reveal a misconception of this philosophy or even a direct contradiction of this philosophy. In this case, the actual and the ideal basis for solutions of organizational problems do not coincide, or may even be at cross-purposes. Therefore, evaluations made on the basis of each are likely to produce divergent and often inconsistent results. Clearly, this cannot be very efficient.

Consistency in ideal and operating philosophies is important particularly where someone else outside the agency is vested with the function of evaluating a public agency's activities and effectiveness. It would be disastrous, not only for the public agency itself, but also for the larger portion of society dependent on that agency's correct functioning, if the bases for evaluation are not identical to the bases for organizing and directing agency efforts and activities. It is also a clear waste of taxpayers' money when public agencies operate under conditions that are pro-

ductive of irrelevant or unnecessary work. This is more likely to happen when its goals and functions are not clearly and exclusively delineated.

The delineation of a public agency's goals, therefore, is necessary for the purpose of the agency's survival, if it depends on the evaluation of someone else outside of it, such as the legislature. It also becomes necessary when a commitment is made to rational procedures that assume a concommitant commitment to avoid, or at least minimize, waste. This, however, is not sufficient to establish a management philosophy for a public agency, although it is an important, necessary step. The doctrine of political democracy will have to be examined and its implications for managing the public agency's activities and enterprises will have to be brought to the consciousness of the agency administrators. Particularly in agencies vested with planning or coordinative functions of government, the tendency to overlook these important values can lead to overemphasizing economy and efficiency without realizing that economy and efficiency are only secondary considerations that make sense only if effectiveness is secured or some degree of it is achieved. What sense is there in an agency's economical and efficient operations, if it does not do what it is supposed to do in the first place?

Democratic management is not necessarily antithetical to the concept of responsible leadership. It should not be

confused with anarchy or a total absence of authority, for this would do violence to the principle of responsibility in a democracy. Democratic management represents a style of supervision which denies the myth of executive omniscience and omnipotence. It stresses the full development and utilization of capacities and talents of individual personnel in the public agency, rather than the autocratic domination of most by a few. The democratic planning administrator not only helps develop his personnel's capacities, but also makes it more likely to discover new or more creative solutions to agency problems. He does this by eliciting relevant and thoughtful judgments or points of view, and avoiding and discouraging the flagrant use of authority or status alone to induce favorable evaluations or behavior.

Anderson identifies four important effects of what he calls "the democratic atmosphere":

> (1) Facilitating easy association which furthers understanding among all members;
>
> (2) Reducing conflict between ethical or political concepts of equality enjoyed in the democratic community on the one hand and a stratified hierarchy of autocratic ... [agency] organization on the other;
>
> (3) Recognition that since all members benefit from ... [the agency] success, they share responsibilities for seeing that the enterprise function properly, which, in turn, helps to cement sound human relationships; and
>
> (4) Permits the natural leader, the one who wins

> and deserves the respect and loyalty of his associates, to rise to a leadership position.[17]

Effective management, when democratic, can yield an optimum condition where the usual organizational barriers to free communication are removed. The dysfunctional "filtering" of information frequently encountered in private business or industrial enterprises, where "bad news travels slowly up the management line"[18] can only be minimized if such "filtering" or delay in transmission of information is recognized as serious, and a premium is placed more on the corrective mechanism to minimize loss or waste, than on the punitive mechanism to penalize mistakes or error. This can be more readily done in public, rather then in private, agencies, where security of tenure makes it more meaningful, and not only possible, to consider the possibilities of installing error-correcting, servo-mechanisms or systems.

Correcting mechanisms are certainly much more important for planning agencies on state, regional or national levels, since mistakes and errors on these levels can cumulate to disastrous proportions. If agency personnel are less likely to feel threatened by accepting and calling attention to errors and mistakes made, the dysfunctional problems of "filtered" communication up the line can be minimized, if not

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[17]Anderson, op. cit., p. 8.

[18]Cf. B. B. Gardner and D. G. Moore, "The Line of Authority and Communication," Human Relations in Industry (rev. ed.; Chigago: Richard D. Irwin, 1950), pp. 33-65.

totally avoided. This, however, requires an atmosphere of mutual trust or at least an absence of suspicion that mistakes will be penalized heavily or will lead to effects detrimental to the individual's welfare. Moreover, this ideal situation would provide the individual with opportunities to develop and utilize his capabilities, to participate in the decision-making processes affecting his work and welfare, and to receive just recognition for his legitimate organizational activities. But while it implies some degree of participation and consultation, it need not mean that all agency decisions are to be submitted to a majority vote. Collaboration and the extent to which the agency personnel can participate or be consulted by management, will depend on the organizational level of the decision and the nature of the organizational enterprise in question. In no case are these collaborative efforts to be viewed as replacing administrative responsibility.

While success for the leadership in a public agency requires cooperation and support from agency personnel, among others, tenure in leadership positions cannot depend on mere popularity. Decision-making is a fairly complex and technical process for which special preparation and training are necessary. Popularity offers no guarantee that these special requisites will be available in a popular figure. However, if organizational communication is to occur spontaneously and naturally -- i.e., without the devices that

only stimulate an artificial, and often wasteful, exchange -- then it seems that administrators should not be unpopular. Popularity then, ideally, would only be irrelevant to leadership effectiveness. In reality, however, unpopularity can be a deterrent to leadership effectiveness.

Technology and the Future Forms of Public Administration

The technological explosion that characterizes the information systems technology has grown to such proportions that it could be hazardous to offer any detailed guesses about the future forms of public administration. However, the trends can generally indicate the basic configurations, if not the details, of these future forms.

The impact of the cybernetic industries on public administration can be expected in the areas of information-gathering, coordination and control. This means that the increased demands for data-gathering and information retrieval can be projected from the future patterns of population growth and the growing requirements for rational procedures stemming from the need to conserve relatively scarce resources *vis-a-vis* a growing population with escalating expectations. The operational transformation of these expectations into articulated demands make it even imperative to institutionalize the rational patterns of decision-making.

One of the important characteristics of an efficient

and economically operating systems is that of rationality of procedure. This requirement implies the possibility of specifying to some detail the operations or procedures of some unit of work and activity to achieve effectivity, efficiency and economy in allocating scarce resources. This is the crucial assumption in planning, that the planning function can be done independently of, rather then slavishly to, tradition.

Discipline is obviously required in the desirability of minimizing the lag between the time that decisions are made and the time that they are carried out. The automaticity of translating decisions into operations or processes has its obvious analogy to military discipline as a functional prerequisite to the effective and efficient attainment of military objectives. However, more importantly, since the public agency's institutional format requires an emphasis on the positions, rather than the personalities, within the organization, discipline becomes important to the organization when some of its decision-makers may occupy more than one position in the political hierarchy. It is imperative that an agency administrator who "wears different organizational hats" suggesting different interests or commiments, be able to keep them separate and to maintain some discreteness in pursuing these different, and possibly sometimes opposing, interests or commitments. Thus, such discipline is prescribed so that those occupying different status positions in the organizational hierarchy will not want to

take advantage by consolidating or accumulating the relatively restricted power or prerogatives attendant to each of his different positions.

Maximizing these traits desirable for an effective and efficient operation of public agencies can be attempted by the introduction of automation in the system, particularly the handling of the routinary details that consume so much time. The primary contribution of cybernetic systems technology is the automaticity that speeds up relatively routine decision-making. Also, it makes possible the efficient handling of gross data, which allows decision-making to rest on more up-to-date, relevant and reliable information which would be either impossible or outrageously prohibitive in cost if done with only human effort. Presumably, automatic processing of information and routine decision-making on the intermediate levels can free some management or administrative level personnel to enable them to pursue the obviously more important policy decision-making tasks without having to maintain a crisis-orientation that is so common to American public agencies. This crisis-orientation is often the consequence of having to bear the burdens of too much routine decision-making that could be better delegated to lower level personnel or automatically made by impersonal servo-mechanisms.

These impersonal servo-mechanisms even perform an important psychological function of imparting a sense of professionalism that is associated with the application of the

technological accoutrements to the routinary decision-making operations. The impersonality of the computer also makes it possible to divorce the subjective and emotive aspects of a decision from all other rational concerns that ideally are the only bases of routine decisions.

The use of the computer, linear programming and similar planning and control techniques can be expected to further the necessity and desirability of extensive data-collection and processing beyond the usual scope now narrow by the limitations of agency resources or the lack of more sophisticated techniques and hardware of the computer technology.

The greater number and scope of tasks that public agencies will be expected to fulfill, will require a greater degree of centralization and automaticity. Decentralization objectives or advantages can even be achieved, with centralized equipment handling the main operations, by employing input/output terminals in outlying areas. This kind of computer time-sharing is even now available in the computer industry, to enable relatively smaller firms to make use of a computer if their operations do not really require a full-time computer operation, or if their budgetary restrictions prohibit having their own computer. Obviously too, it would not be economical, and perhaps not even efficient to have a local area agency maintain independent computer operations when time-sharing arrangements can be sufficient for their

purposes.

The escalation of expectations point the way to a greater role public agencies can be expected to play in their primary service functions. The "nation in crisis" view and the extreme case of the "garrison state" suggests the same, if not a greater, role to be assumed by public agencies. The organization of a welfare state demands a smoothly-running, efficient and dependable system for the gathering and processing of information as much as, or perhaps even more, than a garrison state. Whatever expectations are thus entertained in the directions of political system changes, we can look forward to greater uses of automatic features of cybernetic technology. This futuristic-orientation then establishes a functional requirement or need for rational procedures -- one that can make possible to take advantage of advances in cybernetic technology.

The survival problems that public agencies have to face may be described in terms of the following:

(1) To provide for a reward structure that will give incentives to the agency personnel in order that the main activities of the public agency will be carried out, and carried out with characteristic efficiency and economy;

(2) To maintain a system of communication that shall efficiently, effectively and economically keep channels of information open within the

public agency as well as between the agency and its publics-in-contact;

(3) To maintain a system of control and coordination to enable direction of agency activities to achieve the agency goals and objectives, execute the policies made, and generally, to perform the specific tasks of the organization;

(4) To maintain a system of security and discipline to enable staff members identify themselves from other persons, to screen prospective personnel, gather intelligence materials or information about competing agencies, or associations with which it is in conflict, and generally, to adapt to external and internal conditions that may threaten the organization and its activities;

(5) To provide for the training and upgrading of the staff, either initially when they come in, or on a continuing basis to provide for changes and innovations in the agency operations, or for promotion purposes (and even lately, for retirement purposes).

To this end, certain organizational principles or recommendations might be made.

Recommendations

First of all, a public agency's goal(s) must be stated

in fairly objective and operational terms. This should allow each unit to determine what it must contribute to the attainment of the overall objectives of the whole agency. Each unit's goals and tasks can then be explicitly stated, if possible, in quantifiable terms, so that its performance can be gauged against what it can be reasonably expected to contribute to the general goal(s) of the public agency. Quantitative goals provide automatic, objective criteria or standards of effectiveness and efficiency.

As much as possible, work performed by each person must be confined to a single function -- but if not possible, related functions should be grouped together under a common director or coordinator. One head and one plan for each group of activities having a common goal, objective or task, is recommended to insure unity of direction and coordination. Following this, a person or unit should receive orders from only one superior and in turn be accountable only to the same.

Authority and responsibility should be commensurate: If an individual or agency is to be held responsible for certain results, he or it should be given enough authority to achieve this. The public agency character however would require further that while this authority must be sufficient, it must also not be more than what is sufficient. Conversely, if an individual or an agency has the authority to take action, he or it should be willing to accept responsibility for results.

Each decision should be delegated to the lowest competent level, in order to free higher levels of administration for the more important tasks of the public agency. Activity, interaction and responsibility have to be distributed over an area in such a way as to reduce to a minimum, all kinds of costs, in adjusting to the organizational environment, or in undertaking the activities of the public agency, or in the dispatch of the routinary day-to-day activities of the agency. Activity, interaction and responsibility have to be distributed to reduce all kinds of waste of time, effort, personnel and opportunity that often results from the duplication of work brought about by poor information retrieval or flow in the public agency.

Coordination, control and authority should be medially located in the agency; i.e., the span of control must not exceed the physical limits for effective, efficient and economical review or evaluation. Coordination, control and authority have to be located to reduce all kinds of lag in the time during which policies are formulated or decisions made, and the time during which such policies or decisions are administered or executed.

Since communication means and routes affect costs and effectiveness, and hence, the location of activity, control and authority, care should be exercised in their selection, modification or replacement. Expectation as to statuses must be fairly consistent, particularly with the

goals, objectives, policies and tasks of the public agency, so as to avoid the intensification of personal interests that may obstruct or screen information in the communication network. Otherwise, this could be very productive of waste, lag or even outright ineffectiveness.

Actual, as well as potential, rewards must vary directly with the degree of effectiveness that an activity might have in attaining a specific task, or promoting policy, or contributing to the public agency's goal(s) or objective(s). Competition for these rewards will then reflect, not only their scarcity and value, but also the importance of attaining the public agency's goals.

Obviously, part of the statement of the goal(s) of a public agency should be a specification of the extent to which individuals or groups are to be benefited by the activities performed by it. The question of workability of their programs and projects can then be projected back to the original goal(s) as to "who is to benefit and to what extent?" There is no universal economic solution; but rather, there are only the technological alternatives possible within the given limitations of any condition or situation. The problem of evaluation is a matter of what best achieves the goal(s).

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APPENDIX A

DUTIES OF DIVISION OF RESEARCH AND PLANNING[1]

The Division of Research and Planning shall:

(a) maintain a continuing evaluation of existing research facilities in the State and their relationship to the economic growth of the State;

(b) prepare and disseminate information relative to research facilities in the State and their availability to business and industrial activities;

(c) prepare and recommend programs for the coordination of research activities in the State and to assure the maximum use of such facilities in the development of economic growth;

(d) have the authority to contract with other State agencies including universities and colleges within and without the State and with Federal agencies for research that, in its judgment, is best undertaken by such agencies or institutions, and apply for, accept, administer and expend grants from the Federal government and any other public or private sources for research purposes;

(e) conduct or encourage research designed to further new and more extensive uses of the natural and other

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[1]Section 14, 74 O. S. Supp., 1965.

resources of the State and designed to develop new products and industrial processes;

(f) study trends and developments in the industries of the State and analyze the reasons underlying such trends; study costs within the State; and make recommendations regarding circumstances promoting or hampering business and industrial development;

(g) generally gather, compile, and make available economic analysis and statistical information relating to business, trade, commerce, industry, transportation, communication, natural resources, population and other like subjects in this State, with authority to call upon other departments, universities and colleges of the State for statistical data and results obtained by them and to arrange and compile such economic analysis and statistical information in such manner as it deems advisable.

(h) examine the technological process by which mining, quarrying, and other extracting processes may be improved, and by which materials now uneconomical to exploit may be extracted and used commercially for the public welfare;

(i) prepare and adopt an official State plan from the long-range development plans of the various agencies, commissions and departments of State government;

(j) set standards for prequalification, prequalify and cooperate with county, multi-county, regional and other agencies and planning groups within the State for the purpose

of promoting coordination between the State and localities as to plans and development in order to maintain a high level of gainful employment in private profitable production and achieve commensurate advancement in social and cultural welfare; coordinate the activities of statewide and local planning agencies; join and participate financially with prequalified multicounty and regional planning groups in the organization and undertaking of economic planning projects; and encourage and assist in the organization and functioning of local planning agencies where none exist;

(k) advise and cooperate with municipal, county, regional and other agencies and planning groups within the State for the purpose of promoting coordination between the State and localities as to plans and development in order to maintain a high level of gainful employment in private profitable production and achieve commensurate advancement in social and cultural welfare; coordinate the activities of statewide and local planning agencies, correlate information secured from them and from State departments, and disseminate information and suggestions to such planning agencies; and encourage and assist in the organization and functioning of local planning agencies where none exist; and

(l) study such other scientific, industrial, and economic problems as in the judgment of the Commission, shall be deemed of value to the people of the State.

APPENDIX B

FUNCTIONS AND SERVICES OF THE DIVISION OF RESEARCH AND PLANNING INDUSTRIAL DEVELOPMENT AND PARK DEPARTMENT

I. Research and Planning Services

A. Reports - written responses to requests from Governor, Legislators, and other petitioners

B. Relevant Ideas - relevant to economic development of Oklahoma and state planning for capital improvements

C. Proposals for Funding (Scope of Services or Detailed Plans)

1. Design Studies (Plans for a Plan)

a. Proposal for a Plan (e.g. State Plan for Capital Improvements; e.g., Airports, Water and Sewers, etc.)

b. Proposal for an Information System (Management Controls; e.g., OTIS, API System, etc.)

2. Project Proposals

a. New Organizational Structure(s) with New Functions

b. New Organizational Structure(s) for Existing Functions

c. New Functions for Existing Organizational Structure(s)

D. Proposals for Legislation (for State and other levels of government)
   1. Amendments
   2. New Legislation

E. Public Relations Writings - summaries; explanations of reports, ideas and proposals; strategies and other general information

F. Continuous In-House Services
   1. Directory
   2. Public Information Services
   3. Industrial Development and Park Department Services
   4. Others

II. Acquiring Financing

A. Sources of Financing
   1. Federal Agencies
   2. Ozarks Regional Commission
   3. State
   4. Local (city, county or district)
   5. Private Foundations

B. Purposes
   1. Proposals from Division of Research and Planning
   2. Proposals from other State Agencies
   3. Proposals from other Groups within Oklahoma

III. Monitoring Projects - overseeing plans and projects done by others

A. Authority Established Through Control of Financing

1. Consultants
2. State Agencies
3. Universities
4. Other Groups

B. Authority Established Through Official Designation by Governor or others

C. Authority Established Through Familiarity with Project

IV. Implementations

A. Final Plans

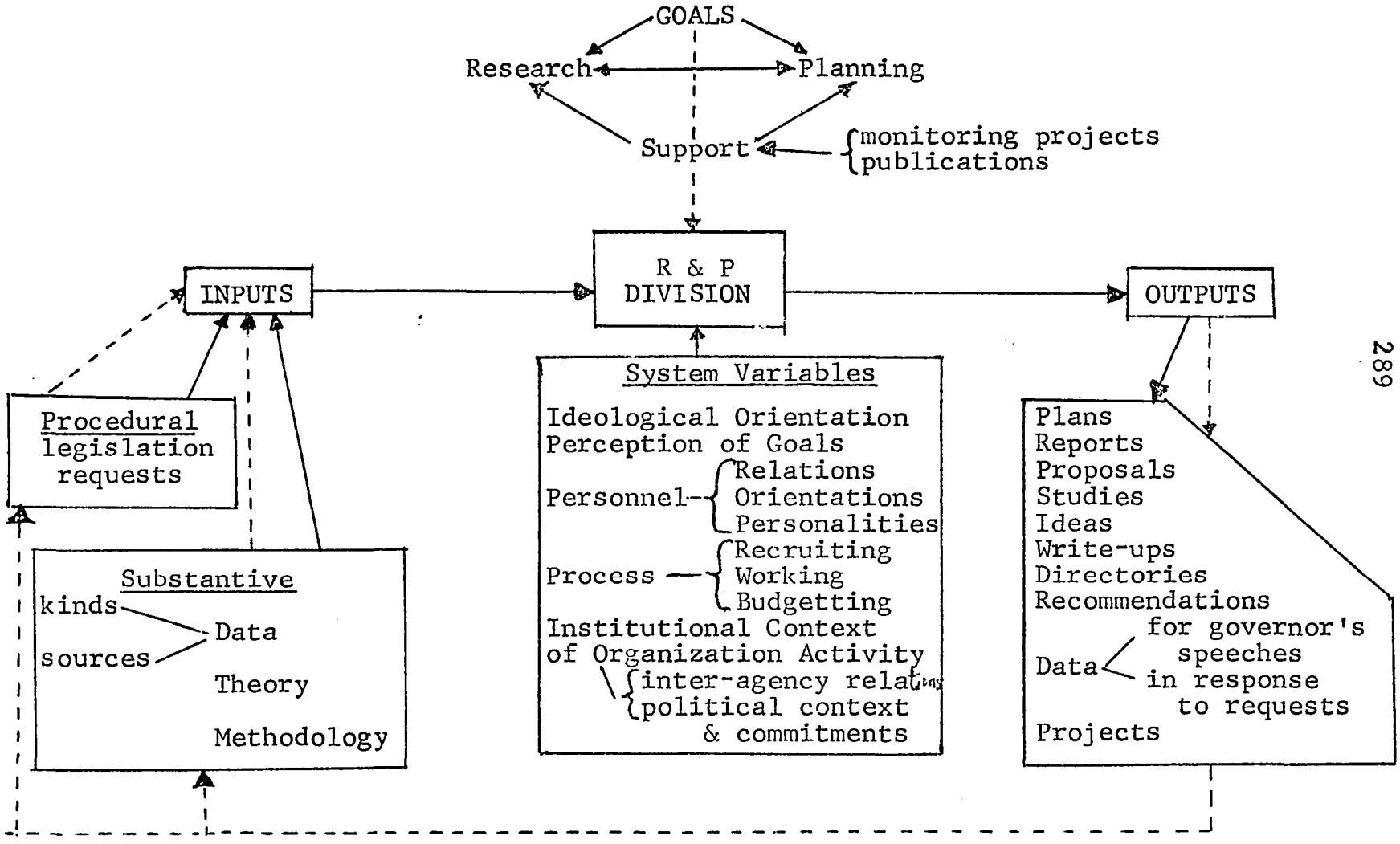
1. State Plans for Capital Improvements
2. Information Systems

B. Projects

1. New Organizational Structures
2. New Functions for Existing Organizational Structures (e.g. management controls, additional services, etc.)

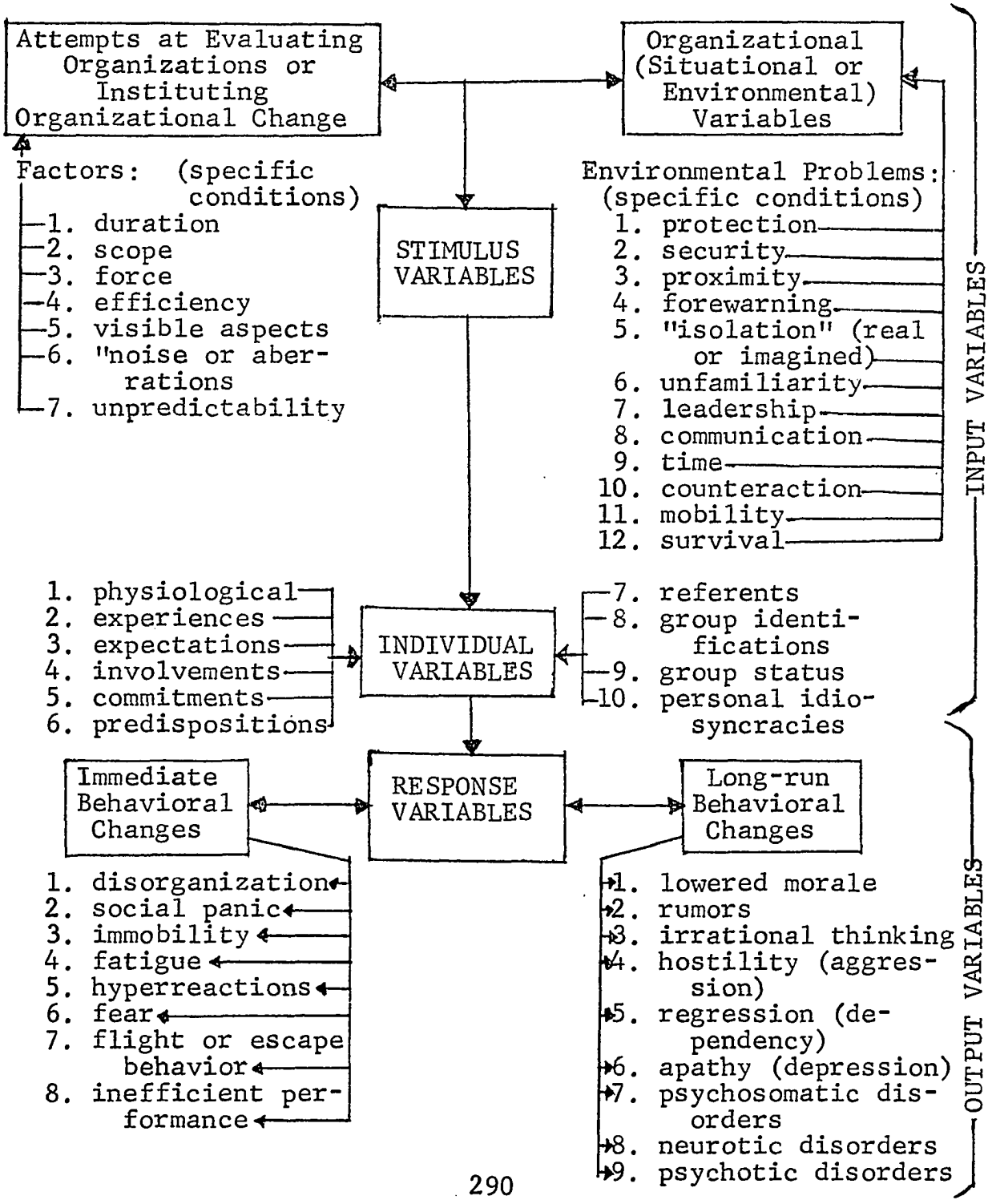
C. New Legislation

APPENDIX C THE RESEARCH AND PLANNING DIVISION AS SYSTEM



APPENDIX D

A DIAGNOSTIC MODEL FOR DETERMINING PSYCHOLOGICAL AND SOCIAL PROBLEM AREAS RESULTING FROM ATTEMPTS AT EVALUATING ORGANIZATIONS OR INSTITUTING ORGANIZATIONAL CHANGES



This model was developed for describing and hopefully measuring variables that represent causal factors and effects connected with evaluating organizational effectiveness and efficiency.

This model was adapted from a paradigm used in an O.U. Systems Research Center paper entitlied, "Prior Art in the Psychological Effect of Weapons Systems."[1] It is to be noted that the model was constructed to facilitate the identification of problem areas that would determine the success or failure of the goal-attainment processes of the agency. Obviously, another response variable set may include acceptance of the evaluation of the agency and/or its operations as well as that of the resulting organizational changes, adaptation and innovation. In these cases then, reinforcement is usually indicated, assuming such responses are relevant and necessary to attain the agency goals.

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[1]Monte Page, Clinton Goff, J. D. Palmer, Wayne Jett and L. M. Gustafson, Report 1419-1: Contract AF 08 (635)-3696; presented at the First Symposium on the Psychological Effects of Non-Nuclear Weapons, Eglin Air Force Base, Florida, April 29, 1964.

APPENDIX E

RACIAL COMPOSITION OF OKLAHOMA CITY SCHOOLS, 1968[1]

ELEMENTARY SCHOOLS	Blacks	Others	Total	% Black
Adams	1	893	894	.1
Arcadia	84	46	130	64.0
Arthur		808	808	
Belle Isle	10	331	341	2.9
Britton		471	471	
Bryan[2]	7	33	40	17.5
Buchanan		660	660	
Burbank	15	446	461	3.0
Cleveland		318	318	
Columbus		620	620	
Coolidge	2	1079	1081	.1
Creston Hills	550	2	552	99.9
Culbertson	868	4	872	99.9
Davis		376	376	
Dewey	579	36	615	94.2
Dunbar	507		507	100.0
Dunjee[3]	873	11	884	98.8
Edgemere	4	459	463	.8
Edison	390	2	392	99.5
Edwards	442	2	444	99.6
Emerson	4	219	223	1.7
Eugene Field		347	347	
Fillmore		785	785	
Foster[4]		389	389	
Garden Oaks	625	2	627	99.7

[1]Oklahoma City Public Schools Department of Research and Statistics Report, "Pupil Membership by Grade and Race," September 25, 1968, pp. 1-4.

[2]Closed in 1969.

[3]Closed in 1969.

[4]Closed in 1969.

ELEMENTARY SCHOOLS	Blacks	Others	Total	% Black
Garfield		302	302	
Gatewood		266	266	
Green Pastures	333		333	100.0
Harmony	743	4	747	99.5
Harrison		442	442	
Hawthorne		419	419	
Hayes	3	854	857	.3
Henry		152	152	
Heronville	1	444	445	.2
Hillcrest	1	1001	1002	.1
Horace Mann	2	294	296	.6
Johnson		533	533	
Kaiser		534	534	
Lafayette		324	324	
Lee	3	523	526	.5
Lincoln	769	9	778	99.9
Linwood		375	375	
Lone Star		108	108	
Longfellow	604	8	612	98.7
Madison		444	444	
Mark Twain	58	306	364	15.9
Mayfair	20	414	434	4.6
McKinley		259	259	
Monroe	1	556	557	.1
Nichols Hills		540	540	
North Highland	125	443	568	22.0
Oakridge		491	491	
Orchard Park	44	105	149	29.5
Page	387	4	391	99.0
Parmelee		483	483	
Pierce		383	383	
Polk	581	17	598	97.2
Prairie Queen	1	1250	1251	.1
Putnam Heights	8	448	456	1.7
Quail Creek		329	329	
Rancho		377	377	
Ridgeview		837	837	
Riverside	44	175	219	20.0
Rockwood	1	782	783	.1
Ross		274	274	
Sequoyah		390	390	
Shidler	89	260	349	26.0
Shields Hieghts		576	576	
Southern Hills		650	650	
Spencer	17	468	485	3.5
Stand Watie		499	499	
Stonegate		492	492	

ELEMENTARY SCHOOLS	Blacks	Others	Total	% Black
Star	8	408	416	1.9
Sunset		362	362	
Taylor	58	139	197	29.4
Telstar	5	631	636	.7
Truman	632	1	633	99.9
Tyler	4	180	184	2.1
University Heights[5]		248	248	
Valley Brook		236	236	
Van Buren		394	394	
West Nichols Hills		437	437	
Western Village		586	586	
Westwood	3	530	533	.5
Wheeler		519	519	
Willard	14	457	471	2.9
Willow Brook		613	613	
Wilson	26	326	352	7.3
Woodson	331	3	334	99.2
Wright[6]	84		84	100.
TOTAL ELEMENTARY	9961	33253	43214	23.0

SECONDARY SCHOOLS JUNIOR HIGH	Blacks	Others	Total	% Black
Bryan[7]	3	14	17	17.6
Capitol Hill Jr.	33	918	951	3.4
Central	110	858	968	11.4
Eisenhower	150	913	1063	14.1
Harding	467	649	1116	41.8
Hoover	2	1563	1565	.1
Jackson	2	1063	1065	.1
Jefferson	2	1643	1645	.1
Kennedy	1541	4	1545	99.8
Moon	685	4	689	99.4
Roosevelt		1334	1334	
Taft	8	1372	7380	.5
Webster	3	904	907	.3

[5]Closed in 1969.

[6]Closed in 1969.

[7]Phased out in 1969 and set aside for the physically handicapped.

SECONDARY SCHOOLS	Blacks	Others	Total	% Black
JUNIOR-SENIOR				
Dunjee	600	2	602	99.6
Star Spencer	375	1469	1844	20.3
SENIOR HIGH				
Northwest Classen	16	3065	3081	.5
Southeast		1625	1625	
Capitol Hill Sr.	16	2003	2019	.7
Classen	244	814	1058	23.0
Douglass	1418	5	1423	99.6
Grant		2188	2188	
Marshall	23	2300	2323	.9
Northeast	501	388	889	56.3
CENTER				
Adult Day	91	77	168	54.2
Carver	4	46	50	8.8
TOTAL SECONDARY	6294	25221	31515	19.9
GRAND TOTAL K-12	16255	58474	74729	21.7

APPENDIX F

RACIAL COMPOSITION OF OKLAHOMA CITY SCHOOLS, 1969[1]

ELEMENTARY SCHOOLS	Blacks	Others	Total	% Black
Adams	1	875	876	.1
Arcadia	62	23	85	72.9
Arthur		809	809	
Belle Isle	32	334	366	8.7
Bodine[2]	1	472	473	.2
Britton	1	435	436	.2
Buchanan	3	617	620	.5
Burbank	14	422	436	3.2
Cleveland	11	295	306	3.6
Columbus		456	456	
Coolidge	3	1019	1022	.3
Creston Hills	551	1	552	99.8
Culbertson	865	4	869	99.5
Davis		392	392	
Dewey	591	17	608	97.2
Dunbar	453	4	457	99.1
Edgemere	12	442	454	2.7
Edison	371	2	373	99.5
Edwards	363	5	368	98.6
Emerson	8	195	203	4.5
Eugene Field	4	332	336	1.2
Fillmore	1	722	723	.1
Garden Oaks	543	1	544	99.8
Garfield	1	331	332	.3
Gatewood	2	224	226	.9
Green Pastures	242		242	100.0
Harmony	806	6	812	99.3
Harrison	1	383	384	.3
Hawthorne	1	471	472	.2
Hayes		787	787	
Henry	1	162	163	1.0
Heronville		496	496	

[1]Oklahoma City Public Schools Department of Research and Statistice Report, "Pupil Membership by Grade and Race," December 5, 1969, pp. 1-4.

[2]New School.

ELEMENTARY SCHOOLS	Blacks	Others	Total	% Black
Hillcrest	1	966	967	.1
Horce Mann	6	362	368	1.6
Johnson		536	536	
Kaiser	2	479	481	.4
Lafeyette		287	287	
Lee	4	527	531	.8
Lincoln	768	12	780	98.5
Linwood	3	381	384	.8
Lone Star		108	108	
Longfellow	630	7	637	98.9
Madison		447	447	
Mark Twain	57	300	357	16.0
Mayfair	31	402	433	7.2
McKinley	2	277	279	1.0
Monroe	3	498	501	.6
Nichols Hills	2	534	536	.4
North Highland	154	391	545	28.3
Oakridge		480	480	
Orchard Park	52	108	160	32.5
Page	327	3	330	99.1
Parker[3]	748	5	753	99.3
Parmelee		513	513	
Pierce		394	394	
Polk	618	12	630	98.1
Prairie Queen	2	1143	1145	.2
Putnam Heights	10	411	421	2.4
Quail Creek	1	377	378	.3
Rancho	10	359	369	2.7
Ridgeview		829	829	
Riverside	43	149	192	22.4
Rockwood	15	843	858	1.7
Ross		231	231	
Sequoyah		381	381	
Shidler	66	254	320	20.5
Shields Heights		560	560	
Southern Hills		656	656	
Spencer	100	365	465	21.5
Stand Watie		480	480	
Stonegate		604	604	
Star	11	351	362	3.1
Sunset	27	335	362	7.5
Taylor	136	91	227	59.9
Telstar	3	541	544	.6
Truman	626	2	628	99.7

[3]New School.

ELEMENTARY SCHOOLS	Blacks	Others	Total	% Black
Tyler	7	153	160	4.4
Valley Brook		209	209	
Van Buren		350	350	
West Nichols Hills		459	459	
Western Village	2	578	580	.3
Westwood	11	486	497	2.2
Wheeler	1	545	546	.2
Willard	17	445	462	36.7
Willow Brook	3	531	534	.6
Wilson	21	319	340	6.2
Woodson	350		350	100.0
TOTAL ELEMENTARY	9814	31800	41614	23.6

HIGH SCHOOLS	Blacks	Others	Total	% Black
Rogers[4]	233	841	1074	21.7
Capitol Hill Jr.	36	949	985	3.7
Central	77	839	916	8.4
Eisenhower	304	724	1028	29.6
Harding	361	941	1302	27.7
Hoover	7	1554	1561	.5
Jackson	11	1036	1047	1.1
Jefferson	1	1595	1596	.1
Kennedy	1319	2	1321	99.8
Moon	686	4	690	99.4
Roosevelt		1394	1394	
Taft	160	916	1076	14.9
Webster	2	893	895	.2
Dunjee	667	1	668	99.9
Northwest Classen	301	2326	2627	11.5
Southeast	4	1662	1666	.2
Star Spencer	248	942	1190	20.8
Capitol Hill Sr.	29	2035	2064	1.4
Classen	286	665	951	30.1
Douglass	1359	6	1365	99.6
Grant	1	2056	2057	.1
Marshall	33	2276	2309	1.4
Northeast	429	603	1032	41.6

[4]New "Middle School."

HIGH SCHOOLS	Blacks	Others	Total	% Black
Adult Day	169	214	383	44.1
Carver	8	61	69	11.6
Washington[5]	40	25	65	61.5
TOTAL SECONDARY	6771	24560	31331	21.6
GRAND TOTAL	16585	56360	72945	21.4

[5]New Adult Education Center.

APPENDIX G

A COMMUNICATION MODEL

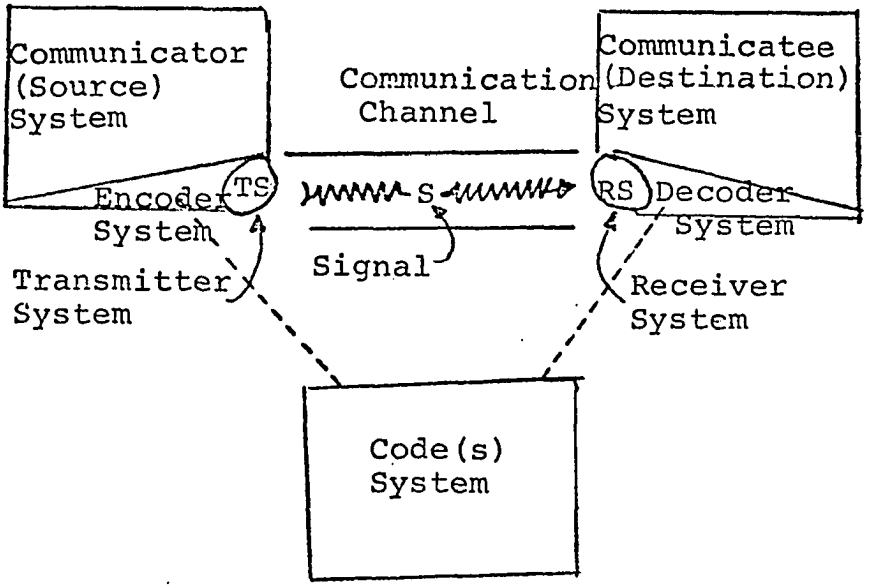


Fig. 1 - Model of an Idealized Communications System

In the model, the system elements are functionally and conceptually distinguishable from one another. In the actual workings of communication units, the source and destination systems (or communicator and communicatee respectively) may be integrated, the distinction merely resulting as a consequence of position in the direction of the flow of communication.

The use of the term "system" anticipates the handling of multiple signals (transmission or receiving, encoding or decoding), either in one or more than one communication channel. Furthermore, this tacitly assumes that they are not simple mechanical elements but are sub-systems and could further be analyzed as systems in themselves.

Code systems could possibly be verbalized, but not necessarily with the user conscious of this --- particularly where the communication unit is one with which the question of consciousness does not even arise. It is possible for responses to be "built-in" reflexes or unconscious devices that "work"; where the communication unit's encoding or decoding mechanism does not involve any element of consciousness.

Legend for the diagrams following:

ICCS - Integrated Communicator-Communicatee (Source-Destination) System

CrS - Communicator (Source) System

CeS - Communicatee (Destination) System

RS - Receiver System

TS - Transmitter System

ES - Encoder System

DS - Decoder System

C-C - Communication Channel

S - Signal

CS - Code(s) System(s)

Notes on diagrams: ICCS, CrS or CeS are identifiable by the quadrangular figures, including in it:

Circular figures denoting RS or TS, and triangular figures denoting ED or DS.

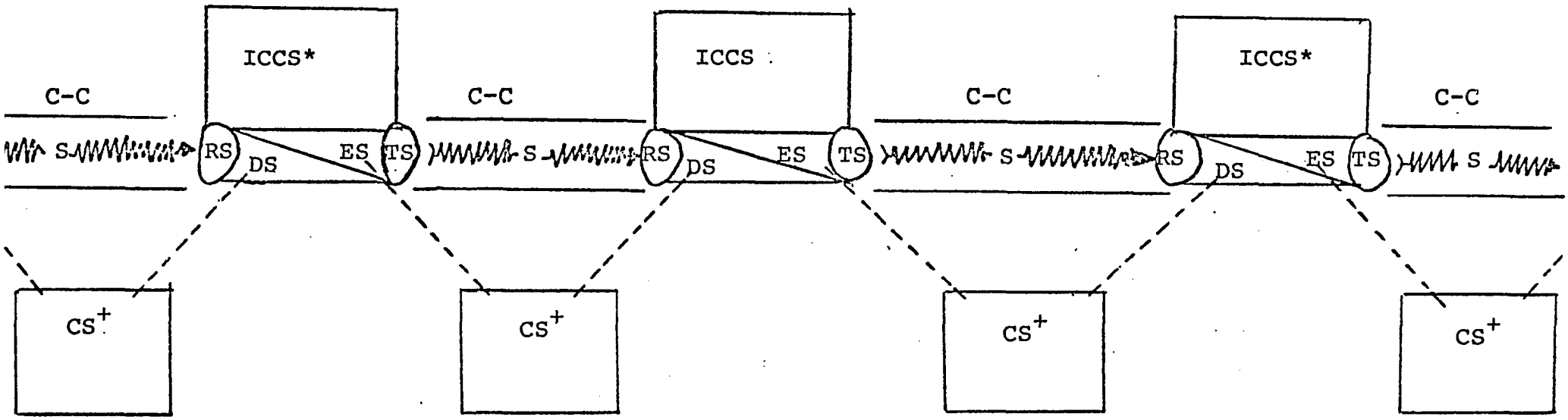
Communication channels are laid off by two parallel lines, to simplify directional flow of communication between CrS and CeS, even if in nature such communication channels may be even four-dimensional.

Signals are denoted by jagged lines directionally indicated from a TS to at least one RS.

Broken lines indicate access to code(s) system(s).

CS's are identifiable by plain (unlike the ICCS, CrS or CeS) quadrangular figures.

In some instances, CS, ICCS, CrS or CeS may have subscripts if it is important to make a distinction between such elements where such identification is used.



303

Fig. 2 - Flow of communication, showing integration of Communicator (Source) and Communicatee (Destination) systems in one unit of communication.

* Integrated communicator-communicatee system at ends may coincide and thus indicate a circular flow of communication.

+ Codes may coincide or vary depending upon whether the integrated communicator-communicatee systems use one or more than one code, and one or more than one channel.

Furthermore, reproduction of an initial message from one channel to another essentially involves a different code used in each case, although an interesting parallelism or homology may be indicated and reconstructed.

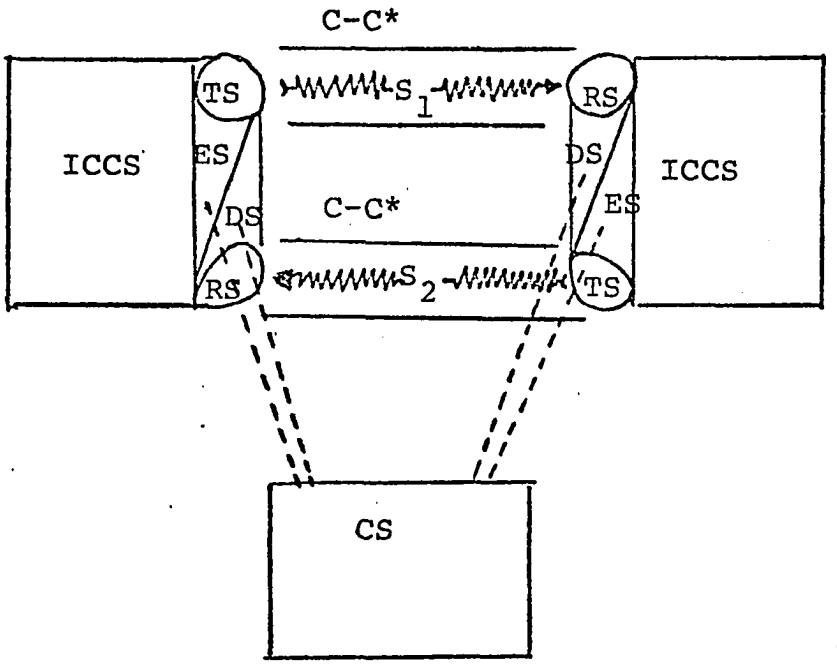
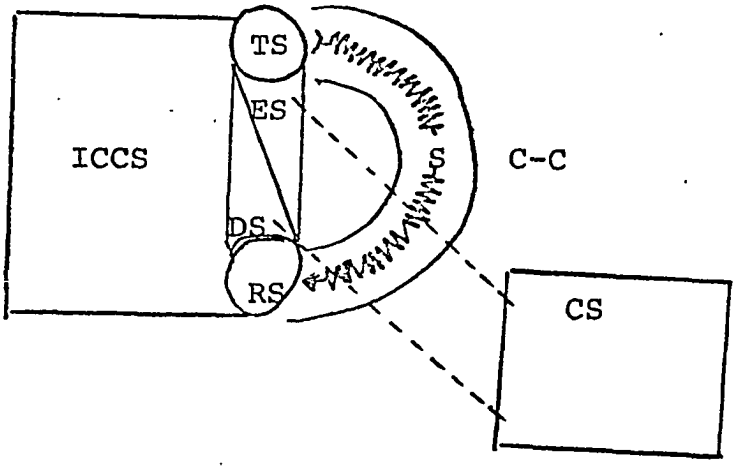


Fig. 3 - Two-way communication between Integrated Communicator-Communicatee Systems.

*The Communication Channels indicated above may be in fact identical or the same. Separation was only made as a constructive aid to indicate directional flow of communication.

"Feedback" can be taken in this case as a special instance of the type of communication as illustrated above, involving the same processes of transmission and reception, although it refers more to the effect on the transmission (continued) of the message to which its receiver system has access on the same communication channel it was originally sent.

A.



B.

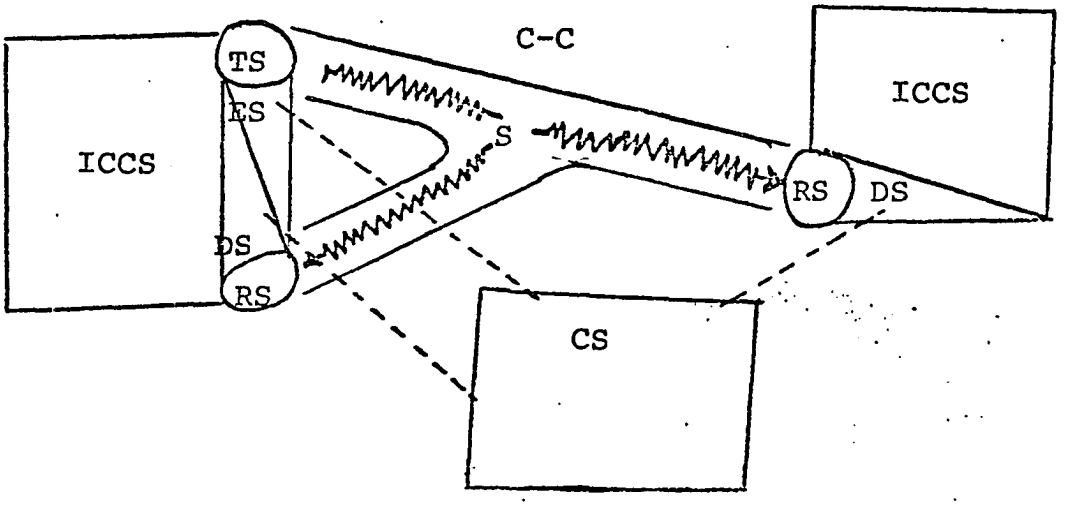


Fig. 4 - Signal Feedback mechanisms. A. Total Feedback. B. Incidental Feedback.

Feedback occurs where the communication channel is not closed to the original communicator (source) system, but where as communicatee (destination) system an ICCS has access to the same channel. In a sense, where it receives the signals it itself sends out, this phenomena can possibly create or lead to other consequences, such as so-called "private" codes or languages as in "A" above.

Limiting lines indicating the communication channel hardly do justice in denoting a more pervasive (possibly four dimensional) continuum that communication media usually are, in nature.

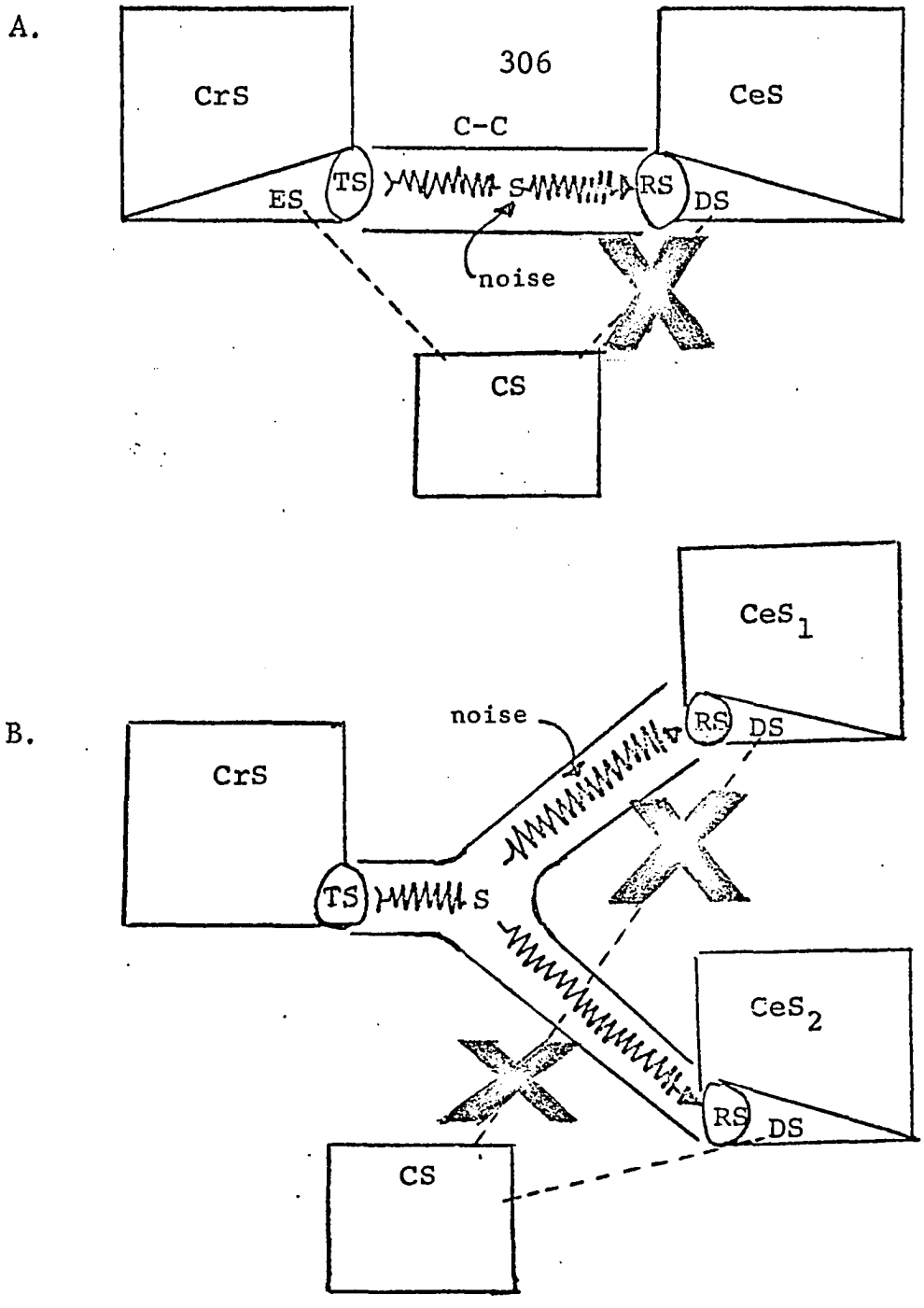


Fig. 5 - Noise: Its Origin and Nature.

Originally, I had considered noise to come about if there was no code to which the CeS could refer to for decoding signals received. However, the fact that what may be noise to one CeS may be meaningful communication signals to another would indicate that it is access to such a code that makes signals interpreted as meaningful and that lack of such access makes it noise (See "B" above

in particular for this example, since "A" is the more general model for the phenomenon). Somehow I have taken "code" in a more general way rather than limit its use to encompass only simple linguistic systems which represent only one sub-class. In any case though, the notion of code assumes the possibility of it being linguistically produced or reproduced even if it is not so available at the moment.

Cf. insect "communication."

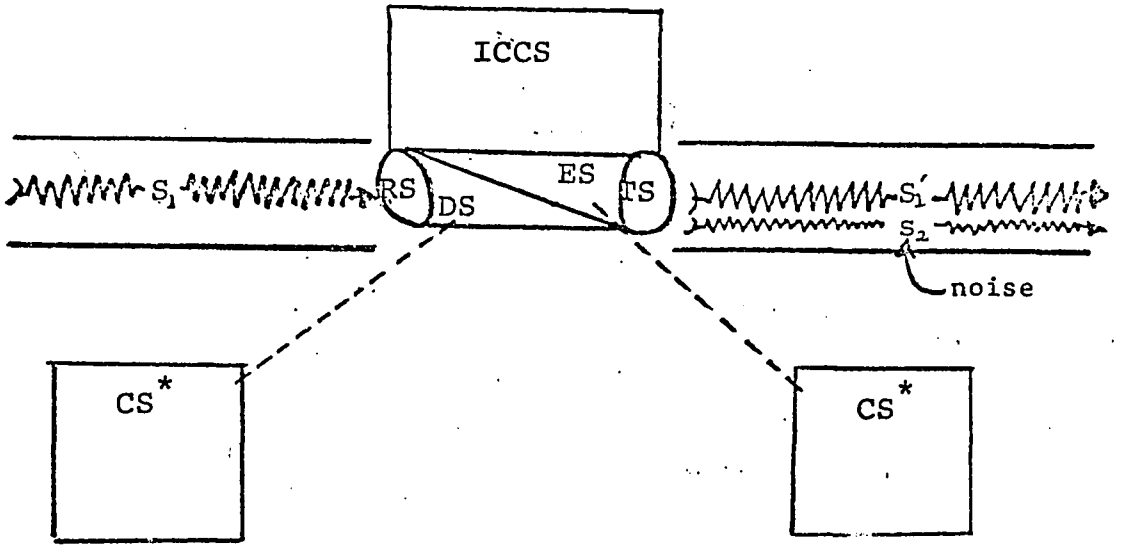


Fig. 6 - Noise as a function of reproduction.

Note again that codes may coincide, depending upon whether the same or a different communication channel is used in retransmission of an originally received message. Fidelity would then be the quality of reproduction where one code is used for re-transmission of an originally received message with a minimum of extraneous signals or signal factors.

In a way, the original assumption of noise as being due to the absence of a code (see note of Fig. 5) would be correct in this example, since the lack of a code to refer signals to would result in the signal's being interpreted as "noise". Noise then becomes a differential aspect of reproduction of an originally received signal in this instance. And where there is no code, then certainly, there can be no access. But since there may be a code without being accessible, as in the preceding figures, then this instance only belongs to a sub-class of the general phenomenon of noise. Noise, then, results more specifically when access to a code to interpret signals received is not possible or available.

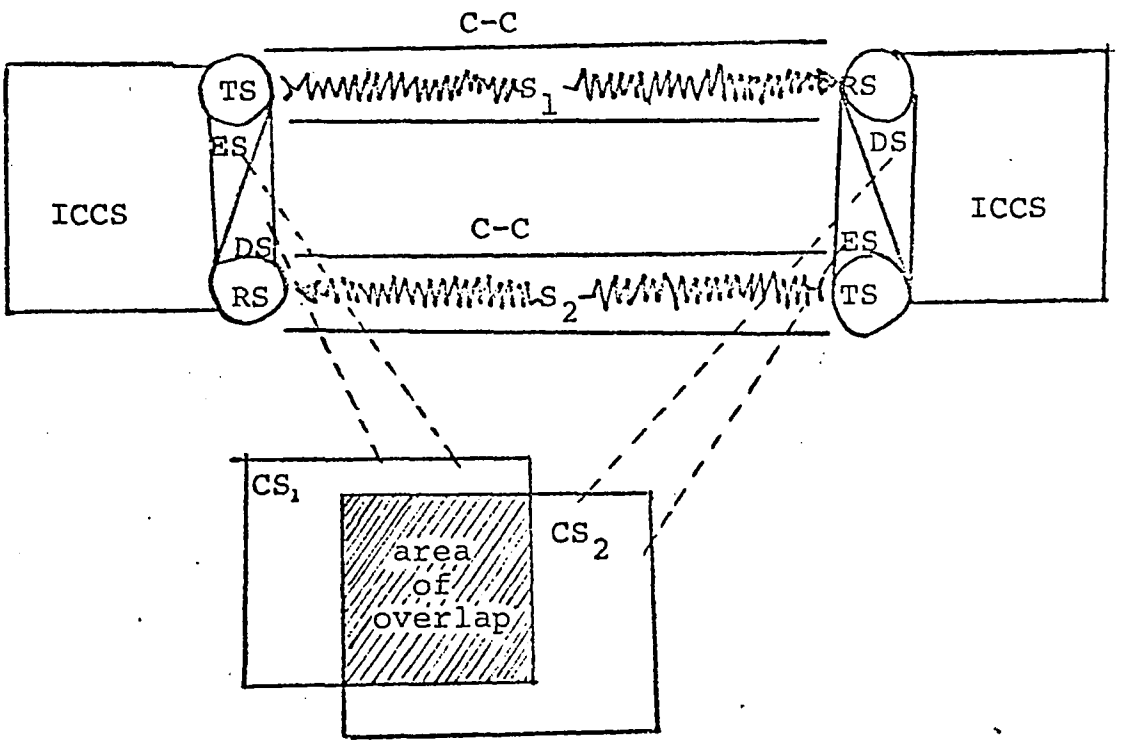


Fig. 7 - Pseudo-Communication.

The presence of different codes, even if the same communication channel and similar signals are used, result in pseudo-communication.

The usual assumption is that the communication channels used are identical or the same, for only in such an instance could this phenomenon easily occur and be identifiable. It is still possible, even if the communication channels are different; however, this type is not as frequent as when the communication channels are the same.

ELEMENTS OF COMMUNICATION

(The Model Explained)

I. Elements: There are three basic components of a Communication System:

A. A Communicator (also: Source) System,

B. A Communicatee (also: Destination) System, and

C. A Message System

II. Definitions:

A. Communication System - a set of communication units involving such basic elements as the communicator, communicatee and message, related and functioning in such a manner as to facilitate the transmission of a message from communicator to communicatee.

B. Communicator (Source) System - a basic unit in the communication process, essentially at the initiating end of the communication relation or process. It includes transmitter and encoder systems.

C. Transmitter System - a part of a communicator (source) system that creates the signals to be sent through a medium to be known as a communication channel.

D. Encoder System - a part of a communicator (source) system which picks out from a code system such items that may be sent in a meaningful sequence over a communication channel by a transmitter.

E. Signals - physical configurations that are created by transmitters and sent through media known as communication channels. Signals may be disturbances in the atmosphere, visual stimuli, tactile stimuli or any other form of stimuli that can impinge upon receptor systems, and capable of transmitting meanings. Signals, hence, are outputs of communicator (source) systems and inputs for communicatee (destination) systems.

F. Communication Channel - a physical medium through which communication takes place, as a means through which the signals are propagated from a transmitter system to a receiver system.

G. Code System - a system of signs, symbols and symbol devices, with rules of formation and transformation of meaningful series of signals

that may be sent or received through a communication channel. Languages are code systems, basically.

H. Message System - essentially the system that relates communicator to communicatee; it includes not only the signals transmitted and received through a communication channel, but also the meaning which can be derived from an application of the code rules to the sequence of signals received. Generally, the message may be regarded as a meaningful combination of signals transmitted or received in the process of communication, or the meaning of that combination of signals.

I. Communicatee (Destination) System - another basic unit in the communication process, essentially at the receiving end of the communication relation or process. It is analogous to the communicator (source) system, and includes receiver and decoder systems.

J. Receiver System - a part of a communicatee (destination) system that receives signals from source systems through the communication channel(s) to which it is attuned.

K. Decoder System - a part of a communicatee (destination) system which interprets the signals or sequence of signals received in accordance with rules from a code from which the meaning of such signals or sequence could be presumably drawn.

III. Assumptions:

A. Each of the basic components of the communication relation or process can be analyzed further in terms of other level constructs. [Note however, that no attempt at reductionism should be read into this.] For instance, the communicator (source) system can be analyzed in terms of its component encoder and transmitter systems. The communicatee (destination) system can be analyzed in terms of its component decoder and receiver systems. Other components in these systems that do not figure in the communication process or relation are to be ignored in the analysis. And the message system can be analyzed in terms of the communication channel, the code(s) and the signals.

B. All these sub-systems are also systems in themselves in that each unit as well as the elements that compose them can still be further analyzed in terms of less complex parts. Further analytic "breakdown" however may bring us out of the field of communication into some

other level of analysis. [Note again how this could lead to reductionist fallacies when one is not too careful in observing the limits of the inquiry.]

C. Both forms of communicator (source) and communicatee (destination) can be found incorporated in single communication units. The conceptual distinction is only one based on function, since the same unit may be communicator (source) at one time and a communicatee (destination) at another. It is its function in the communication process or relation that determines whether a communication unit is source or destination. The same thing is true for encoder and decoder systems: the conceptual distinction being merely one based on function, for structurally, it may be the same component of the communication unit.

D. A communication system involves at least a communicator (source), a communicatee (destination) and a message system.

E. A communicatee (destination) may be a communication unit similar to, or of the same level as, or even of another level as, the communicator (source).

F. A communicator (source) can transmit some messages to more than one communicatee (destination) at the same time.

G. A communicator (source) can send several messages over as many communication channels to which it has access, to just as many, or even more, communicatees (destinations). Access to a communication channel technically involves having a transmitter capable of generating signals through the medium that is the communication channel.

H. Messages sent over different communication channels require different code systems; the same code for decoding ideally the one used initially for encoding.

I. Communication channels are of two types:

   1. open channels - these are media that allow more than one communicatee (destination) access to the messages(s) transmitted through them.

   2. closed channels - these are media that limit access only to intended communicatee(s) or only those who may be accidentally or willfully interposed between source and legitimate or intended destination(s).

J. A code system can itself be complex, in being a composite of more than one code system, such systems incorporated into a more complex system making sequences of signals on the same or different communication channels capable of having a functionally new or different meaningfulness than those derivable from each component code.

IV. Propositions and corollaries:

A. A communicator (source) can transmit messages to more than one communicatee (destination) at a time, deliberately or unintentionally, where there is unlimited access to the communication channel(s) and where the signals can be received and decoded by the communicatees (destinations).

B. Since signals used in transmitting messages are of a physical nature, communication units with receivers "tuned" into the channel in which these signals are transmitted can receive impulses that may be decoded on the basis of a known code, or else be evaluated as "noise" or "interference" in the absence of access to a code that can make them meaningful.

C. If a communicator transmits messages using a certain code system and the communicatee uses a different code system, then communication is faulty; or else, none occurs at all.

Corollary: Communication is faulty in the interpretation of uncoded signals as "noise" or "interference", or else where they are miscoded as in the instance of pseudo-communication.

D. Some messages are essentially private in the sense that only between the communicator and intended communicatee(s) do the signals pass and are received; other messages can be received by "accidental" communicatees, unintentionally on the part of each, or intentionally on the part of at least one.

Corollary 1: Where the communicatee is itself the source of the signals, then total feedback occurs.

Corollary 2: Where the communicatee (destination) is the only one that has access to the code system, it does not make much difference if it is not the only one who has access to the message. Since only access to a code can

facilitate decoding, the signal sequence meaning can only be readily available to that communicatee with access to the code. This, then, would still be an instance of closed or private communication.

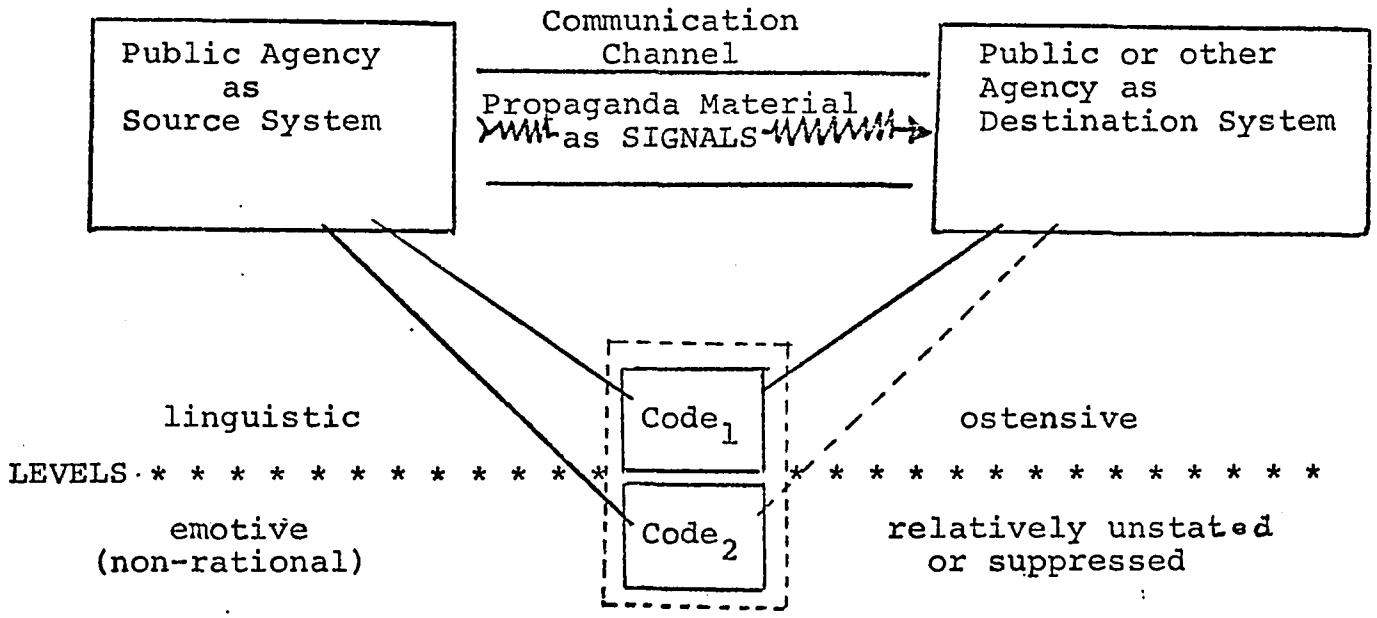
E. Where a message, in consisting of physical configurations transmitted through the communication channel, does not change its structure when the signals composing it are received by a communicatee, it can still be received by other communicatees, even by others unintended, and even possibly before the intended communicatee does.

F. Messages may be retransmitted from one channel to another by an integrated communicator-communicatee (source-destination) system, if it has the appropriate receiver-decoder and encoder-transmitter systems for the required channels.

G. The fidelity of reproduction of messages by an integrated communication-communicatee (source-destination) system is a function of the inter-relations between the receiver and decoder systems, between the encoder and transmitter

systems, and between the receiver-decoder system and the encoder-transmitter system.

In terms of the model a public agency propaganda process may be analyzed as:



$Code_1$ and $Code_2$ may themselves consist a code system. Effect of propaganda material can hence be identified as to whether the destination system decodes the signals (the propaganda material) as the public agency intends. Note further that only a broken line connects the destination system and $code_2$ denoting an unconscious linkage; whereas that connecting it and the

originating public agency is a solid one, denoting conscious access. It is not inconceivable, though, that the destination system is just as connected to the secondary code or that the public agency has only an unconscious linkage. However, this would hardly be the ideal-typical view of a public agency as propagandist, assumed to be interested in initiating action, and the destination system, the public, usually as typically uncritical and unreflective.