DOCUMENT RESUME

ED 084 960 HE 004 840

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TITLE The Selection of Decision Process Paradigms in Higher Education: Can We Make the Right Decision or Must We Make the Decision Right?
INSTITUTION California Univ., Berkeley. Ford Foundation Program for Research in Univ. Administration.
REPORT NO Pap-42
PUB DATE Oct 73
NOTE 74p.
AVAILABLE FROM Center for Research in Management Science, University of California, 26 Barrows Hall, Berkeley, California 94720 ($1.95)

EDRS PRICE MF-$0.65 HC-$3.29
DESCRIPTORS *Decision Making; Decision Making Skills; *Educational Administration; Educational Research; *Higher Education; *Policy Formation; Problem Solving; Productive Thinking; Research Reviews (Publications)
IDENTIFIERS *University of California

ABSTRACT

Decisionmaking in organizations is examined from the perspective of open systems organization theory. Employing this perspective, this paper represents a critique of the views held by planners and systems analysts and the conflicting assumptions of their critics. The conclusion reached is that neither the assumptions held by planners, nor those of their critics are wholly acceptable to the policymakers. Policymaking requires a mixed strategy of decisionmaking that is dependent on situational constraints and on tradeoffs between desirable but conflicting values. This paper begins by briefly describing a controversy over the management and organization of the University of California library system. A theory of decision process selection is suggested that provides a framework for analyzing this controversy. This theory suggests that there are 2 major paradigms that policymakers use to describe decision processes. The historical roots of these paradigms are noted and the paradigms are described. The report suggests that there is a gap between normative assumptions of the decision process paradigms and the conclusions drawn following an examination of the constraints and values found in higher education. (Author/PG)

FORD FOUNDATION PROGRAM FOR RESEARCH IN UNIVERSITY ADMINISTRATION

Office of the Vice President—Planning
University of California

FORD GRANT NO. 680-0267A

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THE SELECTION OF DECISION PROCESS PARADIGMS IN HIGHER EDUCATION:

Can We Make the Right Decision or Must We Make the Decision Right?

Frank A. Schmidlein

"The Method of Reason does not require that men do what they lack time to do, or lack experience to do, or, for that matter, lack brains to do. I get impatient with the scholarly critic who sets up as the first step of the Method of Reason a clean and searching analysis of the problem; I get impatient not because that is not a good first step (after the information has been gathered) but because it is not part of the Method of Reason to demand such analysis of men to whom the problem is stubbornly refusing to open for analysis."

Karl Llewellyn
"The Common Law Tradition:
Deciding Appeals"

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PREFACE

This is one of a continuing series of reports of the Ford Foundation sponsored Research Program in University Administration at the University of California, Berkeley. The guiding purpose of this Program is to undertake quantitative research which will assist university administrators and other individuals seriously concerned with the management of university systems both to understand the basic functions of their complex systems and to utilize effectively the tools of modern management in the allocation of educational resources.

This paper has grown out of the writer's interest, over several years, in the processes by which organizations, particularly institutions of higher education, make decisions and develop policies. The piecemeal and ad hoc nature of decisions in most organizations aroused interest in the processes and techniques of formal planning. An examination of planning theory and practices led to a recognition of the practical limitations placed on this method of decision making. Resources for analysis are always limited, decisions often cannot wait for analysis, and consensus on values and objectives is difficult to achieve in most circumstances. Planners thus are constantly frustrated in their attempts to impose their norms of rationality on organizations. The dilemma resulting from this recognition of the short-comings, both of traditional and of planning decision processes, led to a general examination of the decision process in organizations [Schmidtlein, 1973] and to the formulation of a theory of decision process selection. The latter is presented in this paper.

During the development of this paper, an opportunity arose to examine the controversy between the California State Department of Finance and the University of California over the organization and management of the University's library system. This controversy presents an excellent opportunity to examine the validity of the theory proposed here. As a result, a case study of the UC library controversy is planned in order to test empirically the assumptions set forth here and to analyze the structural implications of the use of alternative decision process paradigms by policy makers. A second report will contain the findings of this empirical study of library planning.

This paper has profited greatly from discussions with Dr. Lyman Glenny, Professor of Higher Education, University of California, Berkeley; Dr. Martin Trow, Professor of Public Policy, University of California, Berkeley; Dr. Guy Benveniste, Associate Professor of Education, University of California; and my associates at the Ford Foundation Program for Research in University Administration. Lengthy discussions with other professors and my fellow graduate students in the higher education program at UC Berkeley pointed out important sources of ideas and greatly sharpened my views. The extensive reviews and comments on earlier drafts of this paper by Dr. Thomas A. Morehouse, Associate Professor of Political Science, University of Alaska; Mr. Richard Messinger, Higher Education Program, University of California, Berkeley; and Ms. Jane Bolce, Research Assistant, Ford Foundation Program for Research in University Administration, University of California, Berkeley, were particularly helpful. I am deeply indebted to Dr. Frederick Balderston, Professor of Business Administration, University of California, Berkeley, and Co-Director of the Ford Foundation Program for Research in University Administration, for his patient support and his help in facilitating the conduct of this study.

INTRODUCTION

The processes of decision making in organizations described in this paper are examined from the perspective of open systems organization theory. The application of open systems theory to organizational decision making is described in an earlier paper [Schmidtlein, 1973]. Employing this perspective, the paper represents a critique of both the views held by planners and systems analysts and the conflicting assumptions of their critics. The conclusion reached is that neither the assumptions held by planners, nor those of their critics are, in their extreme forms, wholly acceptable to the policy makers. Policy making requires a mixed strategy of decision making that is dependent on situational constraints and on trade-offs between desirable but conflicting values. The desired mix of decision processes has important structural implications for organizations since the location of decision authority is a critical consideration in the design of an institution.

The paper begins by briefly describing a controversy over the management and organization of the University of California library system. A theory of decision process selection is then suggested that provides a framework for analyzing this controversy. The theory suggests that there are two major paradigms that policy makers use to describe decision processes. The historical roots of these paradigms are noted and the paradigms are then described and compared in some detail. Following this analysis of the competing descriptions of the decision process, there is an elaboration of the initial theory of decision process selection. The conclusion suggests that there is a gap between the

normative assumptions of the adherents to both of the decision process paradigms and, on the other hand, the conclusions drawn following an examination of the constraints and values found in the field of higher education.

THE PROBLEM

The University of California Library System Controversy.

A controversy exists between the State of California Department of Finance and the University of California over the organization and management of the University's library system. This controversy provides an excellent opportunity to conduct a case study of the conflict between two views of what constitutes a legitimate and effective decision process in organizations and the implications that alternative decision processes hold for the organization of the library system. A report by the Audits Division of the State Department of Finance [1972] on the library system, and the response by the University [1972], both give evidence of differing views on the nature of appropriate University decision processes. The report by the Library Task Force [1972] to Vice President C. O. McCorkle, Jr., of the University, gives further indications of a tension between the desire for a credible library plan and a conflicting desire to maintain the traditional decision structure of the University.

The issues involved in the controversy between the State Department of Finance and the University of California are both substantive and procedural. For example, recommendations were made by the auditors that the University's book acquisitions program be restrained until there was further clarification of national manpower trends and research support policies. Another suggestion was made that consideration be given to redistribution of graduate programs. Among examples of procedural recommendations were, (1) centralizing the holdings of little-used

research materials, and (2) increasing the interdependence and coordination between libraries to avoid duplication (Audits Division, Department of Finance, 1972). The University made a lengthy response to the Audit report and listed "points of misunderstanding" (University of California, 1972). Among these "misunderstandings" were disagreement over the distinction between core and research collections in libraries and between necessary and unnecessary duplication.

A larger procedural dispute, however, appears to overshadow specific points of contention in the audit report and the University response. This dispute has to do with the effectiveness and legitimacy of the processes of decision making implicit in the Audit Division's activities and in its recommendations. The library audit represents more active participation of the State government in the University's policy making and decision processes, and is in line with the growing activism of state governments in the field of higher education in the pursuit of coordination, management efficiency and public accountability. Increased centralization of the University structure and greater central initiative at the University system level were recommended to deal with issues developed in the report. Clues to the auditors' view of appropriate policy processes are contained in the preface of their report:

> The study was undertaken to assist both the President of the University and the State Director of Finance to plan the University's future growth as systematically as possible. [p. i]
>
> ... the report was written primarily for high-level University and state administrators [p. i].

One can infer from these quotations that policy and planning are considered to be primarily the domain of these central figures and that they have both the responsibility and means to effect decisions. Further

comments in the auditor's report reinforce this impression that policy and decision making was seen as a centralized process. One recommendation in this vein was:

> That increasing the interdependence of UC libraries to avoid unnecessary duplication become a high priority University goal [p. 49].

Response to the report by the University generally dealt with the specific issues raised by the auditors. The responses usually indicated agreement with some reservation. Only in a few instances did University comments explicitly reject the assumptions described above; which are implicit in the audit and its recommendations. Among the University's comments, the most pertinent to this issue are the following:

> It is not obvious that the goal of providing satisfactory access to adequate research collections can be met at less cost through coordination . . . [p. 13].
>
> . . . each campus must remain a viable unit and a certain amount of duplication must be expected for that reason . . . [p. 13].
>
> Our libraries are alert to the necessity of making the most economical acquisitions. Their professional judgment is important and their individual decisions are made on the basis of academic programs on their campuses and within available resources [p. 17].

One final quotation, perhaps, best illustrates what appears to be an underlying concern of the University - a concern with decision processes and their location in the structure, as distinct from concern over the substance of the recommendations:

> The establishment of exact procedures to carry on studies and implement recommendations are internal matters that should be left to the University's responsibility [p. 19].

The Context in Which the Library Controversy is Taking Place: Conflict Over Decision Process Paradigms.

The controversy over the U.C. library systems is an example of a larger debate underway in higher education over the legitimacy and the effectiveness of two conceptions, or paradigms, of the policy-making decision process. The first conception is termed the *comprehensive/prescriptive* (C/P) *paradigm;* the second the *incremental/remedial* (I/R) *paradigm*. The C/P process is typified by the concepts of planning: the PPBS approach to budgeting (Hitch and McKean, 1960), the applications of techniques of operations research (Churchman, Ackoff and Arnoff, 1957), systems analysis (Churchman, 1968), and decision analysis (Raiffa, 1968). The I/R decision process is exemplified by the concept of the operations of the "market" in economics (Friedman, 1962), the budget process described by Wildavsky (1964), and the political processes described by Braybrooke and Lindbloom (1963). Each point of view has its advocates among higher education policy makers. Proponents of each side of the debate foresee great dangers for higher education if their paradigm does not become the dominant mode of decision-making.

The substance of this conflict concerns both the *legitimacy* and the *effectiveness* of the two paradigms. For example, the legitimacy of the C/P paradigm is criticized because of fear that planning leads to control and centralized authority. The legitimacy of the I/R paradigm is questioned because of fears that the collective interest is not served by inefficient, unregulated market processes which can allow power to accumulate in a few hands that are not accountable to the

public interest.[1] Recent questions are focusing more on the relative effectiveness of the two decision paradigms. The PPBS approach, for example, is based on a belief that in a complex and rapidly changing modern society, traditional decision processes are no longer an adequate basis for determining policy.

> . . . in part as a consequence of the rapid growth of the Fifties and Sixties, most institutions are not entering the Seventies with an arsenal of tested modern management tools to face the challenge.
>
> . . . Currently, institutions, state and regional coordinating bodies, and others interested in higher education are working actively on these and other problems; but for maximum progress to occur, there is a need for a common and generally accepted framework and set of definitions of "language" for institutions to be able to exchange information and analytical developments in a mutually beneficial way. [Lamson, 1972, p. 1]

The difficulties encountered in attempting to implement planning processes such as PPBS, however, have given rise to critiques:

> Deeper insight suggests that PPBS may represent the even more disastrous triumph of economic rationality over the political and social rationality which reasonably, logically, and necessarily belong in government decisions on resource allocation. [Hoos, 1972, p. 74]

Much of the conventional analysis of the conflict between the competing decision paradigms assumes that each paradigm generally is feasible in all areas of policy-making, and that the factors that limit the effectiveness of any particular decision strategy are the "perverse characteristics" of people. Rarely is an examination undertaken of the basis for this "perverse" behavior -- behavior which is blamed on a lack of rationality or the pursuit of selfish interests. Thus, conventional wisdom assumes that a particular decision process is selected and

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[1] Dahrendorf describes this conflict over the legitimacy of decision paradigms (1968).

as a result certain consequences occur which are either favorable or unfavorable, depending on the observer's values. The premise upon which the proposed research is based suggests that constraints present in the decision environment determine to a considerable extent the actual decision process employed. Therefore,

> Instead of developing decision models in general it might be more valuable to look at decision making as a process which varies in response to the particular societal environment. (Alexander, 1972, p. 325).

The Theoretical Perspective: Decision Constraints and Value Trade-Offs.

This paper presumes that the two decision process paradigms briefly described above are not equally effective in all environments. The factors that limit their application result more from the constraints present in the physical and social environment of the area subject to decision than in the characteristics of participants. The irrational behavior commonly attributed to those who frustrate the progress of decision processes is found to be highly understandable after an analysis of environmental constraints. These constraints fall into five categories:

- time and space limitations;
- knowledge of causal relationships, change technologies, and outputs;
- resources available for analysis;
- consensus among parties to decisions; and
- functional demands associated with various roles.

The presence of different sets of these constraints determine the bounds within which it is feasible to employ a particular decision process.

The specific decision process to be employed, within the bounds set by the constraints, is determined by trade-offs between conflicting values that are embodied in each of the decision paradigms. For example, the prescriptive nature of the C/P paradigm favors its use in undertaking major departures from practice. It serves as a means to make prompt changes in times of high uncertainty. The I/R paradigm, which operates through processes of mutual accommodation, results in gradual changes and thus favors stability. In practice some accommodation is needed between an emphasis on the changes required to adapt to new conditions and an emphasis on stability. Some level of stability is necessary to maintain the common assumptions and understandings that are a prerequisite for collective action.

Implications for Policy: Identification of Constraints and Value Trade-Offs Will Lead to the Selection of More Effective Decision Processes.

If the above theory is accurate, the implications for policy-makers are far-reaching. First, policy analysis should focus more on the social and physical environmental constraints that limit the use of decision strategies than on the internally motivated behavior of individuals. The analytically unsophisticated and unproductive tendency to write off behavior as irrational will be reduced; or at least there will be a reduction of the areas of behavior ascribed to irrationality. Examinations of constraints will facilitate a more sophisticated analysis of behavior.

An understanding of specific constraints that sometimes influence the effectiveness of decision processes will lead to the identification of variables that are most susceptible to control. Thus, strategies of change can be selected that are sensitive to the relative difficulties of selectively altering constraint variables. The costs of building consensus, altering roles or speeding up analysis can be made more explicit. Once the potential effectiveness of decision processes and change strategies are analyzed, based on an analysis of constraints, then a clearer focus on trade-offs between values associated with particular decision process paradigms should result in more informed and, hopefully, more effective choices. Policy making is not a process of maximizing a particular value but of reconciling conflicting values.

Whatever the validity of the foregoing assertion, the evidence of a debate over the legitimacy and effectiveness of the two decision paradigms suggests that the time has come for a reassessment of the normative assumptions that lie behind planning, cost-effectiveness analyses, and the associated campaigns for accountability and evaluation. At the same time, the limitations of fragmented, uncoordinated decision processes need recognition. Some of the current enthusiasm for a return to market decision strategies, which emphasize autonomy and independence, need to be tempered by an examination of the reasons that have led to increased planning. Changes taking place in higher education rule out a nostalgic return to the decentralized, incremental policy processes of the past. The size of the higher education enterprise, and its claim on a substantial portion of public revenues, insures a continuing public interest in coordination and efficiency. Thus, the challenge to those concerned with higher education is how best to preserve traditional values of

diversity and autonomy while satisfying increasingly significant values such as economy, efficiency and coordination. The magnitude of this task is compounded by a fundamental uncertainty in this country over the broad purposes of higher education as universal postsecondary education approaches reality (Trow, 1972).

HISTORICAL ROOTS OF DECISION PROCESS CONFLICT

Competing Theories of Social Action Processes.

Dahrendorf (1968) examined the historical value conflicts between "two types of rationality" - market and plan:

> One (the market) is the liberal pattern. In liberal thinking, rationality is a quasi-economic term. It seeks a maximum yield at a minimum cost -- for example, a maximum of individual happiness with a minimum of political decision. The social order rests on the assumption that this kind of rationality guides the individual as well, so that as a rule people will not systematically act against their own interest. It is further assumed that every increase in the rationality of the political process will necessarily increase the utility of this process for the people involved. According to this view, then, if social forces are simply allowed to take their own course, they will produce the best possible political solutions at any given time. (p. 217)

> The plan-rational orientation, by constrast, has as its dominant feature precisely the setting of substantive social norms. Planners determine in advance who does what and who gets what. The ideal plan-rational orientation leaves no room at all for individual decisions, or indeed for conflicting decisions. Instead, the plan -- assuming it is benevolent -- successfully anticipates all needs, prescribes the means of satisfying them, and relates ends and means unambiguously to each other. In such an orientation, rules of the game are in principle as superfluous as substantive norms are in a market-rational approach; there is no game, but merely the controlled working out of predetermined processes. (p. 220).

These two approaches to decision making correspond to the incremental/remedial and the comprehensive/prescriptive types described previously.

The roots of the I/R decision process lead back to the classical liberal formulations of the market place propounded by early economists, particularly Adam Smith (1776), and to concepts of representative government described by political philosophers, such as John Stuart Mill (1859). More recently, the liberal formulation of social action has been supported

by Hayek (1944) and Friedman (1962).

The concept of planning, in its modern form, grew out of social philosophies seeking to find solutions to problems apparent in the liberal formulation of rational decision making. Marx (1867) described the social consequences, that he foresaw, from the growth of unregulated market economies, and the need for political intervention. Aside from the Marxists, Mannheim (1940), presents one of the most ambitious attempts to formulate the concepts of planning (Dahrendorf, 1968). He describes well the fundamental assumption underlying the C/P paradigm:

> We have never had to set up and direct the entire system of nature as we are forced to do today with society . . . Mankind is tending more and more to regulate the whole of its social life, although it has never attempted to create a second nature. (p. 175).

The philosophies of science (particularly logical positivism), provided a rationale, and scientific breakthroughs set precedents, for man's belief in the possibilities of intervention into "the entire system of nature." Science, also, furnished the technology needed to conduct planning.[2]

Growing Legitimacy of Planning: Some Speculations.

Until recently in this country, the concepts of public planning had little ideological support. Planning was closely linked in the public's mind with concepts possessing negative connotations, such as socialism and authoritarianism.[3] During the past 20 years, planning has gained considerable legitimacy among both progressives and conservatives.

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[2] Salner (1972) described the connection between the philosophy of science and modern systems and planning concepts.

[3] These liberal concerns about the values implicit in planning were set forth in classic form by Hayek (1944).

Galbraith (1967) makes the case for planning in modern industrial society, and recently a conservative president, Richard Nixon, with considerable public approval, employed the most extensive economic controls in the history of the country. In higher education there has been a rapid growth of statewide coordination and planning (Glenny, 1959; Berdahl, 1971). Balderston and Weathersby (1972) note the growth of PPBS in higher education. The rapid expansion and influence of the National Center for Higher Education Management Systems (NCHEMS) further attests to the growing interest in planning in higher education (WICHE, 1973).

Complex and obscure factors undoubtedly lie behind the rapid legitimation of planning in higher education. Some of the factors appear to be:

- the growth in the size and complexity of higher education,
- the rapid rate of change in society and higher education,
- the "success" of science in explaining complex phenomena,
- the development and elaboration of the technology needed to plan,
- shortcomings perceived in the operation of the political marketplace.

The growth in size and complexity of higher education. Trow (1972) describes the exponential growth of higher education and the functional transformations accompanying transitions from "elite" to "mass" to "universal" access. From 1889-1890 to 1953-54 the income of institutions of higher education, in relation to GNP, increased from 0.23% to 0.63% (Harris, 1972). This growth in size, both absolutely and in relation to a percentage of GNP, has produced pressures to coordinate the efforts

of institutions and to contain their demands for money, particularly during the rapid growth of the past decade. Higher education has come to be more and more interrelated, and policy decisions of one institution increasingly hold implications for other institutions. This growth also has resulted in an increasing competition for funds with other public programs, such as welfare (Glenny and Kidder, 1973). Growth has not been limited to enrollments. Many writers, including Kerr (1964) and, more recently, Ashby (1971), have noted the increasing number of missions taken on by universities. These missions sometimes compete with one another, and this internal competition generates pressures for more cohesive planning. The expanded research functions of Universities is widely thought to have resulted in a deterioration of the teaching function. The conditions accompanying government sponsored research has conflicted with traditional modes of academic inquiry. Conflicting missions are spawning proposals to "unbundle" higher education by spinning off functions such as certification (Newman, 1971). Institutions are divesting themselves of research functions. Growing financial demands have led to increased federal and state involvement in higher education. The resulting concerns for public accountability have given impetus to planning. For example, the Federal investment in buildings for higher education institutions in 1963 was accompanied by an insistence on statewide planning. The growing financial crises in higher education generally (Cheit, 1971), and in private education in particular (Jenny and Wynn, 1971; Jellema, 1972) have further favored increased state financial support accompanied by increased governmental intervention and planning. Expanding efforts to articulate new forms of post-secondary education with traditional programs are likely to place an even greater

emphasis on planning and coordination.

The accelerating rate of change. There is little need to document the dramatic acceleration of the rate of change in society and education. The implications of the increasing rate of social change are of such interest that a book on the subject, entitled Future Shock, has become a best-seller (Toffler, 1970). New institutions are emerging concerned with predicting the shape of the future and terms such as "inventing alternative futures," and creating "scenarios" have become a part of the language of administrators. Commonly, complaint is made that higher education has not kept up with the swiftly changing demands of the larger society. Insistent demands are being placed on institutions of higher education to adapt rapidly to changing needs, and to lead the search for means to predict and control the directions in which society and higher education are moving.

From another perspective, higher education is being asked to critique the value of changes that are taking place, particularly in our environment, and to devise means to restrict and control change. Differential rates of change among social institutions, and differing perceptions of the degree and nature of change in various segments of our society, has increased conflicts between individuals and institutions over their increasingly diverse goals and created an apparent loss of social consensus. This has been especially true in higher education (Trow, 1972). The effects of this lack of consensus in higher education were particularly apparent in the debates over "student aid" versus "institutional aid" in the "Education Amendments of 1972" (PL 92-318). Planning commonly is viewed as the means to deal with the uncertainties that

are associated with this rapid rate of social change.

The "success" of science. The results produced by scientific research and technological innovation during the past 150 years created a growing faith in the rational powers of man. The world view of the scientist became, perhaps, the predominant philosophic orientation of American society. Successes, such as space ventures, created confidence that technologies employed by scientists and systems engineers could be applied to the social arena resulting in solutions of contemporary problems. This faith in science appeared to reach its zenith during the 1960's. Large numbers of "systems analysts" and proponents of modern planning techniques shifted their attention from defense and business to social concerns such as education. Recently, however, a reaction against the scientific orientation of our society appears to be developing. Books dealing with metaphysical points of view have become very popular. This reaction has had its counterpart in a growing number of critiques of planning techniques and systems analysis (Kelleher, 1970; Salner, 1971; Hoos, 1972). Substantial federal cutbacks in research funds have occured since 1968. The Office of Science and Technology has been shifted from the White House to the National Science Foundation, with some loss in status. New educational finance schemes such as "voucher systems" are emerging. These lessen the need for planning, with its associated centralized coordination and control.

The development of planning technology. Planning has become more feasible with the development of hardware and techniques for storing and manipulating large bodies of data. The computer has been at the center of this development. It has made the large scale analysis of

data practical by using applied mathematical tools of operations research and decision analysis. Further techniques that have facilitated planning are PPBS, various forms of network analysis such as PERT, and Delphi techniques. The very presence of this planning capability, some suggest, has led to the use of these techniques in situations where they are inappropriate (Hoos, 1972). Jones (1973) suggests that the utopian urge in our culture has become a utopianism of means rather than ends. Our large scale visions have become technological rather than philosophical. Perhaps it is this fascination with technological means that has created a climate of acceptance for the extravagant claims of some planners.

The shortcomings perceived in the political marketplace. The classical formulations of the political and economic marketplace as a vast self-correcting mechanism have been questioned severely during the past half-century. The tendency of economic and political power to concentrate in a few hands, as well as the conflict between the goals of individuals and organizations, together with the unforeseen impact of individual actions on others in an interdependent society, and the need for public services unmet when left to market incentives (Olson, 1968), all have led to a search for ways to conduct human affairs that are more in accord with the collective interest than are the diffuse individual interactions of the marketplace. At the same time, there has been a growth in the tendency to view social problems as emanating from the structure of society itself rather than arising solely from the willful behavior of individuals. Thus, planning to restructure society is viewed increasingly as a legitimate, and possibly effective, means to deal with man's problems.

Conclusions. In the past, institutions of higher education performed a role less central to the everyday functioning of society. Institutions were smaller, more autonomous, and faced less pressures for rapid change. Policy decisions in this less interdependent society affected fewer people and fewer organizations, and therefore decisions could be made with less analysis. Guidelines of tradition were reasonably effective, and the undesirable side effects of decisions could be corrected with relatively little economic and social cost.

Today, the rapid rate of social change, a lower level of social consensus, and the growing importance of knowledge generation and diffusion in our society requires more planning. The "success" of science gives hope that it will be an effective method for solving problems. Size, complexity, and an accelerating rate of change have made the consequences of decisions in higher education far-reaching in several respects. Rising costs of maintaining institutions, and systems of institutions, have placed a higher value on efficiency and accountability than was true in the past. Consequently, the practice of formal evaluation has become more pervasive. Rationales are sought to improve the criteria for allocation of funds and thus to reduce conflict by making allocation decisions on more "objective" grounds. Additionally, the speed of change, both internally and in the environment of higher education institutions, requires an improvement in predictive ability to protect large "sunk costs," and to avoid increasingly expensive modifications of operations. Increased interdependence and complexity, externalities or side effects, and unanticipated consequences resulting from decisions have heightened the need for analysis and prediction.

Conflict Over Decision Process Selection: Recent evidence.

The growing acceptance of the *legitimacy* of planning has changed the nature of the debate between advocates of comprehensive/prescriptive processes and proponents of incremental/remedial decision processes. Recent arguments have focused increasingly on the *effectiveness* of planning; particularly the use of new management technologies such as systems analysis and PPBS. Lindbloom (1959) introduced his "muddling through" decision model. He and Braybrooke (1963) elaborated this incremental view of decision-making. Wildavsky (1964) examined the federal budget process and found that decisions were made largely according to traditional incremental political processes. He also criticized the effectiveness of cost-benefit analysis, systems analysis, and program budgeting (1966). Hirschman (1970) described the remedial nature of policy-making, a central concept in the I/R view of the decision process, Niskanen (1972) described the Federal experiment with PPBS and the reasons why it was abandoned. Kelleher (1970) and Hoos (1972) contributed critiques of the assumptions that lay behind the use of modern planning techniques. More specifically related to higher education, Balderston and Weathersby (1972) prepared a critique of the attempt to implement PPBS at the University of California. Heim (1972) discussed problems faced by the National Center for Higher Education Management Systems in the development of its planning tools and techniques. Bowen (1973) questioned the assumptions that lie behind the concept of accountability.

This criticism of formal planning strategies has roughly paralleled the development of Program Planning and Budgeting Systems (PPBS), the

principal technique employed to impelement comprehensive planning in public agencies. Only recently, however, with the growing disillusionment over the failure of PPBS to live up to the expectations of its proponents, has this criticism appeared to have much impact on the consciousness of policy-makers. Concepts of formal planning are highly elaborated, and planners have developed their own vocabulary; while employing quantitative and computerized forms of analysis that have great appeal to a science-oriented society. The strength of the planning ideology is such that it is commonly viewed as the "rational decision process," with the implication that traditional decision processes are irrational. This may be because the elements of the incremental decision process have not been defined as well as those of the planning process. Most formulations of incrementalism are by political scientists or sociologists whose disciplines, perhaps, lack the status of economics and applied mathematics, whose representatives are the principal theoreticians among plan advocates. Yet, as noted by Schultze (1968), a large proportion of Federal budget decisions are made on the basis of traditional, incremental political processes. The wide-spread resistance to rigorous planning and the equally pervasive presence of I/R decision processes suggests that these processes serve functions unmet by C/P decision processes.

TWO DECISION PROCESS PARADIGMS

The Comprehensive/Prescriptive Decision Paradigm: An examination of planning.

The C/P paradigm is largely described in the literature of planning. The C/P paradigm might be termed accurately the planning paradigm. Planning has been defined and related to other organizational functions by Eide (Elam and Swanson, 1969):

> Education (or any other field of policy) may be regarded as a conventionally defined set of variables, linked together by definitional relationships or by covariance, which at least in principle may be empirically estimated . . . *Planning* . . . [is an] operation with a model in which, a priori, neither input nor output variables are given . . . the result of such an exercise can only be the identification of various consistent sets of values of input -- and output -- variables. The consistency checking implied would constitute the essential element in planning. [p. 78]

Among the concepts Eide lists as critical to understanding planning are:

Decision-making: Fixing of values of output variables;

Programming: Estimating the values of input variables when the values of output variables are given;

Implementation: The practical manipulation of input values according to an established program;

Control: The checking of whether values of coefficients describing structural covariance correspond to expectations;

Research: The systematic study of structural coefficients within one model, including the developing of theories about the determinants of such coefficients;

Forecasting: Estimating the values of output variables, when the values of input variables are given (reversing the programming process). [p. 79]

Eide regards programming as a special case of planning and asserts that in practice implementation implies a certain amount of programming. The control function provides essential information on changes in basic assumptions; research provides necessary knowledge about the values of structural coefficients within a planning model. From the viewpoint of a policy-maker, according to Eide, "planning provides the raw material for decisions in terms of clearly formulated priority choices and alternative lines of action, their implications worked out and explicitly stated." Eide evidently would consider policy formulation as the process of selecting a course of action from among alternative plans. He acknowledges the considerable interaction between policy-makers and planners that may result in the emergence of only one plan, but sees two sets of actors with different functions which, organizationally, should be kept distinct.

These definitions are based on economic concepts of input, process cess and output models and are derived from systems theory (Lockwood, 1972). Their application to higher education has been primarily through the development of PPBS and planning techniques such as those designed by the National Center for Higher Education Management Systems and the Systems Research Group. Weathersby and Weinstein (1970) describe the characteristics of several mathematical models designed for higher education planning.

PPBS was developed principally by the RAND Corporation and its probably best represented by the work of Hitch and McKean (1960), Schultze (1968) and Novick (1969). PPBS is a form of analytical decision-making which calls for the specification of objectives and incorporates cost-effectiveness analysis to find the most effective

and efficient ways to reach desired goals on the basis of objective criteria. The objectives of PPBS are sixfold (Schultze, 1968):

1. To broaden the range of alternatives considered in policy and program design, and to enlarge the scope of the policy-maker in seeking program objectives.

2. To analyze the output of a given program in terms of its objectives.

3. To measure total program costs, including both the future budgetary consequences of current decisions and other more indirect social costs.

4. To formulate objectives and programs which extend beyond the single year of the annual budget submission.

5. To analyze the alternative to find the most effective means of reaching basic program objectives and to achieve these objectives at the minimum cost.

6. To establish these analytic procedures as a systematic part of the budget review.

One of the many arguments for PPBS is that yearly budget decisions are so constrained that there is little room permitted for change. A longer range perspective allows for more significant changes in objectives, operating practices, and budget allocations. PPBS allows room for major changes by calling for reviews of the basic structure of programs rather than allowing incremental additions to, or deletions from, existing ones. In addition, it is logical to expect that a simultaneous review of all competing programs will be much more equitable than a process which looks at programs individually. This is especially true if detailed information is available on the analysis of program objectives, effectiveness, and costs.

The concept of accountability often is associated closely with the notion of planning. Bowen (1973) listed the ingredients of a system of

accountability as:

- a clear statement of goals with an ordering of priorities;
- allocation of resources toward maximum returns in relation to the goals;
- cost and benefit analysis including allocation of costs and benefits to particular institutions and to programs within institutions;
- evaluation of actual results;
- reporting on the evaluation to governing boards, to sources of financial support -- including possibly the general public -- and also to faculty and administrative staff.

The purposes of accountability so defined are several:

- to provide justification for appropriations (placing the burden of proof on the applicant);
- to require clarification of objectives;
- to improve operating efficiency;
- to provide incentives for improved performance;
- to provide a base for relating compensation of administrative and professional staff to performance;
- to identify examples of excellent operation so that these examples may be emulated. [p. 28]

This view of accountability is clearly based on the perspective of the C/P paradigm and, as Bowen points out, rests on a number of assumptions that often do not hold for higher education. For example, the concept of stating and achieving goals is difficult to employ when the distinctions between means and ends is not clear and goals are obscure, complex and controversial.

The necessity for planning is described by Farmer (1972) as follows:

- goals are required to guide the direction of change;
- management is required if the process of change is complex;
- cost/benefit comparisons are required if resources are limited;
- cause and effect analysis is required if specific end results are desired;
- an analysis of investment is required if the management of change entails differential risks;
- a defensible system of decision-making is required if the enterprise entails controversy and accountability.

This formulation sets forth the logic for planning but contains the familiar assumptions that goals can be specified and weighted, cause and effect is subject to understanding within the bounds of available resources, and the processes of planning can be conducted in ways that are considered legitimate by those affected.

From the foregoing discussion it can be seen that the comprehensive/prescriptive paradigm rests on a number of assumptions about the nature of the environment in which it takes place. These assumptions include:

1. The technical analysis of problems, goals and change strategies produces sufficient understanding and agreement to permit the establishment of goals and priorities. This implies that conflicts are based principally on lack of understanding rather than on fundamental disagreements over values and self-interests.

2. The area subject to planning is sufficiently understandable so that crucial causal relationships can be determined, technologies for change can be developed, and outputs can be identified and measured. If the nature and relationships of crucial variables are obscure then research and development are necessary prerequisites to planning (Rivlin, 1969).

3. The economic, social, human and information resources necessary to design, implement and evaluate plans must be available. If the money, the ideological commitment, the human talent and the information technology are inadequate, planning will, to that extent, be inadequate.

4. The rate of change, deadlines, and competing priorities in the

environment must allow sufficient time for the analysis that is the essential element in planning.

5. The consequences of planning must serve positively the functional requirements established by the roles of key actors. If the consequences of planning are to reduce prematurely the options available to policy-makers then they are highly likely to resist planning. Rivlin (1969) presented evidence of this problem in her analysis of the experience with PPBS in the Department of Health, Education and Welfare.

The incremental/remedial decision process paradigm does not require that these assumptions be met. In a sense, it is a method for coping with high levels of uncertainty and conflict that are not easily solved by organized analysis.

The Incremental/Remedial Decision Paradigm: An Examination of Traditional Liberal Decision Theory.

The I/R paradigm, as noted earlier, has grown out of the liberal theories of social action and market economics that have been developed over several centuries. Mannheim (1950) describes the elements of this theory as follows:

> The liberal theory of social action may roughly be stated as follows: There is no need for planning, no need for being told what is the right way of action, no need for special inculcation of aims or stimulation of motivation so long as there is (a) opportunity for everyone; (b) free choice; (c) scope for experimentation, for trial and error by the individual; (d) available information about the relevant facts; (e) last but not least, free competition, which in connection with the previous factors will create both the incentives and the necessary wisdom to adjustment.

This theory of decision-making underlies the analysis of political systems and organizational budget processes by Lindbloom (1965), Braybrooke and Lindbloom (1963), Wildavsky (1964), Fenno (1969), and Crecine (1969), all of whom are often termed incrementalists. Hirschman (1970),

an economist, also approaches decision-making from this perspective. This school of thought concentrates on how the individual policy-maker operates within an ongoing political system. In stressing the parameters of individual choice, this perspective assumes an environment which necessitates a continuous, gradualist approach to decisions. Incrementalism, as a systematic strategy for decision-making, has eight interrelated attributes (Braybrooke and Lindbloom, 1963):

1. Choices are made in a given political system, at the margin of the status quo.

2. A restricted variety of policy alternatives is considered, and these alternatives differ only incrementally from existing policy.

3. A restricted number of consequences are considered for any given policy; at any one point the analysis of consequences is quite incomplete.

4. Adjustments are made in the objectives of policy in order to conform to given means of policy, implying that ends and means are chosen simultaneously.

5. Problems are reconstructed, or transformed, in the course of exploring relevant data.

6. Analysis and evaluation occur sequentially, with the result that policy consists of a long chain of amended choices.

7. Analysis and decision-making are remedial; they move away from negatively perceived situations and toward known objectives.

8. Analysis and decision-making are socially fragmented; they go on at a very large number of separate points simultaneously.

The central premise of the incrementalist view is that it is difficult to specify the ends or objectives of public programs and virtually impossible to separate ends from means (Lindbloom, 1959). In other words, ends or goals are being constantly explored, reconsidered, and discovered, and are usually in conflict with one another. It is

politically unrealistic, for example, to technically maximize some known social welfare function, that is subject to a given set of production functions and resource constraints, because there is such a wide network of conflicts over values, even in low-level decisions.

Incrementalists further assume that it is difficult to predict consequences that will result from the employment of any particular means in order to achieve the wide spectrum of end objectives and values that are normally present in any social setting. The connections between cause and effect cannot be unraveled by prior analyses. For this reason, and the fact that political decision costs rise with higher levels of value conflict among decision-making units, incrementalists feel that choice typically represents gradual movement away from problems rather than attempts to reach given objectives. Incremental steps reduce the political opportunity costs of any decision, for the political resources expended to secure the agreement necessary to pursue one line of action will not be so costly as to reduce or preclude the opportunity to pursue other lines of action (Wildavsky, 1966).

The I/R decision-making process can, in a sense, be considered more "efficient" than the analysis called for in PPBS. Realistically, the individual analyst or analytical group cannot evaluate <u>all</u> the consequences of <u>all</u> the alternatives proposed to satisfy <u>all</u> the values held by the various groups in the decision-making process. In fact, simply the identification of consequences, alternatives and values is far beyond human capabilities in even relatively simple situations. Consequently, incremental decision theorists emphasize the advocacy process as a means of reaching decisions. Their view is that relevant consequences of decisions will be discovered most efficiently when advocates

of every significant interest group are allowed to present and defend their desired alternatives.

The particular virtures of the I/R paradigm, based on this analysis, seem to be its feasibility in circumstances that do not fit the assumptions of the C/P paradigm. The I/R decision process has the following characteristics and merits:

1. The paradigm assumes the presence of conflict over values, problems, goals, change processes, ideologies, and expectations. The decision process diffuses and decentralizes these conflicts and operates on the basis of mutual accommodations. Focusing attention on individual actors, rather than on central planners, creates a sense of the difficulties of social change and tends to inhibit utopian, revolutionary aspirations. If decision-making is a collective uncoordinated process then a change in leaders is a not a completely effective solution to social ills. Change is a structural and educational process as well.

2. The paradigm does not assume that the nature of a policy area must be understood prior to decisions. The nature of policy areas is discovered through reactions to decisions and actions and, therefore, the process is remedial. Less information has to be collected and analyzed centrally if those who initially possess the knowledge are also relevant decision-makers. There is explicit recognition that information is a resource, subject to exchange in the marketplace, and is not freely provided to policy-makers.

3. The paradigm does not require the centralization of analytical resources and decision power. The question of whose goals are to be served is resolved by political bargaining processes, not by central authority.

4. The paradigm recognizes limitations of time and locational perspective placed on analysis. Each actor is permitted to "satisfice" (Simon, 1947) in terms of the complex set of trade-offs unique to any particular circumstance. Inconsistency is permitted and controlled through bargaining, thus providing for conflicting values and experimentation in the face of uncertainty. The self-interests and limited perspectives of individuals, as a result of their locations and roles in the organization, bring out the consequences of choices and are not solely viewed as obstacles to change since consistency is not an overriding requirement.

5. Accountability is maintained through bargaining arrangements

> between individuals. Central policy-makers are not held accountable for matters over which they have no control. The diminished role of central policy-makers reduces the distance between those who make significant decisions and those who are affected by them; thus increasing sensitivity to the problems and desires of all parties. Freed from the inevitable uniformity of centrally developed policies, easier and more responsive accommodations to local circumstances are possible. Decision-makers possess more relevant facts and are less likely to view those affected by their decisions in detached and abstract terms.

Major Characteristics of the Two Paradigms: A comparison and contrast of their "ideal types."

The decision process paradigms that have been discussed can be described as "ideal types" in the sense that this term was used by Weber (1949). Such a description provides a caricature of the paradigms in that it presents their most distinguishing characteristics in their most extreme forms. In practice conditions rarely exist that permit decisions to be made on the basis of these "ideal types." However, like the concept of "perfect competition" in economics, these "ideal types" provide a framework that facilitates the analysis of what one finds in an examination of practice.

The most extreme form of the incremental/remedial decision process would be a situation in which all parties make their decisions in terms of their unregulated self-interests and, upon perceiving the effects of these decisions, make new decisions to deal with the problems revealed by the new information. No external collective sanctions would be imposed to force decisions to conform to values beyond those held by the individual. Economists have shown that an organized society is not feasible in such an environment of unfettered and uncoordinated individual decision making. The circumstances that lead to a need for constraining individual choice have been described by Olsen (1965), Hardin (1968), and Ostrom (1973). Some of the reasons that individual choice must be constrained

include:

- the need for specialization, and consequently the interdependencies in a complex modern society;
- the existence of public goods, which all can receive whether they pay or not;
- the presence of spillover effects or externalities, or the unintended effects on others of one's decisions; and
- the nature of common property resources, or resources that involve a jointness of supply and separability of use (where individuals cannot be effectively excluded from access to the supply of a resource but each individual makes a separable use of that resource).

The extreme form of the comprehensive/prescriptive decision process would be a situation in which participants make decisions entirely on the basis of perceptions of their collective welfare. Since, as was shown above, self-interest does not lead to acts that accord with collective welfare, the following conditions must be met for decisions to fully comprehend the collective welfare:

- complete knowledge of the current state of affairs must be obtained to discover those circumstances that are detrimental to the collective welfare;
- all possible relationships between ends and means must be explored to discover the alternatives available;
- specific ends, and measures of their attainment, must be defined and agreed upon to provide the criteria for choices; and
- effective methods for attaining selected ends must be available.

Planning to accomplish these objectives is not feasible to the extent that knowledge is lacking about the current state of affairs, desired ends, and effective means, or these areas are matters of controversy. Since imperfect knowledge and controversy are nearly always the case, considerable discretion remains with individuals, even in the most thoroughly planned situations. Plans always are tentative and need constant revision. The lack of resources to do comprehensive analysis, even when such analysis is

within the state-of-the-art, means plans are stated at varying levels of abstraction and much has to be improvised by those who attempt to implement these abstractions in concrete situations. The attempt to exercise undue control leads to what McKie (1970) calls the:

> "tar baby effect," since it usually enmeshes the regulatory authority in a control effort of increasing complexity with little gain in efficiency but a growing feeling of frustration. (p. 9)

In practice trade-offs have to be made between comprehensiveness (to discover externalities and system-wide effects) and disjointed actions (to permit prompt response to problems).

Figures 1 and 2 list some assumptions about the orientation of advocates of each of the two paradigms toward (1) the environment of the decision process and (2) the values served by the paradigms. In a given policy area, it seems likely that some environmental variables listed in Figure 1 will favor employing the C/P decision paradigm, and others will favor employing the I/R decision paradigm. For instance, classroom scheduling may be easier to plan with predictable consequences than the techniques and content of instruction. Similarly, some values held by those affected by decisions will favor the C/P approach and others will favor the I/R approach. Efficiency, which requires measurable objectives, is more clearly a realistic concern when the object is a motor pool than when it is a basic research project. Basic research follows a line of inquiry and does not seek measurable objectives.

The difficult task of the policy-maker, given these dilemmas, is to determine the mix of decision strategies appropriate for each area of decision and to develop consensus on the relative weighting of value served by the use of each paradigm. A trade-off must be made between

Figure 1

THE CHARACTERISTICS OF DECISION PROCESS PARADIGMS

	DECISION PROCESS PARADIGMS	
Decision Process Orientation	Comprehensive/Prescriptive	Incremental/Remedial
Rate of change	Rapid change intensifies the problem of prediction and thus creates a need to plan.	Rapid change makes analysis complex and unreliable and plans are rapidly outdated so decision-making must be remedial.
Deadlines	The presence of deadlines requires the *a priori* analysis of events and the development of timetables in order to identify and deal with the critical variables.	The need for maintaining options and a flexible bargaining position causes decision-makers to resist committing themselves to courses of action much in advance of deadlines.
Competing priorities	Goals can be ranked and priorities established on the basis of the analysis that precedes policy choices.	Goals are obscure, can not always be ranked and priorities are established on the basis of negotiation over expressed self-interests.
Repetitiveness	Events are sufficiently repetitive and predictable to make planning feasible.	Events need not be repetitive and predictable for remedial decision-making.
Causal relationships	Relationships are known or are discoverable through analysis.	Relationships need not be known but effects are discovered through response to decisions.
Change technology	Critical variables that must be altered are controllable and a control technology is available.	Change results from incremental remedial adaptation and invention so decision processes do not depend on *a priori* assumptions about the state of change technology.

THE CHARACTERISTICS OF DECISION PROCESS PARADIGMS

	DECISION PROCESS PARADIGMS	
Decision Process Orientation	Comprehensive/Prescriptive	Incremental/Remedial
Outputs	Goals and measureable outputs are essential to assess the accomplishment of objectives.	Means and ends are determined simultaneously through bargaining. Explicit goals and measureable outputs are not essential since decision-making is remedial and incremental.
Quantification	Preciseness of expression and the manipulation of data requires quantification of variables in order to develop effective models of reality that involve complex sets of relationships.	An unsophisticated emphasis on quantification can bias analysis by too great a concentration of attention on variables that more easily can be quantified, or conversely, ignoring important variables that are not easily quantified, and by using numbers in ways that oversimplify and are increasingly divorced from the reality they attempt to represent.
Location of economic and social resources	The analysis involved in planning requires a concentration of resources in specialized analytic units.	Resources for analysis are diffused throughout organizations and centrally located units are likely to be insensitive to the complex values and circumstances throughout the organization that affect the change process.
Location of human resources	Critical decisions are made by central planners and policy-makers so top planning offices have high priority for allocations of human talent.	Critical decisions are made throughout the organization and talent is required wherever decisions are made.
Information resources	Information systems are required to support central planners and policy-makers.	Information is equally necessary at decision points located throughout the organization.

THE CHARACTERISTICS OF DECISION PROCESS PARADIGMS

	DECISION PROCESS PARADIGMS	
Decision Process Orientation	Comprehensive/Prescriptive	Incremental/Remedial
Consensus	Specification of goals, measurement of goal achievement, and analysis of causal relationships will lead to understanding and consensus.	Conflict is fundamental and inevitable and goal clarification only exacerbates this conflict so attention is given to "due process" and "rules of reciprocity" as means for conflict management.
Functions	Functional conflicts, suboptimizations, and dependencies are rationalized and resolved through clear specification of objectives and system views of problems.	Functional conflicts, suboptimizing and dependencies are resolved through "exchange" mechanisms in the "marketplace."

Figure 2

THE CHARACTERISTICS OF DECISION PROCESS PARADIGMS

	DECISION PROCESS PARADIGMS	
Value Orientation	Comprehensive/Prescriptive	Incremental/Remedial
Change/Stability	Rapid adaptation to or control of events is necessary and possible.	Rapid change is costly and has unpredictable consequences.
Certainty/Risk	Risks are reduced through analysis that leads to improved predictive power.	Risks are reduced by incremental change and remedial actions based on the expression of self-interest.
Analysis/Bargaining	Crucial facts are discovered through analysis.	Crucial facts are discovered through bargaining that takes place in response to actions.
Simplification/Complexity	Complexity is discovered and organized in ways that give it meaning through formal analysis.	Complexity is discovered by each individual reacting to his particular self-interests and adjusting to the constraints imposed by his physical environment and the interests of others.
Clarity/Ambiguity	Clarity improves the quality of decision-making.	Ambiguity aids consensus and maintains bargaining positions.
Expertise/Legitimacy	Expertise is the critical requirement for effective decision-making.	Legitimacy is the critical requirement for effective decision-making.
Consistency/Diversity	Consistent goals and strategies are necessary to achieve given ends.	Diversity avoids compounding errors when goals and strategies are uncertain.
Control/Freedom	Consistent policies require the exercise of management control.	Mutual bargaining permits individual discretion and avoids incapacitating conflict through interaction and compromise.

THE CHARACTERISTICS OF DECISION PROCESS PARADIGMS

	DECISION PROCESS PARADIGMS	
Value Orientation	Comprehensive/Prescriptive	Incremental/Remedial
Accountability/Autonomy	Responsiveness to the collective interest requires accountability to the central policy-makers who are the representatives of the public.	Responsiveness to the collective interest requires freedom to bargain at many levels with a multitude of conflicting interests.
Collective Interest/ Individual Interest	Serving the collective interest is a paramount concern.	Reconciling individual interests is a paramount concern.
Prediction/Remediation	Decisions involve large sunk costs and mistakes are costly so analysis and prediction are crucial.	Analysis and prediction are expensive and uncertain so corrections are made through a network of operational decisions.
Optimum/Satisfactory	Values can be analyzed and can be ordered so that optimum decisions are possible.	Values are discovered from responses to situations and cannot be ordered so, therefore, optimum solutions cannot be defined accurately in advance.
Cooperation/Competition	Cooperation between individuals with well-defined roles leads to efficiency.	Competition in an environment characterized by unfettered bargaining leads to efficiency.
Principles/Compromise	Values can be discovered and ranked so, therefore, principles can be defended on the basis of evidence.	Values are obscure and are determined by bargaining and compromise so, therefore, principles are elusive and are in conflict.

THE CHARACTERISTICS OF DECISION PROCESS PARADIGMS

	DECISION PROCESS PARADIGMS	
Value Orientation	Comprehensive/Prescriptive	Incremental/Remedial
Quality/Equality	Equality is maintained by the controls employed to implement plans and quality is maintained by the broad application of consistent evaluative criteria and sanctions.	Quality is maintained by the competative features of the market-place and inequality is minimized by the rules established for formal decision processes.

conflicting values. A policy-maker cannot be a "man of principle" if principle is defined as the "ideal type" of either decision process paradigm. In the pragmatic world of policy, a decision-maker is not likely to prosper if he attempts to implement, according to a narrow logic, the idealized form of either paradigm. Neither the utopia of the perfectly planned society, nor the utopia of unfettered social interaction are feasible given the variables that constrain the processes of decision. This is true of organizations such as institutions of higher education. Circumstances exist in which a C/P strategy is effective, but other circumstances may favor an I/R strategy. The policy-maker has to weigh the trade-offs, and at some point strike a balance between conflicting values. The most ingenious schemes attempt to maintain, to the greatest extent feasible, all conflicting values and to build in safeguards that forestall shifts to either extreme.

A number of authors suggest that the values embodied in the I/R paradigm are more compatible with the concepts of democracy than are those of the C/P paradigm. Hayek (1944) developed the thesis that liberal political philosophy, with value assumptions similar to those of the I/R paradigm, arose out of opposition to values of authority and control associated with monarchies and other authoritarian forms of government. Dahrendorf (1968) in his examination of this issue similarly concludes that freedom lies in the market concept of rationality and suggests, that if we err, we should err in the direction of freedom. However, when faced with a choice between the exercise of authority on one hand, and a lack of direction or anarchy on the other, there seems to be some disposition on the part of people to embrace authority. This happened in Germany, following the First World War, and in Russia, following the chaos surrounding the revolution of 1917.

Despite the dreams of anarchists and revolutionaries, uncertain conditions in the past seem more often to have resulted in leaders gaining authoritarian power than in advances in freedom and democracy. Stability and predictability, associated with a high degree of central control, when circumstances are uncertain, appear preferable to many as compared with the confusion of freedom and experimentation resulting from uncoordinated responses to uncertain events (Fromm, 1965).

A THEORY OF DECISION PROCESS SELECTION

The Environment of Decision Making: Constraints and values.

The effects of environment and values. Decision process selection is constrained to a great extent by the differing natures of policy fields.[4] This point of view has been expressed by Etzioni (1967), and Alexander (1972). Etzioni asserts that ". . . there seems to be no one decision strategy in the abstract, apart from the societal environment into which it is introduced." Alexander suggests that:

> Instead of developing decision models in general it might be more valuable to look at decision-making as a process which varies in response to the particular societal environment. (p. 325)

It then follows that:

> If the survival of a policy-maker depends, to a large extent, on the conformity of his image (Boulding, 1956) with his real environment, and if this isomorphism is reinforced by the success of his policies, one may expect some correlation between decision modes and the environments in which they flourish. (p. 329)

Thus, selection of a particular decision process is limited by the bounds set by the unique constraints present in the policy field. From an analysis of organization theory, these constraints appear to include:

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[4] A policy field is the area which a decision-maker wants to affect, and must take into account when making a particular decision. Thompson (1967) used the term "task environment" to describe this same concept.

- time and space limitations
- knowledge of the causal relationships, change technologies, and outputs in the policy field,
- the resources available for analysis,
- the degree to which there is operational consensus, and
- the role requirements and dependencies that result from functional adaptations to environmental demands.

Figure 3 illustrates the relationship between these constraints and the two decision process paradigms. The nature of the constraints is described in more detail below. It is suggested that within the bounds set by the constraints found in a particular policy field, the selection of a specific decision process is determined by trade-offs between the conflicting values described in Figure 2.

The disjointed nature of decision-making. Organizational decision areas can be shown in a hierarchical ordering based on the degree to which they are operationally specific. Such an ordering is shown in Figure 4. One might presume that in a totally rational world a decision process would, in a linear fashion:

- establish the values and ideology to be served;
- select a set of behavioral premises consistent with the ideology and values;
- use these behavioral premises to define problem states, preferred states, and change strategies;
- establish the policies needed to alter the problem state;
- select programs consistent with the policies; and
- so on down through the levels in Figure 4.

The decision-making environment suggested, however, is based on a

THE RELATIONSHIPS BETWEEN SITUATIONAL CONSTRAINTS AND TWO DECISION PARADIGMS

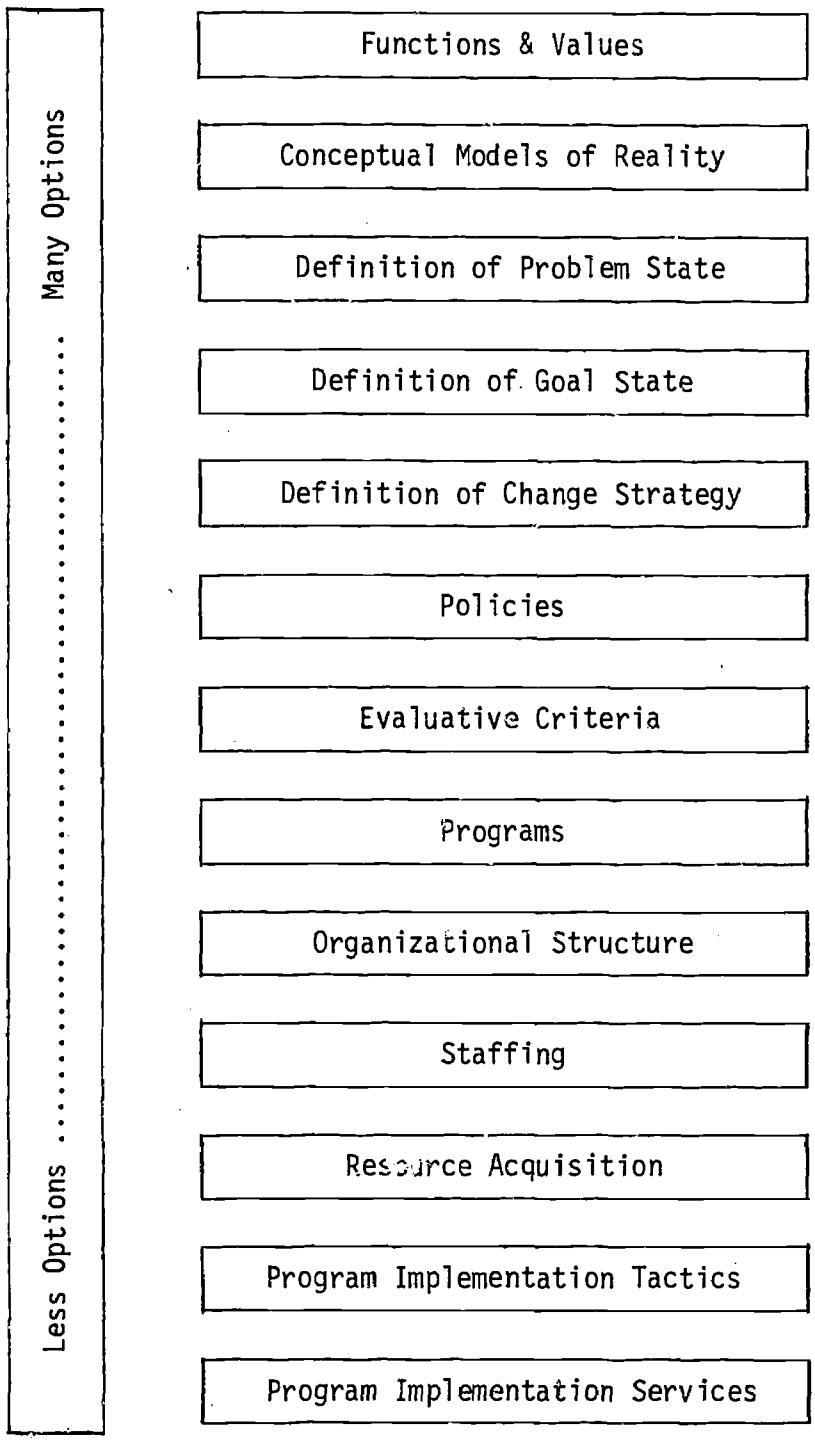
Figure 3

DECISION CONSTRAINTS

Dependent Variables / Independent Variables	DECISION PARADIGMS	
	Incremental/Remedial	Comprehensive/Prescriptive
TIME Rate of Change Deadlines Competing Priorities Repetitiveness		
KNOWLEDGE Causal Relationships Change Technology Outputs		
RESOURCES Economic Social Human Information		
CONSENSUS Values Conceptual Models Norms Expectations		
FUNCTIONS Role Requirements Dependencies		

Figure 4

LEVELS OF OPERATIONAL SPECIFICITY OF DECISIONS



contrary assumption. It assumes that decisions are made with varying degrees of independence at various levels of operational specificity, primarily as determined by *time* and *resource* constraints. Typically, there is insufficient time for full analysis of decisions and the resources needed to analyze the implications of decisions also are lacking. Rationality is thus bounded by these limitations (Simon, 1945). Subtle or even obvious inconsistencies are not discovered between decisions made by different individuals with different perspectives at the different levels of operational specificity. Constraints on rationality created by the demands of conflicting *functions*, values and ideological *consensus*, and state of *knowledge* are also slow to change since research and education are slow processes. However, improvement of knowledge is perhaps a most effective, long run strategy for fundamental change. Role definitions, the allocation of resources, and time/space or structural relationships appear more feasible areas to achieve changes in the short term.

Constraints: Time, knowledge, resources, consensus, and functions.

Constraints imposed by time. The amount of time that is available to engage in formal decision-making processes is a function of the rate of change in the policy area, deadlines placed on particular decisions, extent to which there are competing priorities, and degree to which events in the policy area are repetitive. If time constraints are severe, such as in the case when a ship sinks, or a riot erupts, then there is no time to establish and engage in formal decision processes. Decisions are made solely on the basis of previously established routines, if there are repetitive features in the circumstances, or on

intuitive information and the advice of a few trusted associates, if the emerging circumstances are unique. Depending on the particular situation, attempts are directed primarily toward controlling the rate of change or toward adapting to the emerging situation. The presence of time constraints increases the incentive to plan where past events served, to some degree, as a guide to the future; particularly if a model of the situation subject to change is sufficiently understood so that alterations and adaptative actions are reasonably effective. Rapid change particularly favors engagement in contingency planning.

Constraints imposed by knowledge. The degree to which the area subject to policy decisions is understood limits the effectiveness of decision processes. Lack of knowledge about causal relationships among the elements of a particular situation makes prediction difficult and places a premium on cautious incremental actions and continuous monitoring of the action's effects in order to make timely corrections. Fuller understanding permits risking bolder ventures where there is consensus on problems, strategies, and goals. The absence of effective technologies for change limits the effectiveness of planning even when causal relationships are understood. On the other hand, it is conceivable that there are instances where comprehensive/prescriptive decision making is feasible based on an effective technology for change even though causal relationships in the field are obscure. When outputs are difficult to identify and measure, then, to an equal degree, planning is constrained. Certain kinds of analyses illuminate a policy field only in order to better inform decision-makers and can

be performed in certain cases, but these would not be considered planning from this point of view. Rather they are an intelligence gathering function and the product is knowledge employed as a resource either for incorporation in plans, or for use in bargaining processes.[5] Planning, as defined in this paper, involves the specification of goals and programs for their attainment. The critical distinction for analytical purposes is whether the data is employed to produce a prescriptive model or as a resource in the traditional decision processes.

Constraints imposed by the availability and distribution of resources. Meltsner (1972), and Illchman and Uphoff (1971) argue that one of the shortcomings of policy analysis is the overly narrow definition of the resources that are exchanged in organizations. There are four classes of resources available to policy-makers. These are traditional economic goods and services, social assets, human qualities and skills, and information. Differing degrees of access to these resources set limits on the feasibility of employing particular decision process strategies. The first of these resources, *economic goods and services*, are the common and often the only focus of policy attention. Perhaps the recent ascendancy of economists to high policy positions has contributed to the over-concentration of attention given to this class of assets. In any case, the rules of exchange for economic resources are more highly formulated than those for the exchange of other kinds of resources. Also, people tend to deal with those matters they know best how to handle. The second class of resources are *social assets* such as status,

[5] Wilensky (1967) discusses the nature of this intelligence function.

legitimacy, authority, coercive power, and obligations. Little attention seems to have been focused on this class of resources by most policy analysts, although Homans (1961) and Blau (1964) developed exchange theories of human behavior. Since these resources are often intangible, they are neglected commonly in calculations. Important distinctions often are not made between types of social resources. David Broder (1970) in speaking of the Presidency, noted confusion over the relationship between power and authority:

> But power and authority are not identical. Authority -- particularly the authority of the presidential office -- involves the notion of legitimacy. And to establish the legitimacy of his actions, a President must have explained, and gained agreement with, his objectives. (p. A19)

The third class of resources are *human skills and qualities.* These resources are particularly difficult to subject to analysis and understanding. Nonetheless, they are an extremely important class of resources, and should not be ignored by analysts. Likert (1967) discussed the management of human resources in an organization and suggests a system of "human asset accounting." Likert's evidence appears to confirm that policies often neglect the effect of decisions on human resources. For instance, a budget action based on the concept of efficiency may have the unanticipated consequence of affecting the perceived status of the organization and the expectations of its clientele in ways that can result in an exodus of the most competent employees, since they are more in demand and, perhaps, are more perceptive of the long term consequences of the budget action. The fourth class of resources is *information.* Like social resources, people often fail to realize that information is exchanged and employed in ways designed to enhance the net

positions of persons and organizations. Considerable naïveté about this process of exchange is often involved in attempts to construct information systems. The assumption upon which the systems are based fails to provide for the fact that there is bargaining over information. Information is not freely exchanged if its diffusion adversely effects the self-interests of those who possess it. The phenomenon of the bureaucrat who, in order to protect his position, does not allow his subordinates to obtain a larger view of the operations of the organization often is noted, but is not always understood to be one aspect of the exchange process phenomenon. The typical reaction is to fault the motives of the individual, rather than to examine the factors involved in the exchange process that contribute to his behavior.

The process of planning requires the presence of sufficient resources to design and implement plans. Thus, resources are concentrated at the upper levels of an organization where the breadth of overview is sufficient to produce an effective and logically consistent plan; a plan that takes the broad interests of the collectivity into consideration. Lack of resources to assemble data, or engage in analyses, or construct blueprints for action, force decisions to be made in a decentralized and remedial fashion. When resources are concentrated, planning can result in actions that represent limited points of view and serve particular sets of interests. "Counter-planning" (Churchman, 1968) and "advocacy planning" (Davidoff, 1965) have been proposed to remedy this latter defect. These concepts imply that those in authority will provide resources for analysis to individuals and groups whose interests may conflict with their own. This seems a rather naïve point

of view, although it can be argued that this was exactly the reason for the creation of the Office of Economic Opportunity.

Constraints imposed by the degree to which there is consensus in the policy field. Disagreement can occur over the definition of problems, the definition of goals, and the selection and implementation of change strategies. Such disagreement results from the diverse values employed as criteria for choice, differing conceptual models employed to analyze events, different standards and norms of reciprocity, and varying expectations held by people. Disagreement also results from access to different sets of facts. This problem of partial perception is illustrated by the classic parable of the blind men examining the elephant, each of whom describes its characteristics differently as a result of being in contact with different parts of the beast. In organizations people at different levels have access to different sets of facts. Often it is thought that most, or many, organizational problems result from lack of information. The consequence of this assumption is the selection of strategies for change that fail to recognize that there are also fundamental, underlying disagreements producing conflict. Group encounters and better information flows will not produce agreement if the conflict is over basic self-interests, ideologies and values. Techniques employed to maintain or gain consensus in the face of fundamental conflicts include:

- discussing policy at a level of generality sufficiently high to blur disagreement,
- having a secret plan (Benveniste, 1970),
- focusing on operational details rather than on broader issues of policy, and

- setting up "due process" methods of decision-making that leave goals to be ironed out along the way through bargaining, voting or similar techniques.

Goal setting is difficult, and often dysfunctinal, when there is a lack of consensus in a field of policy. This lack of consensus restricts the use of the C/P decision process.

Constraints imposed by conflicting functional demands. Different roles played by actors in an organization place restrictions on their behavior. For instance, a budget officer is concerned with efficient allocation of resources and his life is easier if his clients do not make demands for large increments of additional funds. On the other hand, deans lead a happier existence if they can support a variety of faculty activities and can respond to new initiatives without abandoning old programs. The budget officer is rewarded for keeping a close eye on economy, the dean for building a stronger (more expensive) department. Setting goals, establishing program priorities and seeking efficiency are appealing to a budget officer. Experimentation, diversity and breadth of program are appealing to the dean. Planning by his clients that serves to justify his decisions, therefore, is likely to be favored by a budget officer. Incremental decision processes that provide flexibility are likely to be favored by a dean. On the other hand, an institutional budget officer, looking toward the state budget agency, is not likely to favor being made the object of prescriptive requirements. Planning that reduces the flexibility and adaptability with which he meets contingencies and serves his clients is dysfunctional. There is slack in organizations (Cyert and March, 1963) that gives them discretionary resources and flexibility to adapt to new

circumstances. Planning and efficiency-seeking result in a reduction of this slack. Consequently, there is a reduction in the organization's ability to adapt to contingencies. Its margin for error is smaller.

Conclusions. The analysis of these constraints suggests that differences in the presence of constraints determines the bounds within which the two decision paradigms are feasible. Policy-makers often fail to consider the full range of resources to which they must be sensitive in order to avoid impractical or disastrous courses of action. The I/R decision paradigm appears to have greater sensitivity to the full range of resources and other constraints present in higher education because decisions are located closer to the circumstances that generate the need for action. Compression of information, data distortion, and a press for quantification, needed to permit central figures to assess the "big picture," associated with the C/P paradigm, is not so essential to the I/R process of decision. Nevertheless, in all organizations some means must be present to reconcile the data describing broad effects and collective interests possessed by those at the top of the hierarchy with the more detailed, particularistic data possessed by those at the base of the organizational pyramid.

THE GAP BETWEEN NORMATIVE ASSUMPTIONS CONCERNING DECISION PROCESS SELECTION AND THE REALITIES OF THE HIGHER EDUCATION ENVIRONMENT

Effects of the Gap: Confusion over operative constraints and values.

The C/P decision paradigm appears to be more consistent with the ideological assumptions held by the majority of the policy-makers in higher education at state and system levels. This is evidenced by the growth in planning, coordination and evaluation. The characteristics of the constraints found in higher education, however, generally appear to be more compatible with the assumptions of the I/R paradigm. A gap, therefore, can be expected between the normative assumptions of high level policy-makers and the actual decision processes that are employed as a result of the decision constraints. The perception of this gap between the normative ideal and actual practice could be the reason for the current emphasis on accountability, evaluation and auditing that seeks to control willful individual behavior and thus reduce the distance between practice and the ideal. However, the disparity between the normative ideal and practice are not likely to be resolved by attempts to modify the willful behavior of individuals since, as Etzioni (1972) notes, attempts to directly influence people's values and attitudes is extremely difficult and costly. Behavior can be influenced more easily by altering environmental, social and physical decision constraints. The gap between norms and practice also has led to the emerging critiques of PPBS and other systems planning approaches. These critiques,

unfortunately, have tended to criticize current planning without presenting alternatives to policy-makers who are faced with the newly emerging problems that demand attention. A return to "muddling through," and the ways of the past, do not serve as sufficient guides for those who must deal with the demands on higher education.

A policy-maker in higher education must be sensitive to the constraints in areas of policy-making, and to the values affected by his selection of a decision process. The selection of values is not an either/or proposition. Trade-offs are involved and the points of trade-off appear to shift with time. An example of this dilemma can be found by examining one sensitive policy issue.[6] Planning to increase the proportion of minorities in higher education may involve imposed quotas. Quotas conflict with the values of flexibility, academic freedom, and advancement on the basis of quality. Thus a policy-maker has to establish the relative value of equality as against quality and academic autonomy. These values can be contradictory in theory but must be reconciled in practice. A search is required for a policy that results in the least loss in equality while preserving the greatest amount of opportunity for quality and adaptability. The answer in practice is neither planning nor reliance on the market but some judicious mix of the two. The wise policy-maker finds the most acceptable mix of these two conflicting approaches. The nature of this value conflict is such that fundamental problems are not likely to be solved, as Cohen et al (1972) notes, but are likely to recede and reappear, shifting from one decision situation to another, and producing a constant tension in organizations.

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[6] An extensive discussion of this issue is contained in the report of the Carnegie Commission on Higher Education entitled: Quality and Equality: New Levels of Federal Responsibility for Higher Education (1970).

Examples of the Gap: Policy confusion.

Contemporary literature on higher education policy often fails to recognize both the constraints on the selection of policy processes and the nature of the value conflicts involved in operational choices. A few examples that illustrate this point are described below.

1. The Carnegie Commission on the Future of Higher Education, in its report "The Capitol and the Campus: State Responsibility for Postsecondary Education" (April, 1971), recommends in a "checklist of planning considerations" that, to the extent possible, state plans contain a statement of goals and quantification of goals. The report also recommends that states broaden their responsibilties to encompass all postsecondary education. At the same time, the Commission expresses concern over the growing dominance of governors on higher education matters. The inconsistency implicit in these statements is dealt with inadequately in the report. The logical connection between control and planning is not addressed, nor is there sufficient exploration of the proper balance between levels of coordination and institutional adaptability. The tendency of planning to centralize decision-making is a crucial consideration, but the document, dealing more with the need to plan for diversity, neglects to note that the seeking of efficiency associated with planning commonly leads directly or indirectly to a reduction of diverse activities. The interesting question is whether diversity is better served by planned specialization or by sensitivity to the social demands of the marketplace.

2. The Joint Committee on the Master Plan for Higher Education of

the California Legislature (1973) recommends that:

> The legislature shall adopt a statement of legislative intent articulating broad statewide goals for California post-secondary education. (p. 3)

At the same time, the report calls for abandoning the "master plan" concept in favor of continuous planning. On one hand the Joint Committee wants a legislative mandate to give direction and consistency to the state's programs in post-secondary education. On the other hand, it recognizes the rapid changes that require continuous planning. A relatively precise statement of goals by the legislature would create a risk of inflexibility and could turn out to codify outdated perceptions. Highly generalized goal statements would provide little direction for those throughout the state who participate in post-secondary education decisions. Resolution of this conflict is one of the key problems faced by the legislature, but the issue is not treated explicitly in the report, although to a certain extent some resolution is implicit in the report's specific recommendations. Lack of explicitness is, perhaps, a useful strategy to gain adoption of the report. If the neglect, however, is due to a lack of sensitivity to the issue, then chances are great that choices will be made that have undesirable consequences.

3. In a study of the cost/income squeeze in higher education, Cheit (1971) speaks of the need for institutions to set priorities and to "have a set of purposes -- purposes that the supporting public can understand and defer to." This prescription for the financial problems of institutions fails to adequately recognize both the limitations that a lack of consensus places on setting goals, and the source of conflicts over goals. It does not help the president of an institution to recommend

that he clarify his purposes, if there is fundamental conflict over the validity of these purposes. It is even less helpful, if the lack of consensus, or purpose, in the institution is a reflection of the lack of agreement on priorities and purposes in society at large. A more basic understanding of fundamental conflicts, and processes by which such conflicts are resolved in a democratic society, would be of more help to the institution in plotting courses of action.

4. Bowen and Douglass (1971) attempted to determine the "comparative instructional costs for different ways of organizing teaching-learning in a liberal arts college." They concluded that:

> We have no factual evidence about the effect of changes in mode of instruction upon quality or effectiveness of education. We have only our own judgments, and anyone else is entitled to make different ones. (p. 98)

Nevertheless, they assert that ". . . nothing but good could come from simplification of the curriculum." Their entire analysis rests on this unsupported assumption. They do recognize the obstacles posed by the lack of understanding of the teaching process and suggest that overcoming these obstacles to reform be given the highest priority. In the short run, however, their solution is not cautious experimentation but "motivating the faculty along constructive lines." Presumably the definition of what is constructive is left to the authors since there is no empirical data to suggest efficient courses of action. If the hypotheses put forth in this paper are accurate, regarding the constraints that affect decision processes, then rapid curriculum change is likely to be a highly risky process, and a focus on changing faculty attitude is unlikely to be an effective strategy for reform.

5. June O'Neill (1971) in a discussion of productivity in higher education describes problems involved in measuring outputs stated as credit hours. Leaving aside the issue of the usefulness of credit hours as a sole output measure, she lists two problems that bias this measure:

> (1) The number of credit hours has not been accurately counted and (2) change in the quality of credit hours has not been adequately measured. (p. 49)

She does not mention the lack of comparability between credit hours given in different institutions. Despite these apparently overwhelming limitations, O'Neill goes on to state:

> . . . this area needs systematic and objective empirical studies that try to compare cost differences and productivity change differences among educational institutions producing similar outputs . . . (p. 53)

Given the weaknesses of output measures, the terms "objective" and "similar" hardly seem justified. Following the logic of O'Neill's argument, it would appear that little useful work can be done until the development of acceptable measures of outputs. Accepting the assumptions of the C/P approach to decision making, research is needed before empirical studies comparing cost differences and productivity changes are feasible. From the logic of the I/R approach, even if the outputs of higher education can be measured -- an open question -- the conflict over which set of outputs is desirable will frustrate decisions primarily based on a criterion of efficiency. Inconsistencies imposed by pursuing conflicting goals (outputs) is a variety of inefficiency that is considered essential to preserve diversity and experimentation in higher education. It is true that this diversity must be confined

within the bounds of available funds, but O'Neill apparently fails to fully appreciate the dilemma inherent in this conflict.

SUMMARY

A conflict is underway in higher education over the legitimacy and effectiveness of two modes of decision-making. These modes of decision-making are termed the Incremental/Remedial and the Comprehensive/Prescriptive decision process paradigms. For purposes of analysis these decision process paradigms can be compared and contrasted as "ideal types." Traditionally, the modes of decision-making associated with the I/R paradigm have been most ideologically compatible with the dominant philosophic orientation of American society. Recently, however, the ideology of the C/P paradigm has gained ascendancy among policy makers. Both of these decision process paradigms have limitations, when considered as "ideal types." Decision-makers, therefore, are faced with the dilemma of finding the proper mix of these two modes of decision making in any given set of circumstances.

In higher education today the dominant orientation of policy-makers is toward the C/P paradigm. However, the conditions set by the environment in which higher education takes place and the traditional values associated with higher education are more compatible with the use of the I/R paradigm. Consequently, despite the belief in the efficiency of the C/P paradigm and the use of planning rhetoric, a high proportion of decisions in higher education are made on a disjointed, incremental, remedial basis. A gap thus is visible between a C/P ideology and I/R practices in higher education. The attempt to close this gap has resulted in an increase in evaluating, auditing, centralization of

decision-making and increased attention to accountability. This response to the gap between expectations and performance of the C/P decision processes will fail because it does not deal with the basic constraints that affect the success of decision processes. In fact, a focus on the willful behavior of people, which is the usual object of auditing and attempts to strengthen accountability, is probably particularly ineffective since people's values and ideologies are highly resistant to change. A number of people are now beginning to question the broader assumptions that lie behind concepts of efficiency, accountability and comprehensive planning. A new approach to policy formulation is needed in higher education that takes into consideration the constraints that affect the legitimacy and effectiveness of decision strategies and is sensitive to inevitable value trade-offs. Somehow policy makers must attempt to make both the right decision and to make the decision right.

BIBLIOGRAPHY

Alexander, Ernest R., "Choice in a Changing World," Policy Sciences (3). Amsterdam, The Netherlands: Elsevier Publishing Company, 1972, pp. 325-337.

Allison, Graham T., Essence of Decision: Explaining the Cuban Missile Crisis. Boston: Little, Brown & Co., 1971.

Audits Division, Department of Finance, "The Management and Operations of the University of California: The Library System of the University of California," Vol. I, Parts I and II, State of California, February 1972.

Balderston, Frederick E., and Weathersby, George B., "PPBS in Higher Education Planning and Management: From PPBS to Policy Analysis," Ford Foundation Program for Research in University Administration Paper P-31, University of California, Berkeley, May 1972.

Benveniste, Guy, Bureaucracy and National Planning: A Sociological Case Study in Mexico, Praeger Special Studies in International Economics and Development. New York: Praeger Publishers, 1970.

Berdahl, Robert O., Statewide Coordination in Higher Education Washington, D.C.: American Council on Education, 1971.

Blau, Peter M., Exchange and Power in Social Life. New York: Wiley, 1964.

Bowen, Howard R., "Holding Colleges Accountable," The Chronicle of Higher Education, Vol. VII, No. 23 (March 12, 1973), p. 28.

Bowen, Howard R., and Douglass, Gordon K., Efficiency in Liberal Education: A Study of Comparative Instructional Costs for Different Ways of Organizing Teaching-Learning in a Liberal Arts College, Carnegie Commission on Higher Education. San Francisco, California: McGraw-Hill, 1971.

Braybrooke, David, and Lindbloom, Charles E., A Strategy of Decision: Policy Evaluation as a Social Process. New York: The Free Press, 1963.

Broder, David S., "Opportunity for Nixon," The Washington Post, (Tuesday, December 1, 1970), p. A19.

California Legislature, "Report of the Joint Committee on the Master Plan for Higher Education," (draft) Sacramento, California: February 1973.

Carnegie Commission on Higher Education, The Capitol and the Campus: State Responsibility for Postsecondary Education. Hightstown, New Jersey: McGraw-Hill, 1971.

Cheit, Earl F., The New Depression in Higher Education, Carnegie Commission on Higher Education. San Francisco: McGraw-Hill, 1971.

Churchman, C. W., Ackoff, R. L., and Arnoff, A. L., Introduction to Operations Research. New York: Wiley, 1957.

Churchman, C. W., The Systems Approach. New York: Dell Publishing Co., Inc., 1968.

Cohen, Michael D., March, James G., and Olsen, Johan P., "A Garbage Can Model of Organizational Choice," Administrative Science Quarterly, pp. 1-25.

Crecine, John P., Governmental Problem Solving: A Computer Simulation of Municipal Budgeting, 1969.

Cyert, Richard M., and March, James G., A Behavioral Theory of the Firm. Englewood Cliffs, New Jersey: Prentice-Hall, 1963.

Dahrendorf, Rolf, Essays in the Theory of Society. Stanford, California: Stanford University Press, 1968.

Davidoff, Paul, "Advocacy and Pluralism in Planning," Journal of the American Institute of Planners, (November 1965), pp. 331-338.

Eide, Kjell, "The Planning Process," Educational Planning in the United States. Itusca, Illinois: Peacock Publishers, Inc., 1969.

Etzioni, Amitai, "Mixed Scanning: A 'Third' Approach to Decision Making," Public Administration Review, Vol. 27, pp. 387-391.

_____, "Human Beings Are Not Very Easy to Change After All," Saturday Review, (June 3, 1972), pp. 45-47.

Farmer, James, quotation taken from notes made at meeting held at the National Center for Higher Education Management Systems in March 1973.

Fenno, Richard F., The Power of the Purse. Boston: Little, Brown & Co., 1966.

Friedman, M., Capitalism and Freedom. Chicago: University of Chicago Press, 1962.

Fromm, Erich, Escape from Freedom. New York: Holt, Rinehart & Winston, Inc., 1965.

Galbraith, John Kenneth, The New Industrial State. Boston: Houghton Mifflin Company, 1967.

Glenny, Lyman A., Autonomy of Public Colleges. New York: McGraw-Hill, 1959.

_____, and Kidder, James, "Trends in State Funding for Higher Education: A Preliminary Report," Higher Education Services Division of the Education Commission of the States, Report No. 33, Denver, Colorado, 1973.

Harris, Seymour E., A Statistical Portrait of Higher Education, Carnegie Commission on Higher Education. San Francisco, California: McGraw-Hill, 1972.

Hayek, Friedrich A., The Road to Serfdom: Are the Democracies Unknowingly Traveling the Totalitarian Road? Chicago: University of Chicago Press, 1944.

Heim, Peggy, "Management Systems and Budgeting Methodology: Do They Meet the Needs and Will They Work," NACUBO: The College and University Business Officer, Vol. 2, No. 2, September 1972.

Hitch, C. J., and McKean, R. N., The Economics of Defense in the Nuclear Age. Cambridge, Massachusetts: Harvard University Press, 1960.

Hirschman, Albert O., Exit, Voice and Loyalty: Responses to Decline in Firms, Organizations and States. Cambridge, Massachusetts: Harvard University Press, 1970.

Homans, George, Social Behavior: Its Elementary Forms. New York: Harcourt, Brace, 1961.

Hoos, Ida R., Systems Analysis in Public Policy: A Critique. Berkeley, California: University of California Press, 1972.

Ilchman, Warren F., and Uphoff, Norman T., The Political Economy of Change. Berkeley, California: University of California Press, 1969.

Jellema, W. W., Efficient College Management. San Francisco, California: Jossey Bass, 1972.

Jenny, H., and Wynn, G. R., The Golden Years. Wooster, Ohio: College of Wooster, 1971.

Jones, Tony, "The Utopian Urge: You Make the Future Today," Harper's, Vol. 246, No. 1474, (March 1973), p. 5.

Kelleher, Grace J., Social Change and Public Policy, Operations Research Society. New York: Wiley, 1970.

Kerr, Clark, The Uses of the University. Cambridge, Massachusetts: Harvard University Press, 1964.

Likert, Rensis, The Human Organization: Its Management and Value. San Francisco, California: McGraw-Hill, 1967.

Lindbloom, Charles E., "The Science of 'Muddling Through'," Public Administration Review, Vol. XIX, No. 2, (Spring 1959), pp. 79-88.

_____, The Policy-Making Process. Englewood Cliffs, New Jersey: Prentice-Hall, 1968.

Lockwood, Geoffrey, University Planning and Management Techniques. Paris, France: Organisation for Economic Cooperation and Development, 1972.

Mannheim, K., Man and Society in an Age of Reconstruction. London: Routledge & Kegan Paul, 1940.

_____, Freedom, Power and Democratic Planning. London: Routledge & Paul, Ltd., 1950.

McKie, James W., "Regulation and the Free Market: The Problem of Boundaries." Washington, D.C.: The Brookings Institution, Reprint 183, 1970.

Meltsner, Arnold J., "Political Feasibility and Policy Analysis," Public Administration Review, Vol. XXXII, No. 6 (November/December 1972), pp. 859-867.

Mill, John Stuart, Utilitarianism, Liberty and Representative Government. New York: Dutton and Company, 1950.

Niskanen, William A., "Why New Methods of Budgetary Choices? Administrative Aspects," Public Administration Review, Vol. XXXII, No. 2, (March/April 1972), pp. 155-161.

Novick, David, Program Budgeting: Program Analysis and the Federal Budget. New York: Holt, Reinhart, Winston, 1969.

Olson, Mancur, Jr., The Logic of Collective Action: Public Goods and the Theory of Groups. New York: Schocken Books, 1965.

O'Neill, June, Resource Use in Higher Education: Trends in Output and Inputs, 1930-1967. Berkeley, California: Carnegie Commission on Higher Education, 1971.

Ostrom, Vincent, The Intellectual Crisis in American Public Administration. University, Alabama: The University of Alabama Press, 1973.

Raiffa, Howard, Decision Analysis. New York: Addison Wesley, 1968.

Rivlin, Alice M., The Planning, Programming and Budgeting System in the Department of Health, Education and Welfare: Some Lessons from Experience, Reprint 162. Washington, D.C.: The Brookings Institution, 1969.

Salner, Marcia, "The Conscious Automaton: An Examination of the Role of Systems Analyst in Campus Planning," Berkeley, California: Division of Higher Education, University of California, June 1971 (unpublished).

Schmidtlein, Frank A., "An Examination of the Environment and Processes of Organizational Decision Making: Some Assumptions and Their Implications," Division of Higher Education, School of Education, University of California, Berkeley, May 1973 (unpublished).

Schultze, Charles L., The Politics and Economics of Public Spending. Washington, D.C.: Brookings Institution, 1968.

Simon, Herbert A., Administrative Behavior: A Study of Decision-Making Processes in Administrative Organization. New York: The Free Press, 1945.

Smith, Adam, Wealth of Nations. New York: Modern Library, 1937.

Toffler, Alvin, Future Shock. New York: Bantam Book of Random House, Inc., 1970.

Trow, Martin, The Expansion and Transformation of Higher Education. New York: General Learning Corporation, 1972.

University of California, Office of the President, Response to Management Audit Report, Vol. I, Parts 1 and 2. Berkeley, California, 1972.

U.S. 92nd Congress, Public Law 92-318, S. 659, June 23, 1972. Washington, D.C.

Weathersby, G. B. and Weinstein, Milton C., A Structural Comparison of Analytical Models for University Planning. Ford Foundation Program for Research in University Administration, University of California, Berkeley Paper P-12, August, 1970.

Western Interstate Commission for Higher Education, Annual Report 1972. Boulder, Colorado: WICHE, January 1973.

Wildavsky, Aaron, The Politics of the Budgetary Process. Boston: Little, Brown & Co., 1964.

_____, "The Political Economy of Efficiency: Cost-Benefit Analysis, Systems Analysis, and Program Budgeting," Public Administration Review, Vol. 26, No. 4, (December 1966).

Wilensky, Harold L., Organizational Intelligence: Knowledge and Policy in Government and Industry. New York: Basic Books, Inc., 1967.

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