Mixed-Scanning: A "Third" Approach to Decision-Making

Amitai Etzioni

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By AMITAI ETZIONI

Columbia University

❯ A rationalistic approach to decision-making requires greater resources than decision-makers command. The incremental strategy, which takes into account the limited capacity of actors, fosters decisions which neglect basic societal innovations. Mixed-scanning reduces the unrealistic aspects of rationalism by limiting the details required in fundamental decisions and helps to overcome the conservative slant of incrementalism by exploring longer-run alternatives. (Incremental decisions tend to imply fundamental ones, anyway.) The mixed-scanning model makes this dualism explicit by combining (a) high-order, fundamental policy-making processes which set basic directions and (b) incremental ones which prepare for fundamental decisions and work them out after they have been reached. Mixed-scanning has two further advantages over incrementalism: It provides a strategy for evaluation and it does not include hidden structural assumptions. The flexibility of the different scanning levels makes mixed-scanning a useful strategy for decision-making in environments of varying stability and by actors with varying control and consensus-building capacities.

IN THE CONCEPT of social decision-making, vague commitments of a normative and political nature are translated into specific commitments to one or more specific courses of action. Since decision-making includes an element of choice, it is the most deliberate and voluntaristic aspect of social conduct. As such, it raises the question: To what extent can social actors decide what their course will be, and to what extent are they compelled to follow a course set by forces beyond their control? Three conceptions of decision-making are considered here with assumptions that give varying weights to the conscious choice of the decision-makers.

Rationalistic models tend to posit a high degree of control over the decision-making situation on the part of the decision-maker. The incrementalist approach presents an alternative model, referred to as the art of "muddling through," which assumes much less command over the environment. Finally, the article outlines a third approach to social decision-making which, in combining elements of both earlier approaches, is neither as utopian in its assumptions as the first model nor as conservative as the second. For reasons which will become evident, this third approach is referred to as mixed-scanning.

The Rationalistic Approach

Rationalistic models are widely held conceptions about how decisions are and ought to be made. An actor becomes aware of a problem, posits a goal, carefully weighs alternative means, and chooses among them according to his estimates of their respective merit, with reference to the state of affairs he prefers. Incrementalists' criticism of this approach focuses on the disparity between the requirements of the model and the capacities of decision-makers.[1] Social decision-making centers, it is

[1] See David Braybrooke and Charles E. Lindblom, *A Strategy of Decision* (New York: Free Press, 1963), pp. 48-50 and pp. 111-143; Charles E. Lindblom, *The Intelligence of Democracy* (New York: Free Press, 1965), pp. 137-139. See also Jerome S. Bruner, Jacqueline J. Goodnow, and George A. Austin, *A Study of Thinking* (New York: John Wiley, 1956) chapters 4-5.

pointed out, frequently do not have a specific, agreed upon set of values that could provide the criteria for evaluating alternatives. Values, rather, are fluid and are affected by, as well as affect, the decisions made. Moreover, in actual practice, the rationalistic assumption that values and facts, means and ends, can be clearly distinguished seems inapplicable:

. . . Public controversy . . . has surrounded the proposal to construct a branch of the Cook County Hospital on the South Side in or near the Negro area. Several questions of policy are involved in the matter, but the ones which have caused one of the few *public* debates of an issue in the Negro community concern whether, or to what extent, building such a branch would result in an all-Negro or "Jim Crow" hospital and whether such a hospital is desirable as a means of providing added medical facilities for Negro patients. Involved are both an issue of *fact* (whether the hospital would be segregated, intentionally or unintentionally, as a result of the character of the neighborhood in which it would be located) and an issue of *value* (whether even an all-Negro hospital would be preferable to no hospital at all in the area) . In reality, however, the factions have aligned themselves in such a way and the debate has proceeded in such a manner that the fact issue and the value issue have been collapsed into the single question of whether to build or not to build. Those in favor of the proposal will argue that the facts do not bear out the charge of "Jim Crowism"—"the proposed site . . . is not considered to be placed in a segregated area for the exclusive use of one racial or minority group"; or "no responsible officials would try to develop a new hospital to further segregation"; or "establishing a branch hospital for the . . . more adequate care of the indigent patient load, from the facts thus presented, does not represent Jim Crowism." At the same time, these proponents argue that whatever the facts, the factual issue is secondary to the overriding consideration that "there is a here-and-now need for more hospital beds. . . . Integration may be the long-run goal, but in the short-run we need more facilities."[2]

In addition, information about consequences is, at best, fractional. Decision-makers have neither the assets nor the time to collect the information required for rational choice. While knowledge technology, especially computers, does aid in the collection and processing of information, it cannot provide for the computation required by the rationalist model. (This holds even for chess playing, let alone "real-life" decisions.) Finally, rather than being confronted with a limited universe of relevant consequences, decision-makers face an open system of variables, a world in which all consequences cannot be surveyed.[3] A decision-maker, attempting to adhere to the tenets of a rationalistic model, will become frustrated, exhaust his resources without coming to a decision, and remain without an effective decision-making model to guide him. Rationalistic models are thus rejected as being at once unrealistic and undesirable.

The Incrementalist Approach

A less demanding model of decision-making has been outlined in the strategy of "disjointed incrementalism" advanced by Charles E. Lindblom and others.[4] Disjointed incrementalism seeks to adapt decision-making strategies to the limited cognitive capacities of decision-makers and to reduce the scope and cost of information collection and computation. Lindblom summarized the six primary requirements of the model in this way: [5]

1. Rather than attempting a comprehensive survey and evaluation of all alternatives, the decision-maker focuses only on those policies which differ incrementally from existing policies.

2. Only a relatively small number of policy alternatives are considered.

3. For each policy alternative, only a restricted number of "important" consequences are evaluated.

4. The problem confronting the decision-maker is continually redefined: Incrementalism allows for countless ends-means and means-ends adjustments which, in effect, make the problem more manageable.

5. Thus, there is no one decision or "right"

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[2] James Q. Wilson, *Negro Politics* (New York: Free Press, 1960), p. 189.

[3] See review of *A Strategy of Decision* by Kenneth J. Arrow in *Political Science Quarterly*, Vol. 79 (1964), p. 585. See also Herbert A. Simon, *Models of Man* (New York: Wiley, 1957), p. 198, and Aaron Wildavsky, *The Politics of the Budgetary Process* (Boston: Little, Brown and Co., 1964), pp. 147-152.

[4] Charles E. Lindblom, "The Science of 'Muddling Through'," *Public Administration Review*, Vol. 19 (1959), pp. 79-99; Robert A. Dahl and Charles E. Lindblom, *Politics, Economics and Welfare* (New York: Harper and Brothers, 1953) ; *Strategy of Decision, op. cit.;* and *The Intelligence of Democracy, op. cit.*

[5] Lindblom, *The Intelligence of Democracy, op. cit.,* pp. 144-148.

solution but a "never-ending series of attacks" on the issues at hand through serial analyses and evaluation.

6. As such, incremental decision-making is described as remedial, geared more to the alleviation of present, concrete social imperfections than to the promotion of future social goals.

Morphological Assumptions of the Incremental Approach

Beyond a model and a strategy of decision-making, disjointed incrementalism also posits a structure model; it is presented as the typical decision-making process of pluralistic societies, as contrasted with the master planning of totalitarian societies. Influenced by the free competition model of economics, incrementalists reject the notion that policies can be guided in terms of central institutions of a society expressing the collective "good." Policies, rather, are the outcome of a give-and-take among numerous societal "partisans." The measure of a good decision is the decision-makers' agreement about it. Poor decisions are those which exclude actors capable of affecting the projected course of action; decisions of this type tend to be blocked or modified later.

Partisan "mutual-adjustment" is held to provide for a measure of coordination of decisions among a multiplicity of decision-makers and, in effect, to compensate on the societal level for the inadequacies of the individual incremental decision-maker and for the society's inability to make decisions effectively from one center. Incremental decision-making is claimed to be both a realistic account of how the American polity and other modern democracies decide and the most effective approach to societal decision-making, i.e., both a descriptive and a normative model.

A Critique of the Incremental Approach as a Normative Model

Decisions by consent among partisans without a societywide regulatory center and guiding institutions should not be viewed as the preferred approach to decision-making. In the first place, decisions so reached would, of necessity, reflect the interests of the most powerful, since partisans invariably differ in their respective power positions; demands of the underprivileged and politically unorganized would be underrepresented.

Secondly, incrementalism would tend to neglect *basic* societal innovations, as it focuses on the short run and seeks no more than limited variations from past policies. While an accumulation of small steps could lead to a significant change, there is nothing in this approach to guide the accumulation; the steps may be circular—leading back to where they started, or dispersed—leading in many directions at once but leading nowhere. Boulding comments that, according to this approach, "we do stagger through history like a drunk putting one disjointed incremental foot after another." [6]

In addition, incrementalists seem to underestimate *their* impact on the decision-makers. As Dror put it, "Although Lindblom's thesis includes a number of reservations, these are insufficient to alter its main impact as an ideological reinforcement of the pro-inertia and anti-innovation forces." [7]

A Conceptual and Empirical Critique of Incrementalism

Incrementalist strategy clearly recognizes one subset of situations to which it does not apply—namely, "large" or fundamental decisions,[8] such as a declaration of war. While incremental decisions greatly outnumber fundamental ones, the latter's significance for societal decision-making is not commensurate with their number; it is thus a mistake to relegate nonincremental decisions to the category of exceptions. Moreover, it is often the fundamental decisions which set the context for the numerous incremental ones. Although fundamental decisions are frequently "prepared" by incremental ones in order that the final decision will initiate a less abrupt change, these decisions may still be considered relatively fundamental. The incremental steps which follow cannot be understood without them, and the preceding steps are useless unless they lead to fundamental decisions.

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[6] Kenneth E. Boulding in a review of *A Strategy of Decision* in the *American Sociological Review*, Vol. 29 (1964), p. 931.

[7] Yehezkel Dror, "Muddling Through—'Science' or Inertia?" *Public Administration Review*, Vol. 24 (1964), p. 155.

[8] Braybrooke and Lindblom, *A Strategy of Decision*, *op. cit.*, pp. 66-69.

Thus, while the incrementalists hold that decision-making involves a choice between the two kinds of decision-making models, it should be noted that (a) *most incremental decisions specify or anticipate fundamental decisions, and* (b) *the cumulative value of the incremental decisions is greatly affected by the related fundamental decisions.*

Thus, it is not enough to show, as Fenno did, that Congress makes primarily marginal changes in the federal budget (a comparison of one year's budget for a federal agency with that of the preceding year showed on many occasions only a 10 per cent difference [9]), or that for long periods the defense budget does not change much in terms of its percentage of the federal budget, or that the federal budget changes little each year in terms of its percentage of the Gross National Product.[10] These incremental changes are often the unfolding of trends initiated at critical turning points at which fundamental decisions were made. The American defense budget jumped at the beginning of the Korean War in 1950 from 5 per cent of the GNP to 10.3 per cent in 1951. The fact that it stayed at about this level, ranging between 9 and 11.3 per cent of the GNP after the war ended (1954-1960), did reflect incremental decisions, but these were made within the context of the decision to engage in the Korean War.[11] Fenno's own figures show almost an equal number of changes above the 20 per cent level as below it; seven changes represented an increase of 100 per cent or more and 24 changes increased 50 per cent or more.[12]

It is clear that, while Congress or other societal decision-making bodies do make some cumulative incremental decisions without facing the fundamental one implied, many other decisions which appear to be a series of incremental ones are, in effect, the implementation or elaboration of a fundamental decision.

For example, after Congress set up a national space agency in 1958 and consented to back President Kennedy's space goals, it made "incremental" additional commitments for several years. Initially, however, a fundamental decision had been made. Congress in 1958, drawing on past experiences and on an understanding of the dynamics of incremental processes, could not have been unaware that once a fundamental commitment is made it is difficult to reverse it. While the initial space budget was relatively small, the very act of setting up a space agency amounted to subscribing to additional budget increments in future years.[13]

Incrementalists argue that incremental decisions tend to be remedial; small steps are taken in the "right" direction, or, when it is evident the direction is "wrong," the course is altered. But if the decision-maker evaluates his incremental decisions and small steps, which he must do if he is to decide whether or not the direction is right, his judgment will be greatly affected by the evaluative criteria he applies. Here, again, we have to go outside the incrementalist model to ascertain the ways in which these criteria are set.

Thus, while actors make both kinds of decisions, the number and role of fundamental decisions are significantly greater than incrementalists state, and when the fundamental ones are missing, incremental decision-making amounts to drifting—action without direction. A more active approach to societal decision-making requires two sets of mechanisms: (a) high-order, fundamental policy-making processes which set basic directions and (b) incremental processes which prepare for fundamental decisions and work them out after they have been reached. This is provided by mixed-scanning.

The Mixed-Scanning Approach

Mixed-scanning provides both a realistic description of the strategy used by actors in a

[9] Richard Fenno, Jr., *The Power of the Purse* (Boston: Little, Brown and Co., 1966), pp. 266ff. See also Otto A. Davis, M. A. H. Dempster, and Aaron Wildavsky, "A Theory of the Budgetary Process," *American Political Science Review,* Vol. 60 (1966), esp. pp. 530-531.

[10] Samuel P. Huntington, quoted by Nelson E. Polsby, *Congress and the Presidency* (Englewood Cliffs, N. J.: Prentice-Hall, 1964), p. 86.

[11] *Ibid.*

[12] Fenno, *The Power of the Purse, loc. cit.*

[13] For an example involving the Supreme Court's decision on desegregation, see Martin Shapiro, "Stability and Change in Judicial Decision-Making: Incrementalism or *Stare Decisis," Law in Transition Quarterly,* Vol. 2 (1965), pp. 134-157. See also a commentary by Bruce L. R. Smith, *American Political Science Review,* Vol. 61 (1967), esp. p. 151.

large variety of fields and the strategy for effective actors to follow. Let us first illustrate this approach in a simple situation and then explore its societal dimensions. Assume we are about to set up a worldwide weather observation system using weather satellites. The rationalistic approach would seek an exhaustive survey of weather conditions by using cameras capable of detailed observations and by scheduling reviews of the entire sky as often as possible. This would yield an avalanche of details, costly to analyze and likely to overwhelm our action capacities (e.g., "seeding" cloud formations that could develop into hurricanes or bring rain to arid areas). Incrementalism would focus on those areas in which similar patterns developed in the recent past and, perhaps, on a few nearby regions; it would thus ignore all formations which might deserve attention if they arose in unexpected areas.

A mixed-scanning strategy would include elements of both approaches by employing two cameras: a broad-angle camera that would cover all parts of the sky but not in great detail, and a second one which would zero in on those areas revealed by the first camera to require a more in-depth examination. While mixed-scanning might miss areas in which only a detailed camera could reveal trouble, it is less likely than incrementalism to miss obvious trouble spots in unfamiliar areas.

From an abstract viewpoint mixed-scanning provides a particular procedure for the collection of information (e.g., the surveying or "scanning" of weather conditions), a strategy about the allocation of resources (e.g., "seeding"), and—we shall see—guidelines for the relations between the two. The strategy combines a detailed ("rationalistic") examination of some sectors—which, unlike the exhaustive examination of the entire area, is feasible—with a "truncated" review of other sectors. The relative investment in the two kinds of scanning—full detail and truncated—as well as in the very act of scanning, depends on how costly it would be to miss, for example, one hurricane; the cost of additional scanning; and the amount of time it would take.

Scanning may be divided into more than two levels; there can be several levels with varying degrees of detail and coverage, though it seems most effective to include an all-encompassing level (so that no major option

will be left uncovered) and a highly detailed level (so that the option selected can be explored as fully as is feasible).

The decision on how the investment of assets and time it to be allocated among the levels of scanning is, in fact, part of the strategy. The actual amount of assets and time spent depends on the total amount available and on experimentation with various inter-level combinations. Also, the amount spent is best changed over time. Effective decision-making requires that sporadically, or at set intervals, investment in encompassing (high-coverage) scanning be increased to check for far removed but "obvious" dangers and to search for better lines of approach. Annual budget reviews and the State of the Union messages provide, in principle, such occasions.

An increase in investment of this type is also effective when the actor realizes that the environment radically changes or when he sees that the early chain of increments brings no improvement in the situation or brings even a "worsening." If, at this point, the actor decides to drop the course of action, the effectiveness of his decision-making is reduced, since, through some high-coverage scanning, he may discover that a continuation of the "loss" is about to lead to a solution. (An obvious example is the selling of a declining stock if a further review reveals that the corporation is expected to improve its earning next year, after several years of decline.) Reality cannot be assumed to be structured in straight lines where each step towards a goal leads directly to another and where the accumulation of small steps in effect solves the problem. Often what from an incremental viewpoint is a step away from the goal ("worsening") may from a broader perspective be a step in the right direction, as when the temperature of a patient is allowed to rise because this will hasten his recovery. Thus mixed-scanning not only combines various levels of scanning but also provides a set of criteria for situations in which one level or another is to be emphasized.

In the exploration of mixed-scanning, it is essential to differentiate fundamental decisions from incremental ones. Fundamental decisions are made by exploring the main alternatives the actor sees in view of his conception of his goals, but—unlike what rationalism

would indicate—details and specifications are omitted so that an overview is feasible. Incremental decisions are made but within the contexts set by fundamental decisions (and fundamental reviews). Thus, each of the two elements in mixed-scanning helps to reduce the effects of the particular shortcomings of the other; incrementalism reduces the unrealistic aspects of rationalism by limiting the details required in fundamental decisions, and contextuating rationalism helps to overcome the conservative slant of incrementalism by exploring longer-run alternatives. Together, empirical tests and comparative study of decision-makers would show that these elements make for a third approach which is at once more realistic and more effective than its components.

Can Decisions Be Evaluated?

The preceding discussion assumes that both the observer and the actor have a capacity to evaluate decision-making strategies and to determine which is the more effective. Incrementalists, however, argue that since values cannot be scaled and summarized, "good" decisions cannot be defined and, hence, evaluation is not possible. In contrast, it is reasonable to expect that the decision-makers, as well as the observers, can summarize their values and rank them, at least in an ordinal scale.

For example, many societal projects have one primary goal such as increasing birth control, economically desalting sea water, or reducing price inflation by one-half over a two-year period. Other goals which are also served are secondary, e.g., increasing the country's R & D sector by investing in desalting. The actor, hence, may deal with the degree to which the *primary* goal was realized and make this the central evaluative measure for a "good" policy, while noting its effects on secondary goals. When he compares projects in these terms, he, in effect, weighs the primary goal as several times as important as all the secondary goals combined. This procedure amounts to saying, "As I care very much about one goal and little about the others, if the project does not serve the first goal, it is no good and I do not have to worry about measuring and totaling up whatever other gains it may be providing for my secondary values."

When there are two or even three primary goals (e.g., teaching, therapy, and research in a university hospital), the actor can still compare projects in terms of the extent to which they realize each primary goal. He can establish that project X is good for research but not for teaching while project Y is very good for teaching but not as good for research, etc., without having to raise the additional difficulties of combining the effectiveness measures into one numerical index. In effect, he proceeds as if they had identical weights.

Finally, an informal scaling of values is not as difficult as the incrementalists imagine. Most actors are able to rank their goals to some extent (e.g., faculty is more concerned about the quality of research than the quality of teaching).

One of the most imaginative attempts to evaluate the effectiveness of programs with hard-to-assess objectives is a method devised by David Osborn, Deputy Assistant Secretary of State for Educational and Cultural Affairs. . . . Osborn recommends a scheme of cross-multiplying the costs of the activities with a number representing the rank of its objectives on a scale. For instance, the exchange of Fulbright professors may contribute to "cultural prestige and mutual respect," "educational development," and gaining "entrée," which might be given scale numbers such as 8, 6, and 5, respectively. These numbers are then multiplied with the costs of the program, and the resulting figure is in turn multiplied with an ingenious figure called a "country number." The latter is an attempt to get a rough measure of the importance to the U.S. of the countries with which we have cultural relations. It is arrived at by putting together in complicated ways certain key data, weighed to reflect cultural and educational matters, such as the country's population, Gross National Product, number of college students, rate of illiteracy, and so forth. The resulting numbers are then revised in the light of working experience, as when, because of its high per capita income, a certain tiny middle-eastern country turns out to be more important to the U.S. than a large eastern European one. At this point, country numbers are revised on the basis of judgment and experience, as are other numbers at other points. But those who make such revisions have a basic framework to start with, a set of numbers arranged on the basis of many factors, rather than single arbitrary guesses.[14]

Thus, in evaluation as in decision-making itself, while full detailed rationalism may well be impossible, truncated reviews are feasible, and this approach may be expected to be more effective in terms of the actors' goals than "muddling through."

[14] Virginia Held, "PPBS Comes to Washington," *The Public Interest*, No. 4 (Summer 1966), pp. 102-115, quotation from pp. 112-113.

Morphological Factors

The structures within which interactions among actors take place become more significant the more we recognize that the bases of decisions neither are nor can be a fully ordered set of values and an exhaustive examination of reality. In part, the strategy followed is determined neither by values nor by information but by the positions of and power relations among the decision-makers. For example, the extent to which one element of mixed-scanning is stressed as against the other is affected by the relationship between higher and lower organizational ranks. In some situations, the higher in rank, concerned only with the overall picture, are impatient with details, while lower ranks—especially experts—are more likely to focus on details. In other situations, the higher ranks, to avoid facing the overall picture, seek to bury themselves, their administration, and the public in details.

Next, the environment should be taken into account. For instance, a highly incremental approach would perhaps be adequate if the situation were more stable and the decisions made were effective from the start. This approach is expected to be less appropriate when conditions are rapidly changing and when the initial course was wrong. Thus, there seems to be no one effective decision-making strategy in the abstract, apart from the societal environment into which it is introduced. Mixed-scanning is flexible; changes in the relative investment in scanning in general as well as among the various levels of scanning permit it to adapt to the specific situation. For example, more encompassing scanning is called for when the environment is more malleable.

Another major consideration here is the capacities of the actor. This is illustrated with regard to interagency relations by the following statement: ". . . the State Department was hopelessly behind. Its cryptographic equipment was obsolescent, which slowed communications, and it had no central situation room at all." [15] The author goes on to show how as a consequence the State Department was less able to act than was the Defense Department.

An actor with a low capacity to mobilize

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[15] Roger Hilsman, *To Move a Nation: The Politics of Foreign Policy in the Administration of John F. Kennedy* (Garden City, N. Y.: Doubleday & Co., 1967), p. 27.

power to implement his decisions may do better to rely less on encompassing scanning; even if remote outcomes are anticipated, he will be able to do little about them. More generally, the greater a unit's control capacities the more encompassing scanning it can undertake, and the more such scanning, the more effective its decision-making. This points to an interesting paradox: The developing nations, with much lower control capacities than the modern ones, tend to favor much more planning, although they may have to make do with a relatively high degree of incrementalism. Yet modern pluralistic societies—which are much more able to scan and, at least in some dimensions, are much more able to control—tend to plan less.

Two different factors are involved which highlight the difference in this regard among modern societies. While all have a higher capacity to scan and some control advantages as compared to nonmodern societies, they differ sharply in their capacity to build consensus. Democracies must accept a relatively high degree of incrementalism (though not as high as developing nations) because of their greater need to gain support for new decisions from many and conflicting subsocieties, a need which reduces their capacity to follow a long-run plan. It is easier to reach consensus under noncrisis situations, on increments similar to existing policies, than to gain support for a new policy. However, the role of crises is significant; in relatively less passive democracies, crises serve to build consensus for major changes of direction which are overdue (e.g., desegregation).

Totalitarian societies, more centralist and relying on powers which are less dependent on consensus, can plan more but they tend to overshoot the mark. Unlike democracies which first seek to build up a consensus and then proceed, often doing less than necessary later than necessary, totalitarian societies, lacking the capacity for consensus-building or even for assessing the various resistances, usually try for too much too early. They are then forced to adjust their plans after initiation, with the revised policies often scaled down and involving more "consensus" than the original one. While totalitarian gross misplanning constitutes a large waste of resources, some initial overplanning and later down-scaling is as

much a decision-making strategy as is disjointed incrementalism, and is the one for which totalitarian societies may be best suited.

A society more able to effectively handle its problems (one referred to elsewhere as an *active society*) [16] would require:

1. A higher capacity to build consensus than even democracies command.

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[16] Amitai Etzioni, *The Active Society: A Theory of Societal and Political Processes* (New York: Free Press, 1968).

2. More effective though not necessarily more numerous means of control than totalitarian societies employ (which new knowledge technology and better analysis through the social sciences may make feasible).

3. A mixed-scanning strategy which is not as rationalistic as that which the totalitarian societies attempt to pursue and not as incremental as the strategy democracies advocate.

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FRANKLIN P. KILPATRICK is dean of the Program of Graduate Studies at the University of Delaware and was a senior staff member of the Brookings Institution from 1959-1967. He received his Ph.D. from Princeton University. Before joining Brookings, he taught psychology at Princeton and served as director of research at National Analysts, Inc. He is the author of *Human Behavior from the Transactional Point of View*, editor of *Explorations in Transactional Psychology*, and coauthor of *The Image of the Federal Service* and *Source Book of a Study of Occupational Values and the Image of the Federal Service*.

NORTON LONG is James Gordon Professor of American Community Government and chairman of the politics department at Brandeis University. He has been an instructor at Queens College and a professor at Western Reserve, Michigan State University, and Northwestern University. He has served in the federal government as assistant to the administrator of the Office of Price Administration and as assistant administrator of the National Housing Administration. From 1961-63 Professor Long was a staff consultant to the governor of Illinois.

FRITZ MORSTEIN MARX is professor of administrative science and public law at the Academy of Administrative Sciences (Speyer, Germany) and visiting professor at the Universities of Heidelberg and Tübingen. Prior to accepting his newly established professorship, he was professor of political science and dean of administration at Hunter College of the City University of New York. Earlier he was a research professor in governmental affairs at Princeton University and for many years was staff assistant, Office of the Director, U. S. Bureau of the Budget. His publications include *The Administrative State* (1957), *Einführung in die Bürokratie* (1959), *Amerikanische Verwaltung* (1963), and *Das Dilemma des Verwaltungsmannes* (1965). He is editor of *Elements of Public Administration* (2nd ed., 1959) and *Verwaltung: Eine einführende Darstellung* (1965).

JOHN D. MILLETT is chancellor of the Ohio Board of Regents. From 1953 to 1964 he served as president of Miami University. Previously, he was a professor of public administration in the graduate faculty of political science at Columbia University. Mr. Millett served on the staff of the President's Committee on Administrative Management in 1936, on the staff of the Committee on Public Administration of the Social Science Research Council from 1939 to 1941, on the staff of the National Resources Planning Board from 1941 to 1942, in the War Department from 1942 to 1946 and again in 1947, on the staff of the first Hoover Commission in 1948, and in the Office of Education in 1964. He is the author of a number of books on public administration and higher education. He was president of ASPA in 1960-61 and is currently the chairman of the newly created National Academy of Public Administration.

ALAN H. SCHECHTER is an assistant professor of political science at Wellesley College, where he teaches courses on American politics and constitutional law. He received a B.A. from Amherst and a Ph.D. from Columbia University. He is the author of *Interpretation of Ambiguous Documents by International Administrative Tribunals* as well as of a number of articles in the fields of American politics, constitutional law, and international law. At present, he is working on a book entitled *Contemporary Constitutional Issues*.