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An Integrated Approach



William N. Dunn



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**William N. Dunn** is Professor in the Graduate School of Public and International Affairs at the University of Pittsburgh, USA.



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# Public Policy Analysis

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## An Integrated Approach

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WILLIAM N. **DUNN**

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# PREFACE

**M**y aim in writing the several editions of this book has been to produce a critical synthesis of the field, while at the same time offering students, instructors, and practitioners a body of knowledge and skills that is applicable to real-world problems. This is not a text in the narrow and conventional sense of the term.

Ever since the publication of the first edition of *Public Policy Analysis* more than thirty-five years ago, I have become more and more convinced that the methodology of policy analysis rests or should rest on epistemological foundations that differ from those of the disciplines of which policy analysis is composed. For this reason, I continue to define policy analysis as an applied social science discipline that employs multiple methods of inquiry to solve practical problems.

What this means is that the methodology of policy analysis cannot be reduced to the theories and analytical routines of microeconomics, because solutions for practical problems demand much more than the analysis of rational choice, expected utility, and opportunity costs. By the same token, the methodology of policy analysis cannot be reduced to the study of politics, because solutions for practical problems require more than the analysis of power, rule, and authority or who gets what, when, and how. Much more is involved. Finally, because a principal aim of policy analysis is to improve policies, the methodology of policy analysis cannot be reduced to an academic spectator sport in which knowledge is prized for its own sake.

In this 6th edition, I have tried to employ a simplified style of writing, choose cases based on real-world analytical practices, and create visual displays that make complex ideas understandable. Case materials now include issues in foreign policy and international security as well as domestic issues of environmental justice, urban economics, transportation, health, and traffic safety. Advanced graphics for mapping and evaluating policy arguments are included in order to cultivate critical thinking skills in areas ranging from expert forecasting and statistical analysis to theories of environmental justice. The book provides students with marketable skills in communicating policy analysis by writing policy memos, position papers, and other products of structured analytical writing. Finally, new review questions and demonstration exercises emphasize active rather than passive learning.

Special instructional devices and learning strategies are again employed throughout the book:

- *Advance organizers.* The book uses advance organizers, especially visual displays, to introduce students to the rationale and application of methods. The advance organizer for the book as a whole is the functional model of policy analysis presented in the first chapter.

- *Learning objectives.* At the beginning of each chapter is a statement of the learning objectives that students should be able to attain by reading the chapter and completing its study questions and demonstration exercises. These objectives are stated in terms of the acquisition of knowledge and skills to do or perform something—that is, behaviorally anchored learning objectives that involve recognizing, defining, understanding, explaining, predicting, evaluating, and applying. By stating learning objectives in this way, the emphasis is on active rather than passive learning, on application rather than memorization.
- *Review questions.* Knowledge and skills must be reinforced. For this reason, review questions are provided at the end of each chapter. The review questions address higher-order knowledge and skills (e.g., explaining or applying) as well as lower-order knowledge and skills (e.g., calculating or estimating). Review questions may be used by students for self-study and by instructors who are developing written assignments, examinations, and tests.
- *Demonstration exercises.* Knowledge and skills are not acquired or retained without frequent opportunities for application to real-world problems. For this reason, each chapter contains opportunities to demonstrate the application of knowledge and skills to practical problems. The attempt is to draw students away from “blackboard policy analysis” into the real world of messy problems.
- *Cases.* Cases in policy analysis are the focus of the demonstration exercises. Cases span a number of issue areas including foreign policy and counter-terrorism, transportation policy, occupational health and safety, and urban policy. Some cases are primarily conceptual; most are methodological in nature.
- *Bibliographies.* In addition to literature cited in footnotes, each chapter is accompanied by a bibliography keyed to the subject matter of that chapter. I have attempted to include literature that is representative of many of the most important recent and classical developments in public policy analysis.
- *Guidelines for written and oral communication.* Students who master methods almost always face difficulties when they are faced with translating and communicating the results of analysis. For this reason, there is an emphasis on writing issue papers, policy memoranda, and position papers, and planning oral briefings. Appendices present step-by-step guidelines and checklists.
- *Argument maps.* Analysis is about making and understanding policy arguments. This edition uses argument maps created with Rationale, an innovative argument mapping program available at [www.reasoninglab.com](http://www.reasoninglab.com). Elsewhere I have expressed my gratitude to Professor Tim van Gelder, one of the originators of the program, for his help.
- *Website.* A special website ([www.routledge.com/9781138743847](http://www.routledge.com/9781138743847)) supports users of this book by providing slides keyed to each chapter and data sets related to cases covered in the chapters. Many of the slides can serve as teaching notes.
- *Argument Mapping Software.* Users of this book may wish to purchase argument mapping software (*Rationale 2*) by going to [www.reasoninglab.com](http://www.reasoninglab.com). Educational discounts are available.

# ACKNOWLEDGEMENTS

I would not have begun this ambitious multidisciplinary project without the encouragement of the late Paul F. Lazarsfeld, who many years ago challenged me to investigate what he called the “policy sciences movement.” Lazarsfeld, one of a handful of premier applied social scientists of the twentieth century, was skeptical about the breadth of the enterprise, as it had been sketched by Harold Lasswell, Daniel Lerner, and others. Its aims seemed to him unwisely all-encompassing and grand, a criticism also held by Charles Lindblom and a number of other policy specialists. Lazarsfeld, it should be said, did not self-identify as a sociologist, but as an applied social scientist with multidisciplinary commitments. For this reason, he was University Professor of Social Science (not Sociology) at the University of Pittsburgh.

Some ten years later, we made an ultimately unsuccessful attempt to fill Lazarsfeld’s vacant chair with another premier applied social scientist, Donald T. Campbell, who had virtually revolutionized the methodology of the applied social sciences in the twentieth century. Campbell, like Lazarsfeld, did not self-identify primarily with his original discipline, which was social psychology, but viewed himself as a multidisciplinary applied social scientist specializing in program and policy evaluation, as well as the philosophy and sociology of science. Had he joined us, Campbell would have been a University Professor of Social Science (not Psychology) at the University of Pittsburgh.

Campbell’s mentorship at a critical stage in my professional life some thirty years ago had a profound effect on the way I think about the strengths and limitations of policy analysis, program evaluation, and the applied social sciences. His imprint can be seen throughout this book.

At about the same time, I was asked to join a team of faculty who were developing curricular materials on policy analysis for practitioners in local governments. Under the leadership of Blue Wooldridge of the National Technical Information Service, now with Virginia Commonwealth University, the group had wisely contracted specialists in learning theory and curriculum development, including Doris Gow and Jyotsna Vasudev, who were brought into the project. I learned from them the important pedagogical lesson that abstract subjects such as policy analysis can be more effectively taught by focusing on behaviorally defined learning objectives and what universities now teach under the rubric of distance learning. I am grateful to them for making me see that much of the literature we assign in courses is not easily or successfully tied to learning outcomes, which means that we often cannot say why we want students to read the materials we assign. This was an embarrassing revelation.

I have been fortunate to meet and work with colleagues who changed my mind about many things, including the important role that the philosophy and sociology of science play in the applied social sciences. These colleagues include Ian I. Mitroff, Burkart Holzner, and my former student and now professor, Bahman Fozouni, who introduced me to yet other colleagues in the Center for History and Philosophy of Science at the

University of Pittsburgh. I learned much about the pragmatic importance of policy analysis and the applied social sciences from Gerald Zaltman, Robert F. Rich, Thomas D. Cook, and the late Carol H. Weiss, all of whom were and are committed to investigating and deliberately changing the conditions under which the social sciences may be used to solve practical problems. B. Guy Peters also taught me much about the need to link policy analysis with the field of governance and, particularly, policy design.

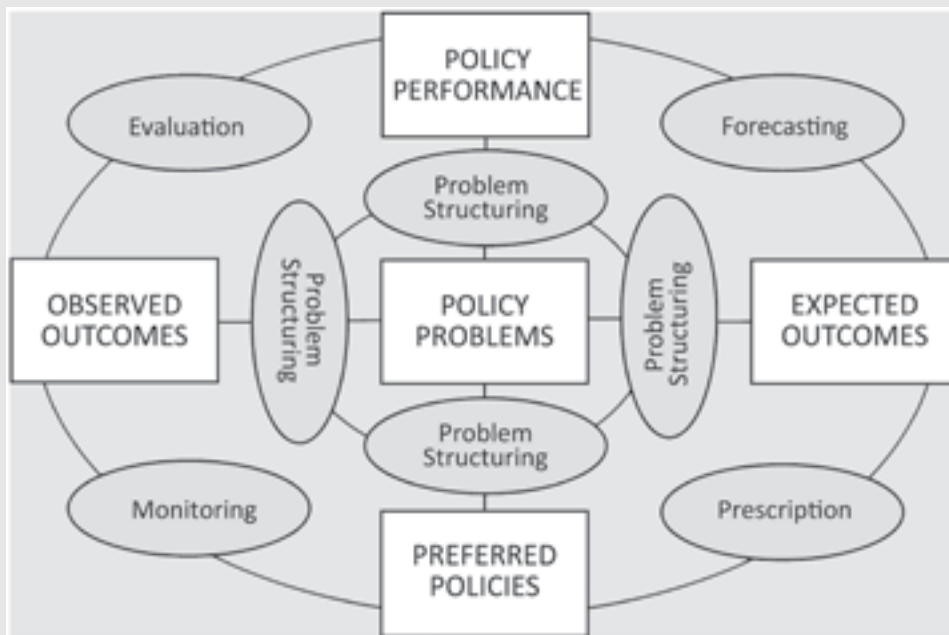
Faculty and students in the Graduate School of Public and International Affairs (GSPIA), University of Pittsburgh, have helped me improve my thinking, writing, and teaching. They include Alex Weilenmann, Louise Comfort, Dipak Gupta, Steve Coulthart, Tom Pavlak, John Mendeloff, Ilia Murtazashvili, Jennifer Murtazashvili, Hector Correa, Michael Sabath, Soumana Sako, Sam Overman, Tony Cahill, Mary Jo Dukes, Sofian Effendi, Kevin Kearns, S. Laurel Weldon, Dave Miller, Ralph Bangs, Jan Jernigan, Neda Milevska, Phil Murphy, Keun Namkoong, Andrea Hegedus, and Phil Williams.

In the past thirty-five years, this book has been used in training, certificate, and degree programs in universities, think tanks, and governments in this country and abroad. Translations into Arabic, Chinese, Indonesian, Korean, Macedonian, Romanian, Russian, Ukrainian, and Spanish are completed or under way. The book has been used in training programs and projects in countries of the European Union, Southeastern Europe, the Middle East, North Africa, and Latin America. The revisions incorporated in this edition reflect some of what I have learned from the participants and organizers of these programs.

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# Methodology of Policy Analysis





# The Process of Policy Analysis

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## LEARNING OBJECTIVES

*By studying this chapter, you should be able to:*

- Define and illustrate phases of policy analysis
- Distinguish four strategies of policy analysis
- Contrast reconstructed logic and logic-in-use
- Distinguish prospective and retrospective policy analysis
- Distinguish problem structuring and problem solving
- Describe the structure of a policy argument and its elements
- Understand the role of argument mapping in critical thinking
- Interpret scorecards, spreadsheets, influence diagrams, decision trees, and argument maps

## INTRODUCTION

Policy analysis is a process of multidisciplinary inquiry aiming at the creation, critical assessment, and communication of policy-relevant knowledge. As a problem-solving discipline, it draws on social science methods, theories, and substantive findings to solve practical problems.<sup>1</sup>

## METHODOLOGY OF POLICY INQUIRY

The *methodology* of policy inquiry refers to the critical investigation of potential solutions to practical problems. Abraham Kaplan, one of the founders of the policy sciences, observed that the aim of methodology is to help understand and question, not only the products of policy inquiry, but the processes employed to create these products. The methodology of policy inquiry contributes to the reflective understanding of theories, methods, and practices of specialized fields such as benefit–cost analysis in economics, implementation analysis in political science, and program budgeting in public administration. These and other specialized fields hold an important place in the process of policy inquiry because they help provide its multidisciplinary foundations.

The methodology of policy inquiry is not the same as methods such as regression analysis, ethnographic interviewing, or benefit–cost analysis, because methodology is concerned with the philosophical assumptions that justify the use of these methods. Nor is the methodology of policy inquiry equivalent to one or another philosophy of science, for example, logical positivism, hermeneutics, or pragmatism.<sup>2</sup> On the contrary, the methodology of policy inquiry is productively eclectic; its practitioners are free to choose among a range of scientific methods, qualitative as well as quantitative, and philosophies of science, so long as these yield reliable knowledge.<sup>3</sup> In this context, policy analysis includes art and craft, which

<sup>1</sup>For a sample of alternative definitions see Harold D. Lasswell, *A Pre-view of Policy Sciences* (New York: American Elsevier Publishing, 1971); Yehezkel Dror, *Ventures in Policy Sciences: Concepts and Applications* (New York: American Elsevier Publishing, 1971); Edward S. Quade, *Analysis for Public Decisions*, 3rd rev. ed., ed. Grace M. Carter (New York: North Holland Publishing, 1989); David L. Weimer and Aidan R. Vining, *Policy Analysis: Concepts and Practice*, 2nd ed. (Englewood Cliffs, NJ: Prentice Hall, Inc., 1992).

<sup>2</sup>Logical positivism (or logical empiricism) was abandoned by most philosophers of science more than 50 years ago, although its epistemological pillars—the correspondence theory of truth, the empirical criterion of meaning, and value-free science—are still venerated by many social scientists. For alternatives to logical positivism in economics and political science see Daniel Bromley, *Sufficient Reason: Volitional Pragmatism and the Meaning of Economic Institutions* (Princeton, NJ: Princeton University Press, 2006); Henry E. Brady and David Collier, eds. *Rethinking Social Inquiry: Diverse Tools, Shared Standards* (Lanham, MD: Rowman Littlefield, 2004); Deirdre N. McCloskey, *The Rhetoric of Economics*, 2nd ed. (Madison: University of Wisconsin Press, 1998); Thomas Ziliak and Deirdre N. McCloskey, *The Cult of Statistical Significance: How the Standard Error Costs Us Jobs, Justice, and Lives* (Ann Arbor: University of Michigan Press, 2008).

<sup>3</sup>Larry Laudan has argued persuasively that the demarcation between science and nonscience, including science, art, and craft, is a pseudo-problem. It is not necessary to ask whether knowledge is “scientific,” only whether it is reliable. “The Demise of the Demarcation Problem,” in R. S. Cohen and L. Laudan, *Physics, Philosophy and Psychoanalysis: Essays in Honor of Adolf Grünbaum*. Boston Studies in the Philosophy of Science, vol. 76 (Dordrecht: D. Reidel, 1983), pp. 111–127. Aaron Wildavsky and others seem to juxtapose art and craft to characterize policy analysis. See Aaron Wildavsky, *Speaking Truth to Power: The Art and Craft of Policy Analysis* (Boston, MA: Little Brown, 1979); and Iris Geva-May and Aaron Wildavsky, *An Operational Approach to Policy*

may be regarded as scientific to the extent that they succeed in producing knowledge that is *reliable* because it can be trusted. Ordinary commonsense knowing and well-winnowed practical wisdom, both products of evolutionary learning across generations of problem solvers, often produce conclusions that are at least as reliable, and sometimes more so, than those produced by specialized social science methods.<sup>4</sup>

The rationale for policy analysis is pragmatic. For this reason, policy analysis is unmistakably different from social science disciplines that prize knowledge for its own sake. The policy-relevance of these disciplines depends, not only on their status as sciences, but on the extent to which they are successful in illuminating and alleviating practical problems. Practical problems, however, do not arrive in separate disciplinary packages addressed, as it were, to social science departments. In today's world, multidisciplinary policy analysis seems to provide the best fit with the manifold complexity of public policymaking.

## MULTIDISCIPLINARY POLICY ANALYSIS

Policy analysis is partly *descriptive*. It relies on traditional social science disciplines to describe and explain the causes and consequences of policies. But it is also *normative*, a term that refers to value judgments about what ought to be, in contrast to descriptive statements about what is.<sup>5</sup> To investigate problems of efficiency and fairness, policy analysis draws on normative economics and decision analysis, as well as ethics and other branches of social and political philosophy, all of which are about what *ought* to be. This normative commitment stems from the fact that analyzing policies demands that we choose among desired consequences (ends) and preferred courses of action (means). The choice of ends and means requires continuing tradeoffs among competing values of efficiency, equity, security, liberty, democracy, and enlightenment.<sup>6</sup> The importance of normative reasoning in policy analysis was well stated by a former undersecretary in the Department of Housing

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*Analysis: The Craft, Prescriptions for Better Analysis* (Boston, MA: Kluwer, 1997). The term *policy sciences* is Harold Lasswell's. See the short methodological history of the policy sciences in Ronald Brunner, "The Policy Movement as a Policy Problem," in *Advances in Policy Studies since 1950*, vol. 10, *Policy Studies Review Annual*, ed. W. N. Dunn and R. M. Kelly (New Brunswick, NJ: Transaction Books, 1992), pp. 155–197, and contributions to Michael Moran, Martin Rein, and Robert E. Goodin, eds., *The Oxford Handbook of Public Policy* (Oxford: Oxford University Press, 2006).

<sup>4</sup>On the contrasts between scientific and professional knowledge, on one hand, and ordinary commonsense knowing, on the other, see Charles E. Lindblom and David K. Cohen, *Usable Knowledge: Social Science and Social Problem Solving* (New Haven, CT: Yale University Press, 1979). On the overall soundness of evolved practical knowledge—but the periodic need for supplemental scientific testing—see Donald T. Campbell, "Evolutionary Epistemology," in *Methodology and Epistemology for Social Science: Selected Papers*, ed. E. S. Overman (Chicago, IL: University of Chicago Press, 1989).

<sup>5</sup>A classic statement of the difference between positive and normative knowledge in economics is Milton Friedman, *Essays in Positive Economics* (Chicago, IL: University of Chicago Press, 1953). This same positive-normative distinction is present throughout the social sciences. This same positive-normative distinction is the basis for Dennis C. Muller's *Public Choice III* (Cambridge: Cambridge University Press, 2012), a widely respected treatise on positive and normative economic theory and research.

<sup>6</sup>See Deborah Stone, *Policy Paradox: The Art of Political Decision Making*, rev. ed. (New York: W. W. Norton, 2001), and Harold D. Lasswell, *A Pre-view of Policy Sciences* (New York: Elsevier, 1971).

and Urban Development: “Our problem is not to do what is right. Our problem is to know what is right.”<sup>7</sup>

## Policy-Relevant Knowledge

Policy analysis is designed to provide *policy-relevant knowledge* about five types of questions:

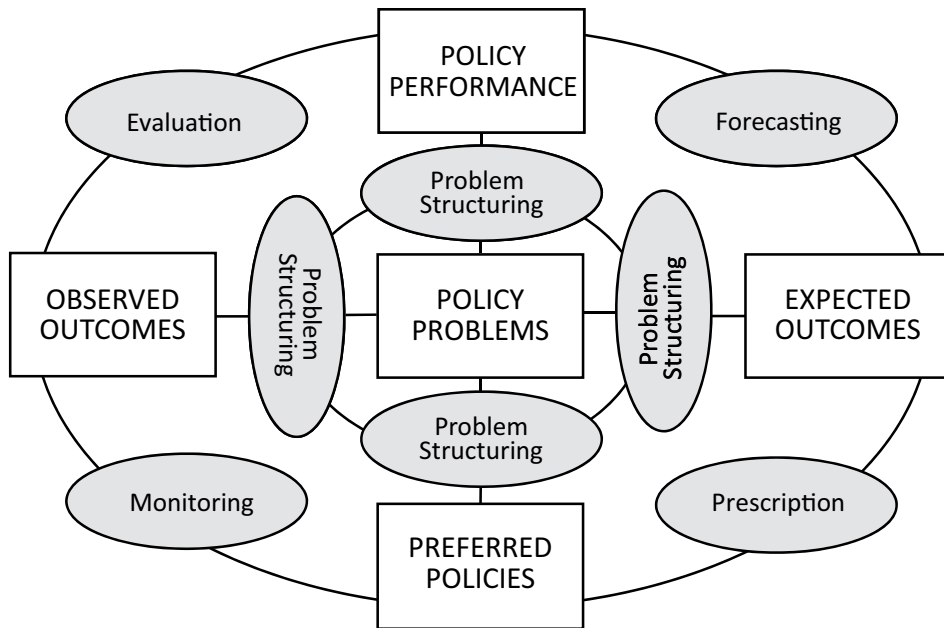
- *Policy problems.* What is the problem for which a potential solution is sought? Is global warming a man-made consequence of vehicle emissions, or a consequence of periodic fluctuations in the temperature of the atmosphere? What alternatives are available to mitigate global warming? What are the potential outcomes of these alternatives and what is their value or utility?
- *Expected policy outcomes.* What are the expected outcomes of policies designed to reduce future harmful emissions? Because periodic natural fluctuations are difficult if not impossible to control, what is the likelihood that emissions can be reduced by raising the price of gasoline and diesel fuel or requiring that aircraft use biofuels?
- *Preferred policies.* Which policies should be chosen, considering not only their expected outcomes in reducing harmful emissions, but the value of reduced emissions in terms of monetary costs and benefits? Should environmental justice be valued along with economic efficiency?
- *Observed policy outcomes.* What policy outcomes are observed, as distinguished from the outcomes expected before the adoption of a preferred policy? Did a preferred policy actually result in reduced emissions, or did decreases in world petroleum production and consequent increases in gasoline prices and reduced driving also reduce emissions?
- *Policy performance.* To what extent has policy performance been achieved, as defined by valued policy outcomes signaling the reduction of global warming through emissions controls? To what extent has the policy achieved other measures of policy performance, for example the reduction of costs of carbon emissions and global warming to future generations?

Answers to these questions yield these five types of policy-relevant knowledge, which are shown as rectangles in Figure 1.1.<sup>8</sup>

*Policy problems* are representations of problem situations, which are diffuse sets of worries, inchoate signs of stress, or surprises for which there is no apparent solution. Knowledge of what problem to solve requires knowledge about the antecedent conditions of a problem situation (e.g., school dropouts as an antecedent of unemployment), as well as knowledge about values (e.g., safe schools or a living wage) whose achievement may lead to the definition of the problem and its potential solutions. Knowledge about policy

<sup>7</sup>Robert C. Wood, quoting President Lyndon B. Johnson in his “Foreword” to *The Study of Policy Formation*, ed. Raymond A. Bauer and Kenneth J. Gergen (New York: Free Press, 1968), p. v.

<sup>8</sup>A similar framework, designed for the discipline of sociology, was suggested by Walter Wallace, *The Logic of Science in Sociology* (Chicago, IL: Aldine Books, 1971). Wallace’s framework addresses research methodology in sociology, while Figure 1.1 addresses the multidisciplinary research methodology of policy analysis.



**FIGURE 1.1**  
Multidisciplinary Policy Analysis

problems also includes at least two potential solutions to the problem and, if available, the probabilities that each alternative is likely to achieve a solution. Knowledge about policy problems plays a critical role in policy analysis, because the way a problem is defined shapes the identification of available solutions. Inadequate or faulty knowledge may result in serious or even fatal errors: defining the wrong problem.<sup>9</sup>

*Expected policy outcomes* are likely consequences of adopting one or more policy alternatives designed to solve a problem. Knowledge about the circumstances that gave rise to a problem is important for producing knowledge about expected policy outcomes. Such knowledge is often insufficient, however, because the past does not repeat itself, and the values that shape behavior may change in future. For this reason, knowledge about expected policy outcomes is not “given” by the existing situation. To produce such knowledge may require creativity, insight, and the use of tacit knowledge.<sup>10</sup>

<sup>9</sup>Defining the wrong problem is a Type III error, as contrasted with Type I and Type II errors committed when the level of statistical significance (*alpha*) is set too high or too low in testing the null hypothesis. Early statements of this contrast are Howard Raiffa, *Decision Analysis* (Reading, MA: Addison-Wesley, 1968), p. 264, and Ian I. Mitroff and Thomas R. Featheringham, “On Systematic Problem Solving and the Error of the Third Kind,” *Behavioral Sciences* 19, 6 (1974): 383–393.

<sup>10</sup>Books that address creativity, insight, and tacit knowledge are Yehezkel Dror, *Ventures in Policy Sciences: Concepts and Applications* (New York: American Elsevier Publishing, 1971); Sir Geoffrey Vickers, *The Art of Judgment: A Study of Policy Making* (New York: Basic Books, 1965); and C. West Churchman, *The Design of*

A *preferred policy* is a potential solution to a problem. To select a preferred policy, it is necessary to have knowledge about expected policy outcomes as well as knowledge about the value or utility of the expected outcomes. Another way to say this is that factual as well as value premises are required for a policy prescription. The fact that one policy is more effective or efficient than another does not alone justify the choice of a preferred policy. Factual premises must be joined with value premises involving equality, efficiency, security, democracy, enlightenment, or some other value.

An *observed policy outcome* is a present or past consequence of implementing a preferred policy. It is sometimes unclear whether an outcome is actually an effect of a policy. Some effects are not *policy* outcomes, because many outcomes are the result of other, extra-policy factors. It is important to recognize that the consequences of action cannot be fully stated or known in advance, which means that many consequences are neither anticipated nor intended. Fortunately, knowledge about observed policy outcomes can be produced after policies have been implemented.

*Policy performance* is the degree to which an observed policy outcome contributes to the solution of a problem. In practice, policy performance is never perfect. Problems are rarely “solved”; most often problems are resolved, reformulated, and even “unsolved.”<sup>11</sup> To know whether a problem has been solved, requires knowledge about observed policy outcomes, as well as knowledge about the extent to which these outcomes contribute to the valued opportunities for improvement that gave rise to a problem.

## Knowledge Transformations

The five types of policy-relevant knowledge are interdependent. The solid lines connecting each pair of components in Figure 1.1 represent *knowledge transformations*, where one type of knowledge is changed into another, so that the creation of knowledge at any point depends on knowledge produced in an adjacent (and most often previous) phase. Knowledge about policy performance, for example, depends on the transformation of prior knowledge about observed policy outcomes. The reason for this dependence is that any assessment of how well a policy achieves its objectives assumes that we already have reliable knowledge about the outcomes of that policy. Note, however, that types of knowledge are connected with solid lines rather than arrows to show that knowledge can be transformed backward and forward in an iterative fashion. The process of transformation is rarely linear.

Knowledge about policy problems is a special case. Knowledge about policy problems contains other types of knowledge. Some types of knowledge may be included—for example, knowledge about preferred policies—and others excluded. What is included or excluded in the formulation of a problem affects which policies are eventually prescribed, which values are chosen as criteria of policy performance, and which expected outcomes

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*Inquiring Systems; Basic Concepts of Systems and Organization* (New York: Basic Books, 1971). The concept of tacit knowledge is attributed to Michael Polanyi, *Personal Knowledge* (Chicago, IL: University of Chicago Press, 1958).

<sup>11</sup>Russell L. Ackoff, “Beyond Problem Solving,” *General Systems* 19 (1974): 237–239.

warrant or do not warrant attention. At the risk of being repetitious, it is worth stressing that a fatal error of policy analysis is a Type III error—defining the wrong problem.<sup>12</sup>

## Policy-Analytic Methods

The five types of policy-relevant knowledge are produced and transformed by using policy-analytic methods, which are the vehicles driving the production and transformation of knowledge. Methods involve judgments of different kinds<sup>13</sup>: judgments to accept or reject an explanation, to affirm or dispute the rightness or wrongness of a preferred policy, to prescribe or not prescribe a preferred policy, to accept or reject a prediction about an expected outcome, to formulate a problem in one way rather than another.

In policy analysis, these methods have special names:

- *Problem structuring.* Problem-structuring methods are employed to produce knowledge about what problem to solve. Problem-structuring methods include the influence diagram and decision tree presented in Case 1.2 of this chapter (“Using Influence Diagrams and Decision Trees to Structure Problems of Energy and Highway Safety Policy”). Other examples of problem-structuring methods include argument mapping (Case 1.3, “Mapping International Security and Energy Crises”). Chapter 3 of this book covers problem-structuring methods more extensively.
- *Forecasting.* Forecasting methods are used to produce knowledge about expected policy outcomes. Although many kinds of forecasting methods are covered in Chapter 4, an example of a simple forecasting tool is the scorecard described in Case 1.1 (The Goeller Scorecard and Technological Change). Scorecards, which are based on the judgments of experts, are useful in identifying expected outcomes of science and technology policies.
- *Prescription.* Methods of prescription are employed to create knowledge about preferred policies. An example of a prescriptive method is the spreadsheet (in Case 1.2, “Using Influence Diagrams and Decision Trees”). The spreadsheet goes beyond the identification of expected policy outcomes by expressing consequences in terms of monetary benefits and costs. Benefit–cost analysis and other methods of prescription are presented in Chapter 5.
- *Monitoring.* Methods of monitoring are employed to produce knowledge about observed policy outcomes. The scorecard (Case 1.1) is a simple method for monitoring observed policy outcomes as well as forecasting expected policy outcomes. Chapter 6 covers methods of monitoring in detail.
- *Evaluation.* Evaluation methods are used to produce knowledge about the value or utility of observed policy outcomes and their contributions to policy performance.

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<sup>12</sup>Type I and Type II errors are also known as false positives and false negatives. Other sources on Type III errors include A. W. Kimball, “Errors of the Third Kind in Statistical Consulting,” *Journal of the American Statistical Association* 52 (1957): 133–142; Howard Raiffa, *Decision Analysis* (Reading, MA: Addison-Wesley, 1968); and Ian I. Mitroff, *The Subjective Side of Science* (New York: Elsevier, 1974).

<sup>13</sup>John O’Shaughnessy, *Inquiry and Decision* (London: George Allen & Unwin, 1972).

Although evaluation methods are covered more fully in Chapter 7, the spreadsheet in Case 1.2 may be used for evaluation as well as prescription.

The first method, problem structuring, is about the other methods. For this reason, it is a *metamethod* (method of methods). In the course of structuring a problem, analysts typically experience a “troubled, perplexed, trying situation, where the difficulty is, as it were, spread throughout the entire situation, infecting it as a whole.”<sup>14</sup> *Problem situations* are not problems, because problems are representations or models of problem situations. Hence, problems are not “out there” in the world but stem from the interaction of the thoughts of many persons and the external environments in which they work or live. It is important to understand that analysts with different perspectives see the same problem situation in different ways. Imagine a graph showing increased national defense expenditures in trillions of dollars. The problem situation, represented by the graph, may be seen by one stakeholder as evidence of increasing national security (more of the budget is allocated to defense) and by another as an indication of declining resources for social services (less of the budget can be allocated to social services). Problem structuring, a process of testing different formulations of a problem situation, governs the production and transformation of knowledge produced by other methods. Problem structuring, which is important for achieving approximate solutions to ill-structured or “wicked” problems,<sup>15</sup> is the central guidance system of policy analysis.

Policy-analytic methods are interdependent. It is not possible to use one method without using others. Thus, although it is possible to monitor past policies without forecasting their future consequences, it is usually not possible to forecast policies without first monitoring them.<sup>16</sup> Similarly, analysts can monitor policy outcomes without evaluating them, but it is not possible to evaluate an outcome without first monitoring the existence and magnitude of an outcome. Finally, to select a preferred policy typically requires that analysts have already monitored, evaluated, and forecasted outcomes.<sup>17</sup> This is another way of saying that policy prescription is based on factual as well as value premises.

Figure 1.1 supplies a framework for integrating methods from different disciplines and professions. The five policy-analytic methods are used across political science, sociology, economics, operations research, public administration, program evaluation, and ethics.

<sup>14</sup>John Dewey, *How We Think* (Boston, MA: D. C. Heath and Company, 1933), p. 108. The original statement of the difference between a problem and a problem situation is attributable to philosophical pragmatists including Charles Sanders Peirce and John Dewey.

<sup>15</sup>The original statement about “wicked” problems, a term coined by C. West Churchman in 1967, is Horst W. Rittel, “On the Planning Crisis: Systems Analysis of the First and Second Generations,” pp. 390–396. Berkeley, CA: Institute of Urban and Regional Development. A more recent statement is Sandra S. Batie, “Wicked problems and applied economics.” *American Journal of Agricultural Economics*, 90, 5 (2008): 1176–1191.

<sup>16</sup>An exception is predictions made on the basis of expert judgment or on abductive (retroductive) reasoning. The explanation of a policy is not necessary for predicting its future consequences. Strictly speaking, a prediction is a causal inference, whereas a projection, extrapolation, or “rational forecast” is not. On abductive reasoning in economics see Daniel W. Bromley, *Volitional Pragmatism and the Meaning of Economic Institutions* (Princeton, NJ: Princeton University Press, 2006).

<sup>17</sup>Causation may be assumed but not understood. Recipes claim only that a desired result is a consequence of action. Joseph L. Bower, “Descriptive Decision Theory from the ‘Administrative’ Viewpoint,” in *The Study of Policy Formation*, ed. Raymond A. Bauer and Kenneth J. Gergen (New York: Free Press, 1968), p. 10.