

## INSTITUTIONAL ANALYSIS

Editors, Michael D. McGinnis and Elinor Ostrom

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## POLYCENTRIC GAMES AND INSTITUTIONS

*Readings from the  
Workshop in Political Theory  
and Policy Analysis*

Michael D. McGinnis, Editor

Ann Arbor

THE UNIVERSITY OF MICHIGAN PRESS

## Contents

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Published in the United States of America by

The University of Michigan Press

Manufactured in the United States of America

♾ Printed on acid-free paper

2003 2002 2001 2000 4 3 2 1

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A CIP catalog record for this book is available from the British Library.

Library of Congress Cataloging-in-Publication Data

Polycentric games and institutions : readings from the Workshop in Political Theory and Policy Analysis / Michael D. McGinnis, editor.

p. cm. — (Institutional analysis)

Includes bibliographical references and index.

ISBN 0-472-09714-8 (cloth : alk. paper) — ISBN 0-472-06714-1 (pbk. : alk. paper)

1. Political science—Congresses. 2. Policy sciences—Congresses.

I. McGinnis, Michael D. (Michael Dean). II. Indiana University, Bloomington. Workshop in Political Theory and Policy Analysis. III. Series.

JA35.5 .P65 2000

320'.01'13—dc21

00-055961

List of Figures	vii
List of Tables	ix
Series Foreword	xi
Acknowledgments	xv
<b>Introduction</b> <i>by Michael D. McGinnis</i>	1
<b>Part I. Developing a Framework for the Analysis of Institutions</b>	
Chapter 1. Public Choice: A Different Approach to the Study of Public Administration <i>by Vincent Ostrom and Elinor Ostrom</i>	34
Chapter 2. The Three Worlds of Action: A Metatheoretical Synthesis of Institutional Approaches <i>by Larry L. Kiser and Elinor Ostrom</i>	56
Chapter 3. An Agenda for the Study of Institutions <i>by Elinor Ostrom</i>	89
Chapter 4. A Grammar of Institutions <i>by Sue E. S. Crawford and Elinor Ostrom</i>	114
<b>Part II. Voting, Conflict, and Leadership</b>	
Chapter 5. Votes and Vetoes <i>by Roberta Herzberg and Vincent Ostrom</i>	168
Chapter 6. Negative Decision Powers and Institutional Equilibrium: Experiments on Blocking Coalitions <i>by Rick Wilson and Roberta Herzberg</i>	184
Chapter 7. Policy Uncertainty in Two-Level Games: Examples of Correlated Equilibria <i>by Michael D. McGinnis and John T. Williams</i>	202

Chapter 8. Shepherds and Their Leaders among the <i>Raikas</i> of India: A Principal-Agent Perspective <i>by Arun Agrawal</i>	237
<b>Part III. Rules, Regulations, and Resource Management</b>	
Chapter 9. Heterogeneous Players and Specialized Models <i>by Eric Rasmusen</i>	275
Chapter 10. Governing a Groundwater Commons: A Strategic and Laboratory Analysis of Western Water Law <i>by Roy Gardner, Michael Moore, and James Walker</i>	285
Chapter 11. Bottlenecks and Governance Structures: Open Access and Long-Term Contracting in Natural Gas <i>by Thomas P. Lyon and Steven C. Hackett</i>	308
<b>Part IV. Models of Monitoring and Sanctioning</b>	
Chapter 12. Transforming Rural Hunters into Conservationists: An Assessment of Community-Based Wildlife Management Programs in Africa <i>by Clark C. Gibson and Stuart A. Marks</i>	336
Chapter 13. Irrigation Institutions and the Games Irrigators Play: Rule Enforcement on Government- and Farmer-Managed Systems <i>by Franz J. Weissing and Elinor Ostrom</i>	366
Chapter 14. Coping with Asymmetries in the Commons: Self-Governing Irrigation Systems Can Work <i>by Elinor Ostrom and Roy Gardner</i>	399
<b>Part V. Continuing Challenges for Research and Policy</b>	
Chapter 15. Neither Markets nor States: Linking Transformation Processes in Collective Action Arenas <i>by Elinor Ostrom and James Walker</i>	427
Chapter 16. A Behavioral Approach to the Rational Choice Theory of Collective Action <i>by Elinor Ostrom</i>	472
Suggested Further Readings	523
Contributors	527
Index	533

## Figures

2.1 The Working Parts of Institutional Analysis	59
2.2 Three Levels of Institutional Analysis	60
4.1 Equilibrium Diagram: Game with a Norm and Monitoring	136
4.A1 Base Game	143
4.A2 Repeated Game with Shared Strategies	144
4.A3 Game with a Norm and Monitoring	145
4.A4 Game with a Rule	146
6.1 Set of Unblocked Points to $x_0$ under Simple Majority Rule	187
6.2 Blocking by a Single Member	189
6.3 Outcomes under SMR and SMB Treatments	191
6.4 Voting Agenda: Experiment G5:2	196
7.1 Payoffs and Correlated Equilibrium Distributions in a Chicken Game	209
7.2 A Spatial Voting Example	214
7.3 Examples of Correlated Equilibria in a Spatial Voting Game	217
7.4 Examples of Correlated Equilibria in a Two-Level Game	222
7.5 Domestic Representation of a Correlated Equilibrium in a Two-Level Game	224
8.1 A Simplified Model of Decision Making among the <i>Raikas</i>	243
8.2 The Relationship between Cheating and Sanctions	246
8.3 The Relationship between Cheating and Monitoring	251
9.1 The Tullock Game	276
9.2 The Football Game	276
9.3 The Football Game with Risk Aversion and Jealousy	277
12.1 Choices Confronting Wildlife Scouts and Local Hunters	338

## CHAPTER 2

## The Three Worlds of Action: A Metatheoretical Synthesis of Institutional Approaches

*Larry L. Kiser and Elinor Ostrom*

Studying the effects of institutional arrangements on patterns of human behavior and the resulting patterns of outcomes is a strategy of inquiry used by scholars straddling the academic disciplines of political science and economics. Institutional arrangements are the rules used by individuals for determining who and what are included in decision situations, how information is structured, what actions can be taken and in what sequence, and how individual actions will be aggregated into collective decisions. Institutional arrangements are thus complex composites of rules, all of which exist in a language shared by some community of individuals rather than as the physical parts of some external environment.

As language-based phenomena, institutional rules do not impinge directly on the world (V. Ostrom 1980). A change in a decision rule (for example, adopting a two-thirds instead of a majority voting rule) cannot have an immediate and direct effect on some physical distribution of things. Institutional change impinges on the world by affecting the shared understandings of individuals making choices within decision situations affected by the rules. Effects in the world will result, if they do, in three steps. First, the individuals affected by a change in rules must be cognizant of and abide by the change. Second, institutional change has to affect the strategies they adopt. Third, the

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Originally published in Elinor Ostrom, ed., *Strategies of Political Inquiry* (Beverly Hills, CA, 1982), 179–222. Copyright © 1982 by Sage Publications, Inc. Reprinted by permission of Sage Publications, Inc. and the authors.

Authors' note: Major portions of this manuscript were written while Kiser was a postdoctoral trainee at the Workshop in Political Theory and Policy Analysis at Indiana University, under an NIMH traineeship on "Research Training in Institutional Analysis and Design" (Grant No. 5 T32 MH15222). The essay draws on a long tradition of work and discussion at the Workshop and could not have been written without the extended discussions and comments on earlier, related manuscripts among participants including Deby Dean, Vernon Greene, John Hamilton, Roger B. Parks, Stephen L. Percy, Ron Oakerson, Vincent Ostrom, Rick Wilson, and Susan Wynne. We appreciate the helpful comments we received on the first draft of this manuscript from David Austin, Judy Gillespie, David Kessler, Roger B. Parks, Cyrus Reed, and Rick Wilson. We also appreciate Teresa Therrien's careful work in editing and typing this manuscript.

aggregation of changed individual strategies must lead to different results. Not all changes in behavior lead to changes in outcomes. A change in the institutional arrangement for deciding energy policy, for example, does not change patterns of energy use until individuals in their everyday lives lower thermostat settings, join a car pool, buy a solar heater, and so on.

This complex set of transformations from rules through common understanding of decision situations to individual behavior is difficult to analyze and understand. The purpose of this essay is to provide a metatheoretical framework for understanding the complex set of transformations that links institutional arrangements to individual behavior and aggregate results occurring in the "real" world. The framework is *metatheoretical*, because it describes the array of elements that is used in specific theories about institutions rather than presenting a particular theory.

This metatheoretical framework focuses on the scholarly work in political science and economics that uses a microinstitutional approach to the analysis of political phenomena. The microinstitutional approach is "micro" because it starts from the individual as a basic unit of analysis to explain and predict individual behavior and resulting aggregated outcomes. It is an "institutional" approach because major explanatory variables include the set of institutional arrangements that individuals use to affect the incentive systems of a social order and the impact of incentive systems on human behavior.

Patterns of human action and the results that occur in interdependent choice-making situations are the phenomena to be explained using this approach. Interdependence occurs whenever results are dependent on the actions of more than one individual. Interdependence can at times produce aggregated results that vary dramatically from individual expectations or preferences. Interdependence describes hundreds of everyday experiences as individuals interact with one another, trying to achieve a better life in the marketplace, within families, in clubs, in neighborhoods, in legislatures, in bureaucracies, and in other collective arrangements (see Schelling 1978 for a discussion of such situations).

Interdependent decision situations can be incredibly complex. Institutional analysts abstract from this complexity by modeling typical decision situations and the behavior of individuals involved in such situations. Analysts attempt to identify the smallest set of working parts to yield a coherent and testable theory for observed patterns of actions and results. Given the complexity of the theoretical models used in institutional analysis, social scientists wishing to understand this literature are frequently confused about how the various elements of the theories are linked together and about how theorists use key terms. We try to provide a synthesis and overview of the political-economy literature that uses the individual as a unit of analysis while asking how institutional arrangements affect the level, type, and distri-

bution of outcomes. This essay is like a schematic road map to a complex, difficult, and changeable academic terrain. We hope it will help the neophyte interested in gaining an overview before approaching the specifics. We also hope it will help those who have traveled the hills and valleys of institutional analysis and who may wish to step back with us and look at the slippery terrain they have traveled from a more general perspective.

While many authors have contributed to this approach, we have been particularly influenced in offering this synthesis by the work of Kenneth Arrow, James Buchanan, John R. Commons, Anthony Downs, Frank Knight, Mancur Olson, Vincent Ostrom, William Riker, Kenneth Shepsle, Herbert Simon, Thomas Schelling, Gordon Tullock, and Oliver Williamson. Instead of peppering this essay with extensive and disruptive citations, we have provided the reader with a general bibliography of many of the key articles and books related to the synthesis presented here.

### The Theoretical Working Parts of Institutional Analysis

Implicit or explicit in the theories explaining individual behavior within institutional structures are five working parts, including (1) the decision maker, (2) the community affected by interdependent decision making, (3) events (or goods and services) that interacting individuals seek to produce and consume, (4) institutional arrangements guiding individual decisions, and (5) the decision situation in which individuals make choices. Political economists select appropriate assumptions about the attributes of each working part. The set of assumptions about the working parts explains actions by individual decision makers and aggregated outcomes. Figure 2.1 shows the relationship among the five working parts, actions, and outcomes.

The framework displayed in figure 2.1 rests on a methodological individualist perspective. Attributes of the individual decision maker constitute the core of the analysis. Assumptions about the individual animate all particular models based on this microinstitutional frame (Popper 1967; Simon 1978). However, several alternative assumptions may be made within the model of the individual used by a particular theorist. This approach is distinct from macroinstitutional political economy, which animates theoretical models with social forces beyond the influence of individuals. Individuals in macroinstitutional political economy have little choice but to obey these overriding social forces.

While methodological individualism places the attributes of individual decision makers at the core of the analytical framework, the other working parts are equally important to the explanations derived from the framework. The other working parts establish the environment in which individuals

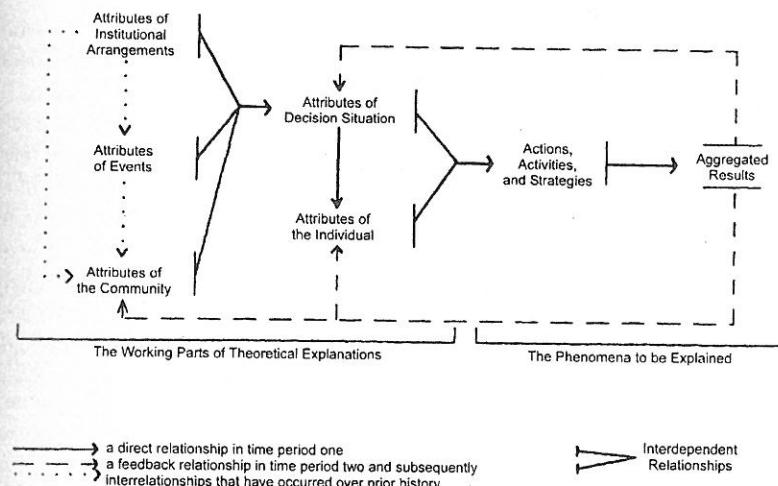


Fig. 2.1. The working parts of institutional analysis

make choices. Combining assumptions about all five working parts enables political economists to predict two types of results. One prediction addresses individual decision makers' strategies or actions, and the second prediction addresses the aggregation of individual actions into outcomes for the community.

Political economists rarely develop all five working parts within a given analysis. Writers tend to focus, instead, on changes within one or two working parts, assuming that all other working parts remain unchanged. Unfortunately, such assumptions are often implicit and lead to error. Holding other factors constant is not equivalent to ignoring them. The configuration of working parts constitutes the environment in which individuals make choices; thus, analysis must recognize the condition of the unchanging factors (see Boynton 1982). Ignoring any of the working parts can misrepresent the decision maker's environment and produce misleading predictions.

To use an analogy, one can think of a specific model developed to explain the effect of institutional arrangements as a large Tinkertoy composed of at least five components, each of which also contains a number of elements or subcomponents. The large Tinkertoy model is built to resemble a more complex and indeterminate machine that operates in the real world. The Tinkertoy is a successful model for some purpose if it helps predict what the complex machine will do under particular circumstances. No single Tinkertoy model is used to predict the actions for all complex machines that might be modeled by institutional theorists. As different machines are modeled, major changes may be made in some subcomponents, while other work-

ing parts may remain relatively stable. However, changes in some of the working parts may require changes in others, since considerable interdependence exists among the particular assumptions made about different working parts.

Political economists apply the working parts of microinstitutional analysis at three related but distinct levels of analysis. One is the *operational level*, which explains the world of action. The second is the *collective choice level*, which explains the world of authoritative decision making. The third is the *constitutional level*, which explains the design of collective-choice mechanisms. The operational, collective-choice, and constitutional levels of analysis are the “three worlds” referred to in our title. Figure 2.2 displays the three levels of analysis and the components of each level. It shows that the same working parts make up all three worlds. This essay, therefore, concentrates first on each of the working parts, applying them to the world of action. We then apply the working parts to the other two levels of analysis.

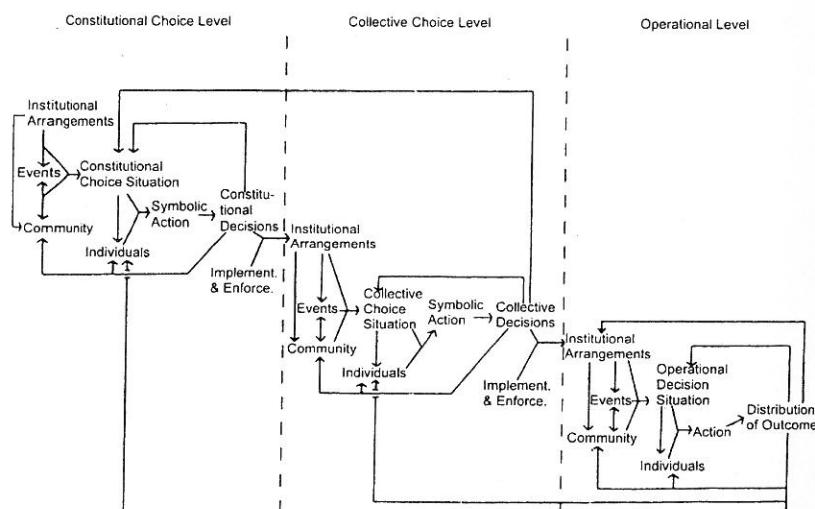


Fig. 2.2. Three levels of institutional analysis

#### Attributes of the Individual

Microinstitutional political economy emphasizes that only individuals, not groups, act. To predict that action, theorists must at least make assumptions about

1. the individual's level of information about the decision situation,
2. the individual's valuation of potential outcomes and of alternative

actions possible within the decision situation, and

3. the individual's calculation process for selecting among alternative actions or strategies.

Individuals act to achieve valued outcomes; therefore, individuals must have some notion of how actions link up with outcomes and how values are realized by selecting among alternative actions.

Neoclassical economists handle the three minimum assumptions by modeling an individual producer in a competitive market as having perfect information about relevant goods and resource prices, as valuing only profits, and as calculating to maximize expected profits. Herbert Simon and others influenced by him (see Williamson 1975) develop alternative models by assuming that the individual producer possesses incomplete information about the decision situation. These political economists also assume that individuals value multiple outcomes rather than just profits and that individuals sometimes have difficulty discriminating among the rankings of these outcomes. The producer is much less precise in decision making than the producer in the neoclassical model, searching for information and learning the characteristics of the decision situation. The Simon-type producer is less apt than the neoclassical producer to maximize values and is more likely to seek satisficing levels.

The individual in both the neoclassical and the Simon approaches is rational, although scholars within the neoclassical tradition frequently criticize Simon's work as “antirational.” Simon (1957, 1972, 1978) defends his model of the individual as intendedly rational. The difference between the two specific models is the amount of information that individuals possess about themselves and their environment. The difference causes the individual to use a different calculating process for deciding how to act within a given decision situation.

Specific assumptions about information, valuation, and calculation in the model of the individual help to shape the overall model of interdependent choice. Neoclassical assumptions of complete information and profit maximization yield, when combined with the other working parts, a highly determinate, machinelike general theory. Assumptions of incomplete information, multiple values, and satisficing yield a less determinate, more flexible theory of choice (see V. Ostrom and Hennessey 1975; V. Ostrom 1976). The neoclassical assumptions are useful when modeling uncomplicated market exchange situations, but Simon-type assumptions are apt to be more useful when modeling more complex situations where options continually shift.

#### Attributes of the Decision Situation

Figure 2.1 shows that the attributes of the individuals combine with the attributes of the decision situation to yield individuals' actions or strategies.

The decision maker, in other words, chooses a strategy that is suitable to the decision situation. An individual with given attributes will make different choices as decision situations change. Also, as noted earlier, changes in the attributes of decision situations can require changes in the attributes of the individual decision maker. Particular assumptions about the individual's valuation of outcomes and calculation process must be compatible with the decision situation.

The literature on game theory investigates the attributes of decision situations, developing attributes such as

1. the number of decision makers involved;
2. the types of choices available to the decision maker;
3. the linkages between actions and results;
4. complexity;
5. repetitiveness;
6. types of outcomes (zero-sum, positive sum, and so on);
7. durability, stability, reversibility, and vulnerability to threat of outcomes; and
8. possibilities for communication among interacting decision makers.

Decision theorists who are not interested in the study of institutional arrangements stop with a model of the decision situation. Most game theorists, for example, do not inquire about the variables that affect a decision situation. The decision situation is itself taken as a given rather than as the result of other variables. Considerable theoretical advances in decision theory have been based on an in-depth examination of the behavior of differently modeled individuals in differently structured decision situations. Mancur Olson (1965), for example, develops the concept of the free rider within the context of alternative decision situations, showing that an individual is more apt to choose a free-riding strategy in large-group rather than small-group situations. Other writers note that the tragedy of the commons is more likely to occur in large-group rather than in small-group situations.

The linkages between actions and results are especially important in describing decision situations, as this is where the concept of the degree of certainty is described. To describe a situation as certain is to assert that each alternative action available to a decision maker links to one and only one result. Risk and uncertainty, on the other hand, recognize the possibility of multiple results linked to at least some of the actions. Risk describes a situation where probability distributions across alternative results can be known, while uncertainty describes a situation where probability distributions across results cannot be known.

This essay does not permit a full review of the attributes for decision

situations. Hamburger (1979) presents an elementary introduction to this literature, outlining alternative descriptions of gaming situations and developing the relationship between the decision situation, the individual decision maker, and the choice among strategies. In general, the decision situation describes the array of choices confronting the decision maker and the pattern of consequences likely to flow from alternative choices. The attributes of the individual describe the capabilities and motives of the individual in the decision situation. The mix of the decision situation's attributes and the individual's attributes causes the individual to select particular actions.

#### Actions and Strategies

Microinstitutional political economy predicts individuals' actions and strategies and aggregated results flowing from models of decision makers within defined decision situations. An action in tennis, for example, can be either charging the net or defending the baseline. The player's choice depends on the player and the situation.

Political economists distinguish between actions and strategies. An action is like a "move" in a game, while a strategy is a sequence of moves. Thus, situations permitting only a single act at a particular decision point prohibit strategy, while repetitive situations encourage it. The decision maker in repetitive situations may make the same move every time the decision situation repeats, or the decision maker may randomly switch from one move to another. The consistent approach is called a "pure" strategy and the switching approach a "mixed" strategy.

Strategy implies commitment to a method for selecting actions over time. A strategy is a plan of action, often contingent upon other decision makers' actions. The strategy of "tit for tat" in extended Prisoners' Dilemma games is a contingent strategy. One player cooperates on the second play of the game if the other player cooperates on the first play of game. Complex decision situations such as those in chess require contingent strategy, because a player can select the best move only after the opposing player makes a move.

Strategy also involves activities such as information gathering, giving, and withholding. Also, strategies include threats, guile, bargaining, and force. Some strategies are "sophisticated" plans where an individual makes real or apparent sacrifices on initial rounds of a decision situation to increase the possibility for gains in later rounds. Farquharson (1969) discusses the strategy of voting for a less favored option early in a contest to increase the probability of being able to vote for a more favored option later. Another sophisticated plan is the act of binding oneself irrevocably to particular future actions. Individuals often pre-commit when they fear they will succumb to short-term temptations that counter long-term interests (Elster 1979; Thaler and Sheffrin 1981).

### Aggregated Results

The mathematical transformation of individual acts into group results often surprises the people whose acts produced the results. Individuals sometimes do not connect aggregate results with their own individual actions. Thomas Schelling (1978) gives an example of aggregation in the children's game of musical chairs, where every child rushes to sit in a chair when the music stops. The result is that one child is always left standing. Regardless of how determined each child is to sit and how aggressively each child plays the game, the mathematical transformation of the actions to results is always the same. There is always one more child in the game than there are chairs; therefore, someone must stand.

The result in musical chairs is intended, but the results in many group situations are unintended. Schelling gives another example: individual drivers slowing down to look at a rush-hour automobile accident in the opposite lane of an expressway. Drivers would be happy with a quick, ten-second look; but the resulting traffic jam gives them an extra ten-minute drive home. Each driver acts to participate, at least vicariously, in the excitement of the accident; but the result is boredom. When complaining about the traffic jam later, many drivers probably fail to admit that their own actions helped to produce their misery. Thomas Hobbes, writing long before the age of the automobile, recognized the problem when he described men in the state of nature striving for their own good and finding only misery.

Why do individuals take actions that bring on misery? How can they avoid the misery and realize happiness instead? These kinds of questions lead us to focus on the left side of figure 2.1, to examine attributes of institutional arrangements, attributes of events, and attributes of community as they affect decision situations.

### Institutional Arrangements

Economists and political scientists rejected for some time any self-conscious study of institutional arrangements. Both disciplines placed these "skeletons" in the academic closet for many years.<sup>1</sup> Only recently has work on institutional arrangements reappeared in respectable academic journals and publishing houses (Blumstein 1981; Riker 1980; Shepsle 1979). The relatively recent attention to institutions means that the conception of institutional arrangements is necessarily incomplete. To streamline work in this area and to encourage additional analysis, we propose a new conceptualization of institutional arrangements. Our purpose is to develop a typology that can be applied to a wide range of institutional conditions.

Institutional arrangements are the sets of rules governing the number of

decision makers, allowable actions and strategies, authorized results, transformations internal to decision situations, and linkages among decision situations. Examining institutional arrangements involves a stepping back in the process to look at one of the three major factors affecting the structure of decision situations. The givens are no longer givens but rather the results of the interaction of rules, events, and community.

Hurwicz (1973) uses the term *decision mechanism* to describe institutional arrangements, conveying the image of a device constraining and guiding the choices that individuals make. Institutional arrangements simultaneously restrict and expand the freedom for individual action. As John R. Commons (1950, 21) wrote, "an institution is collective action in control, liberation, and expansion of individual action" (see also Knight 1965, 304). Persons interacting in a market situation are restricted, because they can only conduct particular types of voluntary transactions. Persons in legislative situations are also restricted, because they can vote only on amendments and legislation according to highly formalized procedures.

But institutional rules also expand freedom by increasing predictability in decision situations. Decision makers knowing that rules restrict actions by other decision makers can predict responses to their own actions better than they could without those rules. An auto salesperson, for example, is freer to grant credit to a buyer, knowing that rules require future payment and that courts exist to enforce those rules. Otherwise, buyers and sellers would limit themselves to transactions with immediate payment in full.

Rules, of course, require enforcement to be effective; but much theoretical work overlooks the enforcement aspect by assuming that decision makers take only lawful actions. The assumption simplifies analysis, enabling analysts to concentrate on issues unrelated to enforcement. But if the assumption is unconscious, the analysis can yield implications incongruent with a real world of illegal behavior. Sometimes analysis needs to include enforcement variables to explain real-world actions. Interaction with complicated games like football is more predictable when on-site referees aggressively mete out penalties to keep play within the rules.

This does not imply that enforcement is the only reason that individuals follow rules.<sup>2</sup> People also follow rules because those in a community share a belief that the rules are fair. Individuals within such a community, expecting others to follow the rules, see opportunities to pursue their own interests by following the rules too. Without this shared belief, enforcement would become too expensive to maintain regularity and predictability in ongoing human relationships.

Institutional arrangements transform an individual's actions into outcomes affecting both the actor and others. Predictability of action-outcome linkages, therefore, depends upon both transformations in the physical world

and transformations within decision mechanisms in the institutional world. A person drives safely to work because the physical operation of cars on the road is predictable and because other motorists' behavior according to traffic rules is predictable. The driver's control over outcomes increases because each motorist possesses rights of way on the road and commensurate duties to observe equivalent rights of others.

Scholars frequently refer to institutional arrangements by organization names such as markets, legislatures, courts, private firms, public bureaus, contracts, and international treaties. But we propose a more abstract reference that facilitates comparison among organizational structures. The proposal looks to the rules that characterize all institutional arrangements—rules delineating the participants and allowable actions, rules distributing authority among participants, rules aggregating participants' choices into collective decisions, rules outlining procedure and information flows, and rules distributing payoffs among participants. These rules may be formal, that is, detailed and written, or informal, that is, simply understood by participants in the arrangement. Informal rules are what Commons (1959, 138) calls the "working rules of a going concern," rules that evolve perhaps unconsciously with the functioning of the organization.

We distinguish between institutional arrangements and organizations. Political economists frequently interchange the terms, but in our attempt to abstract comparisons among organizations we define institutional arrangements as distinct from organizations. We define organizations as composites of participants following rules governing activities and transactions to realize particular outputs. These activities occur within specific facilities. The rules, which are components of all organizations, are the institutional arrangements.

The distinction between institutional arrangements and organizations avoids problems of classifying organizations by proper name. National legislatures, for example, make up a single class; but legislatures can function very differently from one another. Identifying the rules or the institutional arrangements of the legislatures helps one to understand those important differences, whereas classifying by the term *legislature* obscures vital information about the way those organizations operate (see Shepsle 1979).

Our typology of institutional rules classifies rules according to their effect on decision situations and on individual choice behavior within decision situations.<sup>3</sup> The typology concentrates on (1) the entry and exit conditions for participating in organizations, (2) allowable actions and allowable outcomes from interaction within organizations, (3) the distribution of authority among positions within organizations to take particular actions, (4) the aggregation of joint decisions within organizations, (5) procedural rules in complex situations linking decision situations together, and (6) information constraints within organizations.

The types of rules that address each of these six issues are (1) boundary rules, (2) scope rules, (3) position and authority rules, (4) aggregation rules, (5) procedural rules, and (6) information rules. Each set of rules helps to shape incentives facing individuals within decision situations. Other aspects of institutional arrangements may also affect decision makers' incentives, but we think these six include aspects theorists identify as most important to explain behavior within and outcomes from interdependent decision situations.

The rules in intercollegiate tennis provide an example of institutional arrangements. The rules delineate

1. who can enter tennis as a competitive sport within the member universities and the conditions under which players lose eligibility (boundary rules);
2. the size of the court, the height of the net, the physical actions that a player is allowed to take, the number of times the ball can bounce on each side of the net, and the allowed set of outcomes (scope rules);
3. the rights and duties assigned to players and to referees (position and authority rules);
4. how specific acts and physical results are scored and aggregated into wins and losses (aggregation rules);
5. how players will proceed through tournament competition (procedural rules); and
6. how information about opponents' strategies, tournament rules, specific calls, and other matters is conveyed to participants (information rules).

Any particular model of an institutional arrangement will need to make particular assumptions about boundary rules, scope rules, position and authority rules, aggregation rules, procedure rules, and information rules. Given the large number of combinations of specific rules that can be designed, we are unlikely ever to have a complete theory of institutions.<sup>4</sup> However, substantial theoretical and empirical work has recently focused on the effect of one or more of these types of rules or the behavior of individuals in particular types of decision situations.

#### The Attributes of Events

People have long been aware that the nature of goods affects calculations bearing upon human welfare. Aristotle (1962, 58), for example, observed, "that which is common to the greatest number has the least care bestowed upon it." This aspect of decision making has attracted even more attention with the growth of public-goods analysis in recent times.

The variety in goods and events is vast. But most of the variety is inconsequential to the effects of institutional arrangements on the results of human interaction. A given institutional arrangement can effectively guide resource allocation toward notably dissimilar goods. Arrangements within competitive markets, for example, effectively make both wheat and television sets available to consumers. But competitive markets are ineffective in making police protection or environmental cleanup available.

This section focuses on attributes of goods that distinguish wheat and television sets from police protection and environmental cleanup and that affect the ability of markets to make those goods available. The discussion identifies attributes of goods and events that help to shape individuals' decision-making incentives. The attributes include jointness of use, exclusion, degree of choice, and measurability.<sup>5</sup>

### *Jointness of Use or Consumption*

Howard Bowen (1943–44) distinguished between goods consumed simultaneously by more than one individual (joint consumption) and goods consumed by a single individual (separable consumption). The distinction is the effect that use by one individual has on the goods' availability to others. An individual's use of separable consumption goods reduces the goods' availability to others, while an individual's use of joint consumption goods permits simultaneous use by others. Paul Samuelson (1954, 1955) repeated this distinction a decade later with the classic series of articles on pure public goods. Samuelson called joint consumption goods public goods, defining "a public good as a good which is subject to joint or collective consumption where any one individual's consumption is *nonsubtractible* from any other individual's consumption of a good" (1954, 387; our emphasis). Samuelson (1954, 877) also noted that "a public consumption good differs from a private consumption good in that each man's consumption of it is related to the total by a condition of equality rather than that of summation."

Few, if any, joint consumption goods are perfectly nonsubtractible. The gravitational pull of the earth is an example: Regardless of the number of people using gravitational pull, the force is equally available to additional users. Most joint consumption goods are only partially nonsubtractible. When the number of users reaches some critical point, one person's use partially reduces the good's availability for simultaneous use by others. Highway congestion is an example. The highway is available for simultaneous use by many motorists, but as traffic builds during rush hours, one motorist's use of the highway causes delays and inconvenience for others. Buchanan (1970) identified the effects of congestion in public goods as erosion, noting the role of supply in contending against the degradation of public goods.

### *Exclusion*

Scholars have extended the analysis of public goods, adding other characteristics to distinguish public from private goods. Musgrave (1959), Head (1962), and Olson (1965) identified the attribute of exclusion, noting that a public good makes excluding additional consumers infeasible once the good is available to any consumer. A private good, on the other hand, makes exclusion feasible. An individual can use the good without sharing it with other consumers. Anyone can benefit from a nonexcludable public good or event so long as nature or producers supply it. Nature supplies the air we breathe, and it is freely available to all. Producers supply views of buildings, and the views (whether obnoxious or enjoyable) are also freely available to all.

Both exclusion and jointness of consumption vary continuously. Goods are rarely totally excludable or totally nonexcludable, and they are rarely totally subtractible or totally nonsubtractible. But analysis frequently presumes pure categories to sharpen the distinction between public and private goods.

Exclusion and jointness of consumption are independent attributes, permitting a classification of goods according to table 2.1. The table shows jointness of consumption with two columns, one for highly subtractible goods and one for less subtractible goods. The table shows exclusion with two rows, one for low-cost exclusion goods and one for high-cost exclusion goods. The result is four cells distinguishing private goods, which are highly subtractible and where exclusion is inexpensive, from public goods, which are less subtractible and where exclusion is expensive. Toll goods and common-pool resources range between these two extremes with both types possessing some attributes of publicness. Toll goods are less subtractible, but exclusion is cheap. Common-pool resources are highly subtractible, but exclusion is expensive.

### *Measurement*

Since public goods are difficult to package or unitize, they are usually also difficult to measure. Measures such as hectares, meters, and kilograms do not apply. While other kinds of indexes are possible, such as decibels, degrees,

TABLE 2.1. Jointness of Consumption

Exclusion	Highly Subtractible	Less Subtractible
Low cost	Private goods: bread, milk, automobiles, haircuts	Toll goods: theaters, night clubs, telephone service, cable TV, electric power, library
High cost	Common-pool resources: water pumped from a ground water basin, fish taken from an ocean, crude oil extracted from	Public goods: peace and security, of a community, national defense, mosquito abatement, air pollution

Note: Table 2.1 is adapted from V. Ostrom and E. Ostrom (1977a, 12).

and parts per million, aggregation is difficult with these measures. Sometimes indexes do not even exist. Thus, producers often know only imprecisely what they are producing, and consumers know only imprecisely what they are consuming. Cost calculations, valuation, and pricing are, therefore, often crude.

Private goods, on the other hand, are easier to package or unitize and, thus, to measure. This helps both producers and consumers make more informed decisions regarding such goods. Producers apply more precise cost-accounting procedures and management controls when producing private goods, and consumers make more precise budgeting decisions when consuming private goods.

#### *Degree of Choice*

Nonsubtractable and nonexcludable goods frequently give individuals little choice about consumption. The mere existence of a commodity may force individuals to consume it or at least pay much to avoid consuming the commodity. Some forced consumers may not even value the commodity. Congested streets, for example, inconvenience local residents and shoppers, who are required to cope with the traffic whether they like it or not. Private goods, however, do not pose this problem. The individual who does not value a private good simply need not purchase it.

#### *Institutional Arrangements and Public Goods*

The capacity of individuals to achieve a relatively optimal level of any type of goods is dependent upon the type of institutional rules developed to relate individuals to one another and to events in the world. However, the design of effective institutional arrangements to produce public goods is more difficult than the design of effective institutional arrangements to produce private goods. Mancur Olson (1965) demonstrates that nonsubtractable and nonexcludable public goods present serious problems in human organization. Once a public good is supplied, all individuals within the relevant domain are free to use the good without paying toward the cost of producing it. Cost-minimizing individuals have an incentive to become "free riders," holding out on others who pay. The free riders' success encourages others to stop payment, too, causing a drop in the amount of the good supplied. Unless institutional changes create new incentives, each person responding to self-interest ignores the interests of other, and ultimately all suffer.

Economists have developed the implications of the public-private goods distinction for the market system, concluding that competitive markets fail to allocate resources toward public goods efficiently. In some cases the failure may be complete, with no production and consumption of the public good resulting. Welfare is maximized where the sum of all consumers' marginal

rates of substitution (that is, valuation of marginal consumption units) equals the social marginal cost of producing the good. Voluntary market transactions fail to achieve this condition. The market distribution of prices for a public good among consumers is unlikely to correspond to the distribution of consumer marginal valuations, because markets generally require the same price from all consumers.

This problem does not develop in a market for private goods. Each consumer independently purchases more or less of the good at the market price, depending on consumer preferences. Consumers with marginal valuations exceeding the price of the good purchase additional units until marginal values fall to equal the price. Consumers with marginal valuations below the price reduce purchases until marginal values rise to equal the price. The result is that while consumers with different preferences pay the same price, the market permits efficient adjustment among consumers. Furthermore, competition among producers assures that producers use economically efficient means for producing the good.

Public-good situations usually require some form of collective action with sanctions compelling each individual to share in the production costs. Individuals in small groups can monitor each other's costs. Individuals in small groups can monitor each other's actions and personally coerce each other to share costs. Thus, families can effectively provide joint consumption goods for members. But large groups are not so effective with casual arrangements. Each individual is more anonymous, and each individual's share of the good seems insignificant. Thus, each is tempted to free ride on payments by others, unless the group coerces payment from users. The lack of coercion leads to Aristotle's contention that the good or property shared by "the greatest number has the least care bestowed upon it."

Institutional arrangements with coercive sanctions are not sufficient to guarantee optimal amounts of public goods. Instruments of coercion may harm as well as help. As governmental institutions permit officials to deprive some citizens and reward others, institutional arrangements designed to advance the common good might become an instrument of tyranny instead. Moreover, difficulties in measuring the output of public goods and services imply that government officials have difficulties monitoring the performance of public employees. Service delivery, therefore, departs from desired levels.

Where citizens have little choice about the quality of public services supplied to them, they also have little incentive to do anything about those services. Citizens' costs of trying to change the quality can exceed increased benefits that individual citizens can expect. The structure of institutional arrangements may have some effect on the degree of choice that individuals have. Different electoral systems, such as the plurality-vote or single-member constituencies used in the United States, give more voice to individual con-

stituents than other systems, such as the proportional-representation, party-list arrangements characteristic of Western Europe. Councilpersons representing local wards would be more sensitive to protests by local residents about how streets are used in those wards than are councilpersons elected at large. Voucher systems where individuals use a pro rata share of tax funds to obtain services from alternative vendors of educational services, for example, may allow for a much greater degree of choice on the part of individual users.

Our tennis example illustrates the influence of the attributes of goods on decision situations. Tennis players and spectators jointly consume the benefits of a game, but exclusion is relatively easy. Fencing tennis courts is legally allowable and is inexpensive. The fence helps to exclude individuals who do not qualify, by membership in a group or by admission price, for entry to the game. Thus, tennis is a toll good, fitting the northeast cell in table 2.1. Private voluntary arrangements and collective arrangements both effectively make this good available to consumers.

Fencing also affects players' strategies during a game. A fence retains the ball, causing players to play more aggressively than they would without the fence. Aggressive play does not interfere with games in neighboring courts or require time out to chase an errant ball.

### The Community

The community is the third cluster of variables constituting the decision situation. The community includes all individuals directly or indirectly affected by the decision situation. The attributes of the community relevant to institutional analysis include the level of common understanding, similarity in individuals' preferences, and the distribution of resources among those affected by a decision situation.

The relevant community in our tennis example includes the players and others affected by the game results, particularly by a continued iteration of the tennis games. In intercollegiate tennis, the community includes players, referees, judges, spectators, students, parents, and alumni. College administrators who govern student activities and who participate in intercollegiate athletic associations are also part of the community. In intramural tennis the community is much smaller, often including only the opposing players. The differences in the community between intercollegiate and intramural tennis alter the competition and change decision situations for players. A player will probably use a strategy in an intercollegiate game that differs from his or her strategy in a friendly intramural game.

#### *Level of Common Understanding*

Common understanding among community members is necessary for interde-

pendent decision situations. Without common understanding a community of individuals dissolves into a disorganized aggregate with no social cohesion. Common understanding among community members may grow from a history of shared experience, enhanced by common terms and resulting in common expectations.

Individuals cannot play a game without coming to a common understanding of the rules. Players must share a similar view of the range of allowable actions, or the distribution of rights and duties among players, of likely consequences, and of preferences among players for alternative outcomes. Common understanding, however, does not imply equal distribution of information among community members. Some common knowledge of the institutional constraints is necessary for interdependent decision making, but participants may vary in their level of knowledge. Incentives, therefore, may differ among individuals (even individuals with similar preferences) choosing within similar decision situations.

Rule-ordered transformations do not, however, provide the level of predictability that physical mechanisms can provide. Part of the ambiguity arises from problems with human language. Montias (1976, 18) defines a rule as "a message stipulating and constraining the actions of a set of participants for an indefinite period and under specified states of these individuals' environments." The messages, relying on language, are sometimes garbled or ambiguous. Because words are "symbols that name, and thus, stand for classes of things and relationships" (V. Ostrom 1980, 10), words are always simpler than the phenomena to which they refer.

Stability in rule-ordered transformations depends upon shared definitions of the words formulating the rules. Even if all community members conscientiously try to implement a confusing law, it will yield irregular behavior when individuals interpret the law in a variety of circumstances. As "rules are not self-formulating, self-determining, or self-enforcing" (V. Ostrom 1980, 11), individuals must formulate the rules, apply them to particular circumstances, and enforce performance consistent with them. Ambiguity can arise at any of these points.

Changing circumstances aggravate the instability in rule-ordered transformations. Vincent Ostrom (1980, 1) writes,

the exigencies to which rules apply are themselves subject to change. Applying language to changing configurations of development increases the ambiguities and threatens the shared criteria of choice with erosion of their appropriate meaning.

Predicting behavior, therefore, on the basis of rules is necessarily imprecise, with the degree of imprecision depending on the existence of mecha-

nisms for resolving conflicting interpretations of rules. Such mechanisms enhance the shared meaning of rules and reduce variation in behavior.

When individuals frequently interact directly with one another in a particular decision situation, as in tennis, the level of common understanding is higher than when individuals participate infrequently and in widely disparate locations. However, a geographically dispersed community can interact in a market when its members share a common understanding of the market's structure through frequent interaction and through enforcement of property law.

#### *Level of Common Agreement about Values*

A second community characteristic affecting the decision situation is the level of agreement among members when evaluating actions and results in interdependent decision making. This is especially important in situations that force consumption upon individuals in a community. Lack of agreement usually distorts the distribution of cost among community members, causing ferment among those assuming disproportionate burdens. This helps to explain the general unrest within the United States during the war in Vietnam, which forced many citizens to participate in what they considered to be an immoral war. Common agreement about values is less important in situations involving private goods.

Community agreement about institutional arrangements, however, is always important. Agreement about the moral correctness and the fairness of rules constraining decision making reduces the need for enforcement. Otherwise, individuals seek to evade and change the rules. Individuals' actions become less predictable and the order of the system breaks down, causing authorities to invest heavily to monitor community members' actions and to impose sanctions on members taking unauthorized actions.

#### *Distribution of Resources*

A third attribute of the community relevant to institutional analysis is the resource distribution among community members. A competitive market is defined to be a situation of nearly equal distribution among producers. No single producer possesses enough resources to manipulate market prices or to influence market transactions.

Individuals controlling disproportionate resource shares for participating in particular decision structures fundamentally affect the nature of the decision situation. The decision situation differs from the equal distribution case, even when institutional rules and attributes of events remain the same. Thus, if a few firms gain market control, the situation changes from one involving many decision makers (a competitive situation) to one involving a few (an oligopolistic situation). Economic theory predicts that producer decisions in

a competitive situation will differ from decisions in an oligopoly. Decisions in legislatures and other political organizations also change when power distributions, say from leadership qualities, grow less equal.

#### **Feedback among the Working Parts**

The discussion so far addresses only the rightward flow of relationships among the working parts. Figure 2.1 shows that institutional arrangements, attributes of goods and events, and attributes of community combine to determine attributes of the decision situation. The attributes of the decision situation combine with the attributes of the individual decision maker to yield actions and strategies. Actions and strategies aggregate finally into results or outcomes.

Figure 2.1, however, also shows feedback relationships moving from right to left. Aggregated results subsequently affect the community attributes, attributes of the decision situation, and attributes of the individual. Reasoning along the feedback paths presumes that the working parts of the framework have cycled at least once, with individuals choosing in a given decision situation, acting on those choices, and realizing outcomes. The feedbacks show the dynamic quality of the framework.

Consider the feedback from results to the attribute of the community. Perhaps the most direct effect of outcomes is to increase the community's shared experience from interaction. This alters the community and decisions by members of the community. Our tennis example illustrates the change. If a player decides during a particular volley to charge the net, both players experience the result. The next time the opportunity to charge the net arises, even though the physical situation is exactly like the first occasion, the decision situation is not the same. The opposing player has some insight into the first player's strategy and ability and has some insight into his or her own ability to counter the charge to the net. The links between alternative actions and their consequences, therefore, change, perhaps causing the offensive player this time to play toward the baseline.

Feedback from results to the attributes of the individual shows the effects of experience on the individual decision maker rather than on the community. Whereas feedback to the community alters subsequent decision situations, feedback to the individual alters the decision maker's understanding of the decision situation. The decision maker, therefore, may change strategies in the situation and may even change objectives.

The tennis player, having charged the net during an earlier volley and scored, may decide that scoring is not as enjoyable as expected if the tactic demoralizes the opposing player. The game ceases to be fun, so the next time the player may change strategy by challenging the opposing player with a returnable volley.

### The Three Levels of Analysis

The analytic components of the world of action discussed in the preceding apply to all three levels of analysis. Figure 2.2 shows the constitutional choice, collective choice, and operational levels of analysis and shows the same working parts in each level. Each section of the diagram includes attributes of institutional arrangements, events, community, the decision situation, and the individual decision maker. Each section also includes either symbolic or real action and aggregated results.

#### The World of Action

The first level of analysis is the world of action or the operational level, shown at the extreme right of the figure. Individuals functioning at this level either take direct action or adopt a strategy for future actions, depending on expected contingencies. Decisions in a market or in a tennis game occur at this level.

In a highly organized and free society, individuals are authorized to take a wide variety of actions at this level without prior agreement with other individuals. Authority derives from institutional arrangements, including property law, business and corporate law, and constitutional guarantees of individual freedom.

#### The World of Collective Choice

The second level of analysis, shown in the center of figure 2.2, is the world of collective decisions. Collective decisions are made by officials (including citizens acting as officials) to determine, enforce, continue, or alter actions authorized within institutional arrangements. Like individual strategies in the world of action, collective decisions are plans for future action. Unlike individual strategies, collective decisions are enforceable against nonconforming individuals. An individual failing to abide by a personal diet strategy, for example, may feel guilty, but no official has the power to enforce the diet plan. Officials have the power, however, to enforce a collective plan such as a city ordinance. City officials can impose sanctions against individuals who violate the ordinance. The authority to impose sanctions is a key attribute of the collective-choice level of decision making.

#### The World of Constitutional Choice

The third level, shown in the left section of figure 2.1, is the world of constitutional decision making. Constitutional decisions are collective choices

about rules governing future collective decisions to authorize actions. Constitutional choices, in other words, are decisions about decision rules. Organizing an enterprise is a constitutional decision about rules to constrain future collective choices within the enterprise. But constitutional choice also continues beyond the initial organizing period, for as individuals react to consequences of earlier rules for collective decision making, participants may change the rules to improve the result.

While components of the framework are similar across the three levels of analysis, attributes may vary in importance from one level to another. The framework, however, shows the potential for institutional models to explain a broad range of situations, with institutional arrangements linking each level of decision making to the next level. Constitutional decisions establish institutional arrangements and their enforcement for collective choice. Collective decisions, in turn, establish institutional arrangements and their enforcement for individual action.

#### Differences among the Levels of Decision Making

The decision at the operational level differs fundamentally from the decisions at the other two levels. But the case with which scholars have adapted similar analytical models to all three levels of decision making have masked this difference. *The operational level is the only level of analysis where an action in the physical world flows directly from a decision.* Individuals do not act directly upon decisions in the worlds of collective or constitutional choice. Decision makers, instead, select symbols conveying information about preferred future actions.

In the world of collective choice, decision makers select among proposals to authorize future actions or select among candidates for official positions in future collective choice situations. But the only immediate results from the decisions are symbolic expressions, like votes. Aggregated votes, then, produce a collective decision about a plan for future action or about the selection of public officials. The individuals making the collective decisions sometimes also undertake the actions authorized by the collective decision, but frequently, the collective decision makers are different individuals from those taking the authorized action. Legislators, for example, make collective decisions governing actions by administrative employees.

Another difference between the operational level and the other two levels of decision making is the role of implementation and enforcement. Figure 2.2 shows this difference by including a working part for implementation and enforcement in the constitutional and collective choice level but not in the operational level. Constitutional and collective decisions must be implemented and enforced to ensure controls over the world of action, although

analysts frequently assume that this aspect of political economy occurs automatically. Studies such as those by Pressman and Wildavsky (1973) illustrate the folly of such assumptions.

Our framework also calls attention to the distinction between constitutional and collective decision making. This is another point of confusion in political-economic literature. Writers frequently call both kinds of decisions "politics," missing the point that constitutional choices precede and constrain collective choices. Calling both kinds of decisions by the same name brings us, as Buchanan (1977, 71) asserts, "deep in the cardinal sin of using the same word, politics, to mean two quite different things, and indeed this double use has been one of the major sources of modern confusion."

Our tennis example illustrates the distinctions and the relationships among the three levels of analysis. The Intercollegiate Tennis Association determines the rules for college tennis. The association's members make up the community at the collective choice level of analysis, and individual representatives of the association members are the decision makers. The collective decision situation describes the alternatives and the consequences regarding the selection of rules for intercollegiate tennis.

Members of the association interact and representatives individually decide upon tournament rules. Representatives confront decision situations at the collective choice level, analogous to the tennis player deciding whether to charge the net or to play the baseline at the operational level. The representative makes the decision and voices that decision according to institutional arrangements at the collective choice level. These symbolic actions by the several representatives are then aggregated, again according to the institutional arrangement, into a collective decision. This collective decision becomes part of the rule configuration that constrains interaction among college tennis players in the future.

Imagine that the Intercollegiate Tennis Association must decide whether to raise the net by six inches for all intercollegiate tennis games after some future date. When deciding, association members will consider the makeup of the Intercollegiate Tennis Association (that is, the community), the constraint on the range of choices members can make (institutional arrangements), and the nature of the good over which the Intercollegiate Tennis Association members are interacting (the game or the event). The decision situation resulting from these three elements necessarily differs from decision situations regarding intercollegiate tennis at the operational level, because the elements shaping the decision situation change from one level to the next. The attributes of the good, for example, differ between the collective choice and operational levels of analysis. A tennis game, at the operational level, may be a private means for two rivals to challenge each other. At the collective choice level, tennis extends beyond a private matter between two players to matters involving

all members of the association. Tennis, at the collective choice level, becomes a joint consumption good.

### **Feedback Mechanism in the Three Worlds**

Feedback paths at the operational level also exist at the collective choice and the constitutional choice levels. Collective decisions resulting from the aggregated individual vote increase the shared experience of the community. The shared experience affects collective decision situations on subsequent rounds of the process. The results also affect the awareness of individual decision makers, causing them to vote differently in subsequent rounds.

Feedback paths also cross the levels of analysis. The representation of the linkages can become quite complex, depending on the channel of the feedback. The feedback may be as simple as having the distribution of outcomes at the operational level change the attributes of the individual member who participates in the collective choice. On the other hand, the feedback may be complex, working through an individual who participates in the operational decision situation and later pressures other individuals at the collective choice level to alter their decisions. This individual, then, operating at a collective choice level by voting for members of the Intercollegiate Tennis Association or otherwise pressuring the members of the association, helps produce a collective decision that affects the attributes of the individual member of the association. Perhaps the combined pressure from a number of disgruntled players makes the association member more aware of the outcomes of a particular tennis rule and causes the member to vote differently in future collective choice situations regarding the troublesome rule.

The rules that govern the collective choice situation are determined at the third level of political-economy framework in the constitutional choice situation. The constitutional level determines the formal composition of the collective choice body and how the members of the body are selected. The constitutional level determines the issues that the collective choice body can address and how the body can address those issues. The constitutional level determines the relationship among the members of the collective choice body.

Individual administrators and members of athletic departments in a wide variety of colleges and universities with potential for playing intercollegiate tennis can form a body to establish an Intercollegiate Tennis Association. The members of that body have to construct the association, determining its size, how the members of the association are to be selected, the responsibilities of the association, and how the association is to function. Decisions regarding each one of these aspects about the association must be made by individuals in the constitutional body functioning in a constitutional choice situation.

That constitutional choice situation, as at other levels of analysis, is determined by the composition of the community from the colleges and universities interested in forming an Intercollegiate Tennis Association, the rules governing the interaction that will establish the Intercollegiate Tennis Association, and the good that intercollegiate tennis represents. The schools may agree that all interested schools have one vote in the constitution of the association or that the larger universities have more votes in constituting the association than the smaller colleges. The members may bar some schools from participating in the constitutional level of choice.

The good may be seen as competition among various colleges and universities, of which tennis is only one part of that competition. The schools may be interested in establishing contact and rivalry with each other in a variety of ways and see the constituting of a tennis association as a means to begin that rivalry. They foresee this rivalry and contact as eventually spilling over into other sports and into academic areas.

This view of the good, combined with the limits on the schools that can participate in the constitutional choices and the rules that govern the constitutional choice process, determines the choice situation that each individual participating in constitutional choices confronts. Change the representation by the schools from heavy influence by administrators to heavy influence by athletic departments, and the alternatives open to individual choice makers will change. Change the good from an attempt to foster contact and rivalry among the schools to an attempt to increase the fund-raising potential of the various schools, and the choice situations confronting the individual choice makers will change. Changes in these working parts of the system will reverberate through the redesign of the Intercollegiate Tennis Association, through changes in the rules governing the play of intercollegiate tennis, through changes in the decision situation that encourages charging the net to a situation that encourages playing the baseline, to less aggressive games in intercollegiate tennis.

Feedback occurs within the constitutional level of analysis, as it does within the other levels. Individuals participating in the design of institutional arrangements make a choice regarding a rule within the institutional configuration on the basis of certain levels of knowledge and awareness about the consequences of alternative votes. The aggregation of individual votes on the rule alternatives is a constitutional decision, which may be a consequence that the individual voter did not expect, given the constitutional choice situation. But having gone through the process, the individual is now more aware of the relationships among the alternatives up for vote and the likely consequences. In similar rounds in the future at the constitutional level, that individual could vote differently because of this new level of awareness.

A participant from one of the small colleges in the process of constructing the Intercollegiate Tennis Association may learn from a vote about the representation on the association that the large universities are agreeing on a united position before the vote. In the meantime, the smaller colleges entered the vote with little foreknowledge of each other's preferences and no agreement among themselves on a position to take. The result is a rule that gives the universities disproportionately heavy representation in the association. The participant from the small college may have expected that the universities would be more heavily represented but not by as much as the actual constitutional decision allowed. On the next vote college participants may circulate proposals prior to a meeting with each other and work out a united position before the vote. On a similar issue, the individual's vote this time is different, even though the constitutional choice situation may be similar to the first situation.

Feedback also crosses from one level to the next. Figure 2.2 shows that outcomes at the operational level can feed back to the individual participating at the collective choice level and to the individual participating at the constitutional choice level. These individuals may or may not be the same individual as the one who decides at the operational level, and even when the three individuals are the same individual, the attributes that are brought to bear on the choice situation at the three levels may be very different. In effect, the individual enters the choice situations at the three levels as though the individual were three different individuals.

Figure 2.2 and this discussion purposely keep the linkages among the three levels of analysis and the feedback routes simple. The levels and their interrelationships are often very complicated. The decision situation will often be affected simultaneously by the rules of many institutional arrangements, rather than one arrangement as represented in figures 2.1 and 2.2. The rule, for example, that a tennis player cannot shoot and kill an opposing player because he charges the net or otherwise plays aggressively comes from a state government rather than the Intercollegiate Tennis Association. Thus, more than one set of collective choices bears upon the decision situation at the operational level. Moreover, each set of collective choices is made within the rules of different constitutions.

Another complication is the problem of deciding where to stop adding levels to figure 2.2. Even at the constitutional choice level, there are rules that affect the choice situation. Thus, some means of determining those rules must exist. That is, there must be a preconstitutional level and a pre-preconstitutional level. The problem is the one of infinite regress that Buchanan and Tullock (1962) speak of in *The Calculus of Consent*, when they begin their analysis at the constitutional level with the rule of unanimity.

Such complications, however, add little to the explanatory and predic-

tive powers of the framework, only serving to make it more cumbersome. We are trying here to provide a framework to enable scholars to understand the bare bones of this approach. Once this minimal structure is understood, the analyst can proceed to add still more complexity to the framework.

### Conclusion

In this essay we have taken an ecumenical rather than a parochial view of a family of theories that all use the individual as a basic unit of analysis. These theories examine the effect of institutional arrangements on the decision situations in which individuals act, producing results for themselves and others. The number of variables and complex linkages involved when scholars attempt to develop and test theories of institutions has confused many pursuing the attempt as well as their readers. The schematic framework presented above develops what we consider to be the essential elements and key linkages among three levels of analysis—constitutional, collective, and operational—and within any one of these levels. It is our hope that this metatheoretical approach helps scholars to understand the working parts of theories that have the surface appearance of being totally unrelated.

Using this framework, neoclassical economics can be viewed as a particular theory focusing primarily on the world of action. The definition of the individual used is relatively narrow. The decision situation constituted by institutional arrangements, goods, and community is limited in scope and presents individuals with little real choice. Tight linkages between individual actions and group results exist and are easy to understand for participants as well as observers. Analytical methods have been successful in predicting results when real-world situations closely resemble the highly limited situations posited by the theory.

The assumptions developed in neoclassical economics about the individual are the gears that drive the analytical machine. Because of this, many have viewed the assumptions as having an independent existence of their own, unrelated to the assumptions made about the other working parts of a particular theory. Thus, considerable work in political science has adopted the narrowly defined model of the individual used in neoclassical economics as “the” definition of a rational individual, no matter what type of situation is being modeled. However, we would argue that it is the nature of the situation being modeled that produces the opportunity to model the individual in this narrow fashion. The competitive market as modeled produces highly specific information about prices sufficient for an individual to have complete information. But complete information in this case is focused on one piece of information—current market price.

We see no reason to assume that the specific model of the individual that

has been so successful as part of a particular theory should be as successful an analytic device when picked up and thrust into theories attempting to explain dramatically different types of decision situations. In a legislature or an election, the number of relevant variables, the degree of direct effect on participants, the level of information, and the tightness of the linkage structure all differ substantially from a market.

As Boynton (1982) points out, all theories specify relationships between some variables under well-defined conditions. The conditions of the competitive market are well specified and describe only a small segment of the decision situation one could analyze using the framework presented above. Under these conditions, analytical solutions can be derived that have nice equilibrium properties. Because of the type of institutional arrangements, goods, and community, the constituted decision situation in a competitive market can be modeled as relatively mechanistic.

Theories that apply this framework to other types of decision situations may attempt to gain analytical solutions but will frequently lose explanatory power as a result of the unreality of the assumptions needed to drive analytical solutions. To assume that individuals perform calculation processes requiring high levels of information when they are acting in uncertain environments may lead to the formulation of beautiful analytical models that are empirically irrelevant. A major question to be pursued is how institutional arrangements help to structure decision situations in complex arenas so that individuals are able to achieve productive outcomes even when we cannot derive analytic solutions. If we limit the way we model individuals and situations to those models that have been successful in explaining market behavior, we may continually fail to show how *different* institutional arrangements help fallible and less than fully informed persons to achieve relatively satisfactory outcomes.

### NOTES

1. The extent of closeting institutional variables is illustrated in examining the table of contents and index of Dahl and Lindblom's major study, *Politics, Economics and Welfare* (1953). The term *institution* does not appear in any form in the contents or index. The term *law* appears in the index paired with the term *command*, and two pages are cited—both of which focus on a sociological definition of the power of a leader to command the performance of a subordinate. The term *rule* is paired in the index with the term *regulation*. The three pages cited all discuss bureaucratic rules and regulations as conceptualized as *red tape*. It is difficult to contemplate how difficult it must have been to do a comparative study of markets, voting, and hierarchical decision mechanisms without examining self-consciously the rule systems affecting these different processes.

2. Commons (1959, 54) recognized that the predictability of behavior depended both on the willingness of participants to follow rules as ethical systems and on the probability that officials will enforce their claims to rights if remedial action was requested. He articulated both in the following way.

Now the distinction between ethical rights and duties and legal rights and duties is the distinction between two causes of probability respecting human conduct. Legal rights and duties are none other than the probability that officials will act in a certain way respecting the claims that citizens make against each other... But there is also an ethical ideal not relating directly to the state, and an ethical probability. In most of the transactions of modern society respecting the rights of property, liberty, domestic relations, and so on, scarcely one transaction in a billion gets before the courts or in the hands of public officials. These ethical transactions are guided, nevertheless, to an indefinite extent, by the probabilities of official behavior, but the bulk of transactions are on an ethical level guided by ethical ideals considerably above the minimum legal probabilities of what officials will do.

3. For a classification of rules for the purpose of identifying whether the rules relate solely to (1) interactions among individuals, (2) relations of individuals to objects, or (3) relations among individuals with respect to objects, see Montias (1976, 24–25). Douglas Rae (1971) partially classified institutional rules for the purpose of asking how they might contribute to the degree of political democracy within a system.

4. Recent work in experimental economics is extremely important for the purpose of isolating the effect of specific institutional rules on the type of behavior adopted and results produced in controlled decision situations. See Smith (1978); Coppinger, Smith, and Titus (1980); and Cox, Robertson, and Smith (1981).

5. This section draws heavily on V. Ostrom and E. Ostrom (1977a). See also the discussion in Benjamin (1982).

## REFERENCES

- Aristotle (1962) *The Politics*. Baltimore: Penguin.
- Alchian, A. A. and H. Demsetz (1972) "Production, information costs, and economic organizations." *American Economic Review* 62, 5: 777–95.
- Arrow, K. (1966) *Social Choice and Individual Values* (2d ed.). New York: John Wiley.
- . (1969) "The organization of economic activity: issues pertinent to the choice of market versus nonmarket allocation," in *The Analysis and Evaluation of Public Expenditures: The PPB System*. Washington, DC: U.S. Congress, Joint Economic Committee, Subcommittee on Economy in Government.
- Auster, R. D. and M. Silver (1979) *The State as a Firm: Economic Forces in Political Development*. Boston: Martinus Nijhoff.
- Becker, G. S. (1976) *The Economic Approach to Human Behavior*. Chicago: University of Chicago Press.
- Benjamin, R. (1982) "The Historical Nature of Social-Scientific Knowledge: The Case of Comparative Political Inquiry," 69–98 in E. Ostrom (ed.) *Strategies of Political Inquiry*. Beverly Hills, CA: Sage Publications.
- Black, D. (1958) *The Theory of Committees and Elections*. Cambridge, MA: Cambridge University Press.
- Blumstein, J. (1981) "The resurgence of institutionalism." *Journal of Policy Analysis and Management* 1, 1: 129–32.
- Borcherding, T. E. (ed.) (1977) *Budgets and Bureaucrats*. Durham, NC: Duke University Press.
- Boulding, K. E. (1963) "Towards a pure theory of threat systems." *American Economic Review* 53, 2: 424–34.
- Bowen, H. R. (1943–44) "The interpretation of voting in the allocation of economic resources." *Quarterly Journal of Economics* 58 (November): 27–48.
- Boynton, G. R. (1982) "On Getting from Here to There: Reflections on Two Paragraphs and Other Things," 29–68 in E. Ostrom (ed.) *Strategies of Political Inquiry*. Beverly Hills, CA: Sage Publications.
- Brunner, K. and W. H. Meckling (1977) "The perception of man and the conception of government." *Journal of Money, Credit and Banking* 9, 1 (Pt. 1): 70–85.
- Buchanan, J. M. (1970) "Public goods and public bads," 51–71 in J. P. Crecine (ed.) *Financing the Metropolis*. Beverly Hills, CA: Sage Publications.
- . (1972) "Towards analysis of closed behavioral systems," in J. M. Buchanan and R. D. Tollison (eds.) *Theory of Public Choice. Political Applications of Economics*. Ann Arbor: University of Michigan Press.
- . (1975) "Individual choice in voting and the market." *Journal of Political Economy* 62, 3: 334–43.
- . (1977) *Freedom in Constitutional Contract: Perspectives of a Political Economist*. College Station: Texas A&M University Press.
- . and G. Tullock (1962) *The Calculus of Consent: Logical Foundations of Constitutional Democracy*. Ann Arbor: University of Michigan Press.
- Caves, R. (1977) *American Industry: Structure, Conduct, and Performance* (4th ed.). Englewood Cliffs, NJ: Prentice-Hall.
- Coase, R. H. (1937) "The nature of the firm." *Economica* (new series) 4, 16: 386–405.
- Coleman, J. (1973) *The Mathematics of Collective Action*. Chicago: Aldine.
- Commons, J. R. (1950) *The Economics of Collective Action*. New York: Macmillan.
- . (1959) *Legal Foundations of Capitalism*. Madison: University of Wisconsin Press.
- Coppinger, V., V. L. Smith, and J. Titus (1980) "Incentives and behavior in English, Dutch, and sealed-bid auctions." *Economic Inquiry* 18 (January): 1–22.
- Cox, J. C., B. Robertson, and V. L. Smith (1981) "Theory and behavior of single object auctions." Tucson: University of Arizona.
- Dahl, R. A. and C. E. Lindblom (1953) *Politics, Economics, and Welfare, Planning, and Politics—Economic Systems Resolved into Basic Social Processes*. New

- York: Harper & Row.
- Downs, A. (1957) *An Economic Theory of Democracy*. New York: Harper & Row.
- (1967) *Inside Bureaucracy*. Boston: Little, Brown.
- Elster, J. (1979) *Ulysses and the Sirens*. New York: Cambridge University Press.
- Farquharson, R. (1969) *Theory of Voting*. New Haven, CT: Yale University Press.
- Hamburger, H. (1979) *Games as Models of Social Phenomena*. San Francisco: Free-man.
- Head, J. G. (1962) "Public goods and public policy." *Public Finance* 17, 3: 197–219.
- Hirschman, A. O. (1970) *Exit, Voice, and Loyalty. Responses to Declines in Firms, Organizations, and States*. Cambridge, MA: Harvard University Press.
- Hurwicz, L. (1973) "The design of mechanisms for resource allocation." *American Economic Review* 63, 2: 1–30.
- Jensen, M. C. and W. H. Meckling (1976) "Theory of the firm: managerial behavior, agency costs and ownership structure." *Journal of Financial Economics* 3, 4: 305–60.
- Katz, D. and R. L. Kahn (1966) *The Social Psychology of Organizations*. New York: John Wiley.
- Kirzner, I. M. (1973) *Competition and Entrepreneurship*. Chicago: University of Chicago Press.
- Knight, F. H. (1921) *Risk, Uncertainty, and Profit*. New York: Houghton Mifflin.
- (1965) *Freedom and Reform*. New York: Harper & Row.
- Kramer, G. H. and J. Hertzberg (1975) "Formal theory," 351–404 in F. L. Greenstein and N. W. Polsby (eds.) *Handbook of Political Science*. Reading, MA: Addison-Wesley.
- Leibenstein, H. (1976) *Beyond Economic Man*. Cambridge, MA: Harvard University Press.
- Luce, R. and H. Raiffa (1957) *Games and Decisions: An Introduction and Critical Survey*. New York: John Wiley.
- March, J. G. (1978) "Bounded rationality, ambiguity, and the engineering of choice." *Bell Journal of Economics* 9, 2: 587–608.
- and H. A. Simon (1958) *Organizations*. New York: John Wiley.
- Marschak, J. (1968) "Economics of inquiring, communicating, deciding." *American Economic Review* 58 (May): 1–18.
- Montias, J. M. (1976) *The Structure of Economic Systems*. New Haven, CT: Yale University Press.
- Mueller, D. C. (1979) *Public Choice*. Cambridge, MA: Cambridge University Press.
- Musgrave, R. A. (1959) *The Theory of Public Finance: A Study in Public Economics*. New York: McGraw-Hill.
- Niskanen, W. A. (1971) *Bureaucracy and Representative Government*. Chicago: Aldine.
- Olson, M. (1965) *The Logic of Collective Action. Public Goods and the Theory of Groups*. Cambridge, MA: Harvard University Press.
- Ostrom, V. (1976) "Some paradoxes for planners: human knowledge and its limitations," 243–54 in A. L. Chickering (ed.) *The Politics of Planning: A Review and Critique of Centralized Economic Planning*. San Francisco: Institute for Contemporary Studies.
- (1980) "Artisanship and artifact." *Public Administration Review* 40, 4: 309–17. (Reprinted in Michael D. McGinnis, ed., *Polycentric Governance and Development* [Ann Arbor: University of Michigan Press, 1999].)
- (1987) *The Political Theory of a Compound Republic*. San Francisco, CA: ICS Press.
- (1989) *The Intellectual Crisis in American Public Administration*. 2d ed. Tuscaloosa: University of Alabama Press.
- and T. Hennessey (1975) *Conjectures of Institutional Analysis and Design: An Inquiry into Principles of Human Governance*. Bloomington: Indiana University, Workshop in Political Theory and Policy Analysis.
- Ostrom, V. and E. Ostrom (1977a) "Public goods and public choices," 7–49 in E. S. Savas (ed.) *Alternatives for Delivering Public Services. Toward Improved Performance*. Boulder, CO: Westview. (Reprinted in Michael D. McGinnis, ed., *Polycentricity and Local Public Economies* [Ann Arbor: University of Michigan Press, 1999].)
- (1977b) "A theory for institutional analysis of common pool problems," 157–72 in G. Hardin and J. Baden (eds.) *Managing the Commons*. San Francisco: Freeman.
- Parks, R. B. et al. (1981) "Consumers as coproducers of public services: some economic and institutional considerations." *Policy Studies Journal* 9, 7: 1001–11. (Reprinted in Michael D. McGinnis, ed., *Polycentricity and Local Public Economies* [Ann Arbor: University of Michigan Press].)
- Popper, K. R. (1967) "La rationalité et le statut du principe de rationalité," 145–50 in E. M. Classen (ed.) *Les Fondements Philosophiques des Systèmes Économiques: Textes de Jacques Rueff et Essais Redigés en son Monneur 23 aout 1966*. Paris: Payot.
- Pressman, J. L. and A. B. Wildavsky (1973) *Implementation: How Great Expectations in Washington Are Dashed in Oakland*. Berkeley: University of California Press.
- Rae, D. W. (1971) "Political democracy as a property of political institutions." *American Political Science Review* 65, 1: 111–19.
- Riker, W. H. (1980) "Implications from the disequilibrium of majority rule for the study of institutions." *American Political Science Review* 74, 2: 432–45.
- and P. C. Ordeshook (1973) *An Introduction to Positive Political Theory*. Englewood Cliffs, NJ: Prentice-Hall.
- Ross, S. A. (1973) "The economic theory of agencies: the principal's problem." *American Economic Review* 63, 2: 134–39.
- Samuelson, P. A. (1954) "The pure theory of public expenditure." *Review of Economics and Statistics* 36 (November): 387–89.
- (1955) "Diagammatic exposition of a theory of public expenditure." *Review of Economics and Statistics* 37, 4: 350–56.
- Savas, F. S. (1978) "The institutional structure of local government services: a conceptual model." *Public Administration Review* 38, 5: 412–19.
- Schelling, T. C. (1978) *Micromotives and Macrobbehavior*. New York: Norton.

- Sen, A. K. (1970) *Collective Choice and Social Welfare*. San Francisco: Holden-Day.
- Shepsle, K. A. (1974) "Theories of collective choice," 1–87 in C. P. Cotter (ed.) *Political Science Annual* (Vol. 5). Indianapolis: Bobbs-Merrill.
- (1979) "Institutional arrangements and equilibrium in multidimensional voting models." *American Journal of Political Science* 23: 27–59.
- and B. R. Weingast (1981) "Political preferences for the pork barrel: a generalization." *American Journal of Political Science* 25, 1: 96–111.
- Shubik, M. (1959) *Strategy and Market Structure: Competition, Oligopoly, and the Theory of Games*. New York: John Wiley.
- (1975) "Oligopoly theory, communication, and information." *American Economic Review* 65 (May): 280–83.
- Simon, H. A. (1957) *Models of Man: Social and Rational*. New York: John Wiley.
- (1972) "Theories of bounded rationality," in C. McGuire and R. Radner (eds.) *Decision and Organization*. Amsterdam: Elsevier North Holland.
- (1978) "Rationality as process and as product of thought." *American Economic Review* 68, 2: 1–16.
- Simon, H. A. (1981) *The Sciences of the Artificial* (2d ed.). Cambridge, MA: MIT Press.
- Smith, V. L. (1976) "Experimental economics: induced value theory." *American Economic Review* 66 (May): 274–79.
- (1978) "Experimental mechanisms for public choice," 323–55 in P. C. Ordeshook (ed.) *Game Theory and Political Science*. New York: New York University Press.
- Taylor, M. (1976) *Anarchy and Cooperation*. New York: John Wiley.
- Thaler, R. H. and H. M. Sheffrin (1981) "A theory of self-control." *Journal of Political Economy* 89, 2: 392–406.
- Tullock, G. (1965) *The Politics of Bureaucracy*. Washington, DC: Public Affairs Press.
- Williamson, O. E. (1975) *Markets and Hierarchies: Analysis and Anti-Trust Implications. A Study in the Economics of Internal Organizations*. New York: Macmillan.

## CHAPTER 3

### An Agenda for the Study of Institutions

*Elinor Ostrom*

#### 1. The Multiple Meanings of Institutions

Recently, public choice theorists have evidenced considerable interest in the study of institutions. William Riker (1982, 20) recently observed, for example, that "we cannot study simply tastes and values, but must study institutions as well." Little agreement exists, however, on what the term *institution* means, whether the study of institutions is an appropriate endeavor, and how to undertake a cumulative study of institutions.

Riker defines institutions as "rules about behavior, especially about making decisions" (1982, 4). Charles Plott also defines institutions to mean "the rules for individual expression, information transmittal, and social choice..." (1979, 156). Plott uses the term *institutions* in his effort to state the fundamental equation of public choice theory. Using  $\oplus$  as an unspecified abstract operator, Plott's fundamental equation is

$$\text{preferences} \oplus \text{institutions} \oplus \text{physical possibilities} = \text{outcomes} \quad (1)$$

Plott himself points out, however, that the term *institution* refers to different concepts. He ponders:

Could it be, for example, that preferences and opportunities *alone* determine the structure of institutions (including the constitution)? These questions might be addressed without changing "the fundamental equation" but before that can be done, *a lot of work must be done on deter-*

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Originally published in *Public Choice* 48 (1986): 3–25. Copyright © 1986 by Kluwer Academic Publishers. Reprinted with kind permission of Kluwer Academic Publishers and the author.

Author's note: This essay was delivered as the presidential address at the Public Choice Society meetings, Hilton Hotel, Phoenix, Arizona, March 30, 1984. I appreciate the support of the National Science Foundation in the form of Grant No. SES 83–09829 and of William Erickson-Blomquist, Roy Gardner, Judith Gillespie, Gerd-Michael Hellstern, Roberta Herzberg, Larry Kiser, Vincent Ostrom, Roger Parks, Paul Sabatier, Reinhard Selten, Kenneth Shepsle, and York Willbren, who commented on earlier drafts.