Converting Threats into Opportunities

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James Madison contributed much to political science and to the art and science of governing democratic regimes. A major contribution was his recognition of the multiple threats facing the newly established Confederation (see, e.g., Dougherty 2001). Madison was willing to invest heavily in converting these threats into new opportunities. In his "Preface to Debates in the Convention" ([1984] 1840, 19), Madison reflected on the causes for alarm:

> The failure however of the varied propositions in the Legislature, for enlarging the powers of Congress, the continued failure of the efforts of Congs. to obtain from them the means of providing for the debts of the Revolution; and of countervailing the commercial laws of G. B., a source of much irritation & agst. which the separate efforts of the States were found worse than abortive; these Considerations with the lights thrown on the whole subject, by the free & full discussion it had undergone led to a general acquiescence in the Resoln. passed, on the 21. of Jany. 1786, which proposed & invited a meeting of Deputies from all the States.

Madison devoted substantial effort to doing a deep analysis of prior efforts to design robust democratic systems as well as actively participating in the Convention (while keeping extensive—almost verbatim—notes). Upon the completion of the Convention, he contributed key essays to *The Federalist Papers* as the major effort to articulate the logic of the new Constitution for those who would be deciding on its fate and for all of us who have studied these essays as a core foundation of democratic theory.

As a deep student of political life, Madison was among the most articulate theorists to warn of the mortal diseases that threaten all popular government. Factions are the most threatening of these diseases. In *Federalist* 10, Madison defined a faction as "a number of citizens, whether amounting to a majority or minority of the whole, who are united and actuated by some common impulse of passion, or interest, adverse to the rights of other citizens, or to the permanent and aggregate interests in the community" (p. 78). As a man of conviction, Madison fought hard for the constitutional provisions that he thought would alleviate the threats facing the nation. He then gave unstinting support to the new Constitution and articulated its principles in the *Federalist Papers* along with Alexander Hamilton and John Jay (with whom he had previously disagreed on key issues). The final product differed substantially from the Virginia plan presented by Madison at the beginning of the Convention. Nevertheless, he refused to organize a faction against the new Constitution (even though he expressed pessimism about it in private correspondence [see Robertson 2005]). Madison joined in a spirited defense of the effort he saw as a necessary step to convert the threats to the long-term stability of the new nation into opportunities to move ahead with a more successful mode of operation.

Madison also recognized that the "latent causes of faction are sown in the nature of man" (p. 79). It would be "worse than the disease" to try to destroy the liberty that is essential to the expression of diverse views. Rather than destroy differences of views, the challenge for Madison was how to design institutions so humans could learn from debate while not allowing any one group to impose its will on others who oppose it.

Madison understood that the world he knew was undergoing major changes in its underlying structure. He saw that it was necessary to learn from past history, to engage in vigorous deliberation about how to avoid the threats confronting a young nation, and to avoid participating in a faction against the new Constitution even though he opposed some of the sections that were included in it. Political scientists are also in an era that presents many threats and challenges to our discipline. We shall not overcome these threats unless we confront them, engage in serious deliberation about how to convert them to opportunities, and change some of the ways of interacting with one another and with our subject matters.

Those engaged in the Perestroika movement have generated some healthy debates about the current state of political science (see Monroe 2005) as did those who were earlier involved in the Caucus for a New Political Science. Many thoughtful scholars of our times have also warned of threats to the future development of social sciences more broadly that are of considerable relevance to political science. If we confront the threats we face, we may be able to strengthen our overall abilities as a discipline to understand and contribute to the increasingly volatile world in which we live. This is our opportunity—let us not pass it by.

Many current challenges to the discipline of political science, if ignored, could weaken our capabilities to understand and explain political phenomena in a cumulative scientific manner and to offer useful policy advice for the constitution of democratic regimes at multiple levels in an ever-changing world. Let me introduce four of these disciplinary threats here and then spend some time on each.

- ***The excessive energy devoted to factional fights***. Given the vast domain of our subject matter, we do need to specialize and focus on particular questions or fields of analysis. On the other hand, we need to avoid spending so much energy on trying to show that one approach is right and the others are wrong (or even evil). Name-calling does not create an environment where genuine learning from deliberation can occur.
- ***The counterproductive search for universal laws of human behavior***. Some of those who believe that they have found general laws are willing to write off all other approaches to our discipline as non-science (or, even at times, non-sense). There are those who would argue that political

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science is a quixotic misnomer and that our task is to help understand specific contexts and help reform them (Flyvbjerg 2001). Some of the rest of us see the enterprise as identifying common building blocks for doing theoretical analysis at multiple levels and scales of analysis. The basic difference between the social world and the biophysical world is that the biophysical world exists whether or not humans reflect on it, but the social world is constituted by human thought, language, and action. Given the importance of language, a more serious threat to the future of our discipline than the lack of universal laws is our lack of common definitions for key terms we use including power, norms, and institutions. Can we ever escape from the "Tower of Babble" that we have created?

- ***The validity (or, for some, the morality) of using rational choice models of individual choice.*** There are many rigid defenders and attackers of the narrow neoclassical model of rational choice. Many of the attacks focus on a caricature of what was initially introduced into our discipline from economics a half-century ago. Currently, a vigorous effort is underway to broaden this theoretical tool so that it is a useful foundation for analyzing behavior outside of the highly competitive, repetitive, and static situations in which it was developed and will continue to be used. It is as much a threat to further understanding of human behavior to hold onto a narrow model that has been shown repeatedly to fail in prediction and explaining behavior outside of highly competitive settings as it is to reject all work that is broadly characterized as "rat choice," whether or not it is conducted by the very scholars who are broadening the tool in light of empirical research.
- ***The tendency to focus on one level of government and to ignore other disciplines.*** We tend to narrowly focus on what happens in national government and not how government decisions affect and are affected by the biophysical environment as well as the citizens living in a society and the other scales and means of governance. Political science has, in the past, borrowed and gained much from history, economics, and literary studies. We have much more still to learn from ecology, geography, cultural history, and recent developments in evolutionary theory by anthropologists, economists, and psychologists as well as members of our own discipline. We also need to reach out to participate in, as well as study, the ever-changing political world around us.

Now let me discuss these challenges.

Factionalism versus Recognizing the Strength of Multiple Methods

Many members of our discipline study different topics using a wide diversity of methods. Instead of recognizing the strength that this could give us, many departments and the discipline at large have devoted substantial energy to factional (in the sense that Madison meant) fights. The recent Perestroika challenge has generated many positive reactions to the flurry of open debate with participants on all sides communicating mostly in an open problem-solving manner (see Sigelman 2005; Alker 2005; and responses in Monroe 2005). Some earlier exchanges did not have such a friendly, out-reaching orientation (Niou and Ordeshook 1999). Hopefully, in addition to the debate, we will continue to develop further efforts to build on the diverse research methodologies used by political scientists to study diverse questions.

What is important along the way, however, is that we do not slip from "my research methods is the best and only" to "anything goes." Every research method can be undertaken with rigor or sloppily. Let us not confuse a sloppy case study, survey, or game-theoretical analysis with what we can learn from all of these approaches when undertaken with care and conclusions are modestly framed. Campbell, Stanley, and Gage (1966) have provided us all with a thoughtful recognition that every research method faces threats to internal or external validity (or both). King, Keohane, and Verba (1994) stress that research design issues are essential and have strong similarities regardless of the particular method we use. Michael Coppedge (1999) has illustrated how case studies offer an opportunity to examine the internal logic posited by theorists by tracing the causal processes that occur in one or several well-chosen case studies (see also Campbell 1975). The method of "analytical narratives" has demonstrated the feasibility of bridging and blending formal theory with in-depth case studies (Bates et al. 1998). In light of her own extensive research, Barbara Geddes (2004) shows how study site selection, as well as the type of methods used, strongly affect results. We need to stop name-calling or arguing that there are only a few acceptable methods for our discipline and get to work on serious studies that blend the methods we use (see, e.g., the important reconciliation of two traditions by Dryzek and List 2003).

Perhaps I can illustrate how one can build a research program that builds on the strength of multiple methods. Amy Poteete, Marco Janssen, and I are in the early stages of a book with the working title of *Multiple Methods for Analyzing Collective-Action Theory*.[1] Our central question is: What have we learned about the theory of collective action in regard to the governance of common-pool resources (CPRs) since the challenge issued by Garrett Hardin (1968)? Hardin posited that all users of a commons were helplessly trapped in a causal process leading to overuse, if not destruction, of the very resources on which they were dependent.

Hardin's theory posited that it was *impossible* for resource users themselves to overcome the collective-action problem they faced. Only two solutions existed—the first, impose government ownership and the second, impose private ownership. Case studies are an excellent first step in examining the validity of that theory. When a theory asserts that X is impossible, finding a single case where X occurs negates the theory. Many more than one case study challenged this "impossibility theorem." A large number of case studies were written by historians, anthropologists, ecologists, as well as the full array of social scientists, describing how multiple groups of users overcame the tragedy in relationship to pastures (Hardin's hypothetical case), forests, irrigation systems, and inshore fisheries (see NRC 1986; Workshop CPR Library at www.indiana.edu/~workshop/wsl/index.html). Further, many scholars also found that government-imposed ownership as well as imposed private solutions had not uniformly worked as optimally as Hardin had posited.

Case studies did not establish that users *always* crafted rules to overcome commons dilemmas or that government-imposed ownership or privatization *always* failed. Rather, case studies strongly challenged Hardin's strong derivation of impossibility (that had been backed up by formal models of CPR settings consistent with Hardin) and the necessity of government ownership or privatize ownership. Initially, it was case studies that provided the essential challenge to a theory that appealed widely to policy analysts, ecologists, and government officials around the world.[2]

Once case studies had refuted Hardin's impossibility theorem, however, an even

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larger task arose: how to construct an explanation that would be useful in distinguishing between the cases in which common-pool resources survived and the cases where they had been degraded or destroyed. Given the large number of case studies written by researchers who knew the local history and culture, ecology, and the actions of key actors, two forms of meta-analysis appeared to be the next reasonable step.

In my *Governing the Commons* (1990), I picked a set of cases that met several criteria (relatively small and contained, local resources with a very long history) so that I could examine the factors that appeared to account for the robustness of some systems and the failure of others. The number of specific variables that I encountered in examining these cases was overwhelming (and was concurrently dealt with by the second form of meta-analysis described below). Thus, I tried to account for the robustness of long-surviving systems by a set of eight "design principles" that were consistent with the robust systems. I also developed a flowchart causal model identifying broad variables related to the resource, the resource users, and their autonomy to make and enforce their own rules to begin the theoretical effort to explain why some systems did govern themselves while others overharvested, as Hardin had predicted. Many scholars have now undertaken formal analyses of common-pool resource games to understand how findings from the cases could be analyzed using game theory (see Faysse 2005 for an excellent review).

At the same time, a group of colleagues (Arun Agrawal, Bill Blomquist, Edella Schlager, and S. Y. Tang) and I read hundreds of case studies written by other scholars. After extended discussions and many attempts, we created a coding form that Schlager used to code 30 inshore fishery cases and Tang used to code 39 irrigation systems. That analysis is brought together with that of Agrawal, who drew on his own fieldwork in six forest communities in India, and Bill Blomquist, who compared three groundwater basins in Southern California (see E. Ostrom, Gardner, and Walker 1994). We found that all of the self-organized common-pool resource systems shared four characteristics: (1) presence of at least one well-defined boundary rule, (2) presence of various choice rules related to allocating resource units, (3) active monitoring and sanctioning by local users, and (4) no use of the grim-trigger mechanism posited by game theorists to be a solution to repeated dilemma situations (Blomquist et al. 1994, 301). We also found that resource systems characterized by relatively stationary resource units and storage capacities were more likely to self-organize (Blomquist et al. 1994, 308–309; see also Schlager, Blomquist, and Tang 1994).

But a further theoretical task remained: whether explanations constructed *ex post facto* to account for past cases possessed any predictive capability that would stand up to new situations. Our group was fortunately joined by Roy Gardner, a game theorist, and Jimmy Walker, an experimentalist. This enabled us to go back and forth from reading individual case studies, doing the meta-analysis as well as original fieldwork, to develop game-theoretical models of what we thought we were observing, and to create simplified common-pool resource experiments in the lab. In the first set of lab experiments, we were able to show that Hardin's theory roughly predicts outcomes when participants are truly trapped by an imposed requirement of no communication.[3] Simply allowing subjects to engage in face-to-face communication (called cheap talk in game theory), which had been predicted to have *no* difference in any social dilemma situation, enables all groups to improve outcomes. Some groups come very close to optimal solutions after engaging in face-to-face communication.

Achieving the control that is feasible only in well-crafted experiments, where one actually knows what the optimal outcome is (which one rarely knows in the field), gained for us a method strong in regard to internal validity to complement the external validity achieved by our other methods. Laboratory experiments also allowed us to examine a frequent phenomenon that I had observed in the field (and read about in the case studies). Resource users, who had crafted their own rules (a second level collective-action problem), were frequently ready to enforce those rules at a cost to themselves (a third level collective-action problem)! We could test that field observation carefully in the lab. We found the same willingness to pay a personal cost to impose a sanction on those who deviated from agreements (see E. Ostrom, Walker, and Gardner 1992). To explain the diverse findings from our research, we posited that users developed heuristics in the sense of bounded rational participants rather than continuing to use a thin model of rationality.

We have also developed two large-N field studies. The first is of 231 irrigation systems in Nepal characterized by very substantial variation in ecology and the cultural history of local peoples (see Shivakoti and Ostrom 2001; Joshi et al. 2000; Lam 1998; Regmi forthcoming). The second is an over-time study of more than 200 forests located in 12 countries to examine the impact of diverse forest institutions on forest users and official behavior as well as on measured attributes of forest conditions (e.g., extent, basal area, biodiversity, etc.) (see Gibson, McKean, and Ostrom 2000; Gibson, Williams, and Ostrom 2005; Tucker and Ostrom 2005). It is our deep belief that the reliability, as well as the use, of this data in developing countries is greatly enhanced if it is carefully collected by scholars in their own countries, who are then linked together in a network and use a common set of research instruments. In the last several years, we have been able to use agent-based models to pursue some of our key theoretical work about settings that are too complex to use formal analytical tools (Janssen and Ostrom forthcoming A; forthcoming B).

I hope this long story illustrates the feasibility, better yet, the overall strength, of using multiple methods to attack two tough analytical puzzles. First, we need to understand the conditions that facilitate resource users to overcome collective-action problems. Equally important is understanding why efforts fail. This has been a story of hard work and scholars from diverse backgrounds willing to work together. We have not found diverse methods to be threatening. We have, I think, used the opportunity to build a stronger research program because of our multiple methods approach. We have found in our research many heterogeneous groups who have devised rules that enable them to cope successfully with the problems they face (see Varughese and Ostrom 2001). Perhaps we political scientists can learn from resource users around the world how to overcome our own heterogeneities so as to achieve a better understanding of the world around us. As the chair of the Political Economy Section, I was delighted that our spring-summer newsletter had two excellent papers. One stressed the importance of case studies for unraveling complex theoretical puzzles (Alston 2005). The second stressed the importance of rigorous quantitative analysis when one is working on a puzzle where sufficient evidence is available (Granato 2005). It is great to see both approaches made so ably and side-by-side.

Universal Laws or Basic Elements of Analysis (Building Blocks)

A major dividing line among members of our discipline when I first started to

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teach was whether our "charge" as members of a scientific discipline was to produce universal laws of political process and outcomes that hold anywhere and at any time (similar to the laws of physics). Those schooled in the tradition of Carl Hempel (1965) and Ernst Nagel (1961) sought only nomological, universal findings as the object of study and strongly criticized most of the earlier work of political scientists as not fitting that criteria. This view of the enterprise underlay the takeoff of the "behavioral tradition" in political science (Dahl 1961). This strong commitment to using quantitative analysis to test propositions was criticized by Gabriel Almond and Stephen Genco (1977) as a mistaken effort to apply hard scientific strategies so that basic research in the social sciences did not differ too widely from that in the natural sciences.

Some social scientists still dream of developing universal laws. Some call their results general laws, as for example, "the general law of supply and demand." The predictions made by these "laws," however, hold only when a large number of conditions are present. Efficient market clearance, for example, occurs only when there are clearly developed legal systems defining property rights, regularized markets where exchange can occur, extensive information systems about the attributes of relevant goods, well-functioning courts established to clarify contractual obligations, an honest set of police to enforce these laws, goods that have few externalities and are undifferentiated on all relevant respects, and citizen demands that are focused entirely on the quantity and price of these goods—to name some of the most relevant conditions necessary for the "law of supply and demand" to operate as predicted.

Those of us schooled in the tradition of John R. Commons (1968), John Searle (1969; 2002), and Vincent Ostrom (1980; 1997) recognize that the social world differs significantly from the biophysical world. As Searle (2002, 17) captures the difference: "Absolutely essential, then, to understanding the nature of the natural sciences is the distinction between those features of reality that are intrinsic and those that are observer-relative. Gravitational attraction is intrinsic. Being a five dollar bill is observer-relative."

In an earlier discussion of observer-relative facts, Searle (1995, 1–2) reflects that:

> there are portions of the real world, objective facts in the world, that are only facts by human agreement. In a sense there are things that exist only because we believe them to exist. I am thinking of things like money, property, governments and marriage. Yet many facts regarding these things are 'objective' facts in the sense that they are not a matter for your or my preferences, evaluations, or moral attitudes. I am thinking of such facts as that I am a citizen of the United States, that the piece of paper in my pocket is a five dollar bill, that my younger sister got married on December 14, that I own a piece of property in Berkeley, and that the New York Giants won the 1991 superbowl. These contrast with such facts as that Mount Everest has snow and ice near the summit or that hydrogen atoms have one electron, which are facts totally independent of any human opinions.

The biophysical world, or brute reality, exists whether or not humans think about it or relate to it. The social world simply does not exist without humans using language to constitute it and relate to each other and to relevant physical objects. The buildings or monuments of an ancient civilization can remain as mysterious physical objects for centuries. It is relatively easy, given advanced scientific measurement techniques, to determine the physical composition and age of these physical remains. To decipher the meaning of these physical objects, however, takes archaeologists extensive work trying to unravel the purpose of structural remains and to decipher linguistic clues.[4] Without knowledge of a relevant symbolic system, however, the best one can do is to speculate on the hypothetical use of a physical object (e.g., this must have been used as a tool or for shelter).

Some social scientists are greatly impatient with the work of others who identify a large number of conditions surrounding their explanation for some process or event or point to some small "unimportant" variable as causing a particular outcome. In the main, I do not view our primary enterprise as one of explaining individual events. Rather, given the number of conditions that affect most political choices, our normal task is to understand structures and resulting processes and how specific combinations of elements affect the likely outcomes of these processes.[5] There are times, however, when the outcome of a particular process is unexpected, important, or has serious consequences that we must dig deeply into the full set of conditions that led to the particular outcome. When this occurs, our task is similar to that of engineers who are asked to determine the cause of a failure of some complex equipment such as an airplane, ferry boat, or rocket. No one criticizes them for identifying some very small part of a large and complex structure as having caused the unexpected.[6]

Similarly, when we explain why a street demonstration erupts into violence or eventually into a rebellion, it may turn a small factor that triggered a frequency-dependent process to flip from peaceful to violent means (see Kuran 1989; Schelling 1978). Ecologists have long studied complex systems and examined the types of disturbances that may cause a flip of a system from one fundamental pattern to another (Berkes, Colding, and Folke 2003; Gunderson and Holling 2001). We are faced with the necessity of understanding how the configuration of multiple variables affects outcomes and to recognize that the variables that caused a flip in one dynamic process may not change the outcome in other broadly similar processes characterized by slightly different combinations of variables.

Then, how do we understand institutional structures and resulting processes? Drawing on an immense literature on institutional analysis from multiple approaches including historical, sociological, and rational-choice institutionalism,[7] we can now begin to identify some of the basic elements needed to conduct theoretical and empirical analysis. By "element," I mean a part used in the analysis of the processes and outcomes obtained in *any* decision structure including: a legislative committee or a full legislature, court proceedings, clean-up activities undertaken by local communities, market exchanges, or principal-agent relationships within a private firm or government agency. This is a bold assertion. I do mean *any* decision structure that humans have self-consciously designed or evolved over time.

One of the challenges that we face is that the number of elements involved in even the simplest structure is quite large. Further, most elements can themselves be broken down into sub-parts and then further broken down into sub-, sub-parts of nearly decomposable systems. Simon (2000, 753) describes the characteristics of nearly decomposable systems: "They are arranged in levels, the elements at each level being subdivisions of the elements at the level above" (see also Simon 1995). Koestler (1973), in discussing biological systems, uses the term "holon" to refer to these part-whole elements.

Instead of resisting this effort to identify elements, their sub-parts, and how they go together as being too complex, we should recognize that the physical sciences started with an identification of four basic elements: fire, earth, water, and air. Modern chemistry has come some distance in positing somewhat over

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100 basic elements. In this overview, I cannot list all of the basic elements of political structures. Instead, I will provide a brief overview of the Institutional Analysis and Development (IAD) framework that scores of colleagues at the Workshop in Political Theory and Policy Analysis have developed over the years (Kiser and Ostrom 1982; E. Ostrom, Gardner, and Walker 1994; V. and E. Ostrom 1997). It is a framework for analyzing nearly decomposable systems ranging from families, to neighborhoods, to large communities, to governmental units at a local, regional, national, or international level (see E. Ostrom 2005; Gibson et al. 2005).

The focal level of analysis that we start with in using the IAD framework is that of an action arena. An action arena is composed of *participants* in *positions* choosing among *actions* at particular stages of a decision process in light of their *control* over a choice node, the *information* they have, the *outcomes* that are likely, and the *benefits and costs* they perceive for these outcomes. These seven basic elements (italicized above) can be used to build an immense array of superficially different structures. For complex structures, it is, of course, necessary to break down the structure further into components and subcomponents rather than building the entire structure from basic elements.

Obviously, one of the key working parts of this focal level of analysis is the participant. Since the IAD is a framework for doing theory rather than a theory itself, scholars may use and compare any of a diversity of theories of human behavior (including critical theory [Schiemann 2000], evolutionary psychology [Cosmides and Tooby 1994], heuristic choice [Gigerenzer and Todd 1999], or bounded rationality [Jones 2001]) to animate the structure being studied. It is also possible to compare outcomes predicted by diverse models of the same broad theory rather than being committed to using one and only one model of a theory (see, e.g., Cox and Sadiraj 2004; Ahn, Ostrom, and Walker 2003).

Underlying the focal arena are variables that are treated as temporarily exogenous while focusing on a particular focal level of analysis: the underlying biophysical world, the rules used to structure the arena, and the broader community in which the arena is located. For political scientists, the rules creating the arena (or game form) under study are themselves of substantial interest.

After many years of studying the rules in use in a wide diversity of arenas, we have developed a classification system that focuses on the rules that directly affect each of the seven working parts of all arenas, enabling one to begin to capture the broadest grouping of rules needed for consistent study of the impact of diverse rules on behavior and outcomes. This leads to a classification of seven broad types of rules: position, boundary, choice, aggregation, information, payoff, and scope. Crawford and Ostrom (2005, 190) explicate the relationship between the broad classification of rules and the earlier-mentioned working parts of all arenas.

> Position rules create positions (e.g., member of a legislature or a committee, voter, etc.). Boundary rules affect how individuals are assigned to or leave positions and how one situation is linked to other situations. Choice rules affect the assignment of particular action sets to positions. Aggregation rules affect the level of control that individual participants exercise at a linkage within or across situations. Information rules affect the level of information available in a situation about actions and the link between actions and outcome linkages. Payoff rules affect the benefits and costs assigned to outcomes given the actions chosen. Scope rules affect which outcomes must, must not, or may be affected within a domain.[8]

The specification of seven broad types of rules does not imply that there is a one-to-one relationship between any particular action and a specific rule. Anthony Giddens (1979) long ago pointed to the fallacy of statements like "the rule governing the Queen's move in chess" since what moves a Queen can take in chess depend on multiple rules that constitute the game of chess and where in the stages of a game a participant is contemplating diverse moves.

Each of the seven broad types of rules can be unpacked into sub-categories and then further unpacked into sub-, subcategories just as the seven working parts of a focal arena can be unpacked multiple times to address relevant research questions that require deeper categories than the higher levels. To add further to the challenge of analyzing complex, nested arenas, underlying any particular set of rules are deeper policy arenas where changes in the focal rules may occur, and even deeper constitutional arenas where changes in the rules of the policy arenas are themselves debated and crafted.

Many important analyses in political science have focused on procedural rules related to agenda setting or final approval in electoral settings. Since many other aspects of these electoral settings are held constant, the sometime relatively large and sometimes surprising differences in outcomes result from small changes in what might be considered "dull" procedural rules. Alt and Shepsle (1998) compare three very simple voting arenas where an odd number of voters are posited to have single-peaked preferences over potential outcomes as well as complete and common knowledge and no time limits. In the first two cases, the final aggregation rule is simple majority rule. The first case is the well-known, median-voter model of Duncan Black (1948) who posited rules related to agenda setting that allow anyone to make a proposal pitted against the status quo, any proposal winning becomes the new status quo, and the decision is reached when no further proposals are made. The final outcome is posited to be the one preferred by the median voter.

In the second model, Romer and Rosenthal (described in Rosenthal 1990) change only two rules—creating a new position and giving the holder of that position the sole authority to propose changes to the status quo. All of the other assumptions used in the original Black model are held constant. With this change, they find several logically possible outcomes instead of only one. Changing only these two rules and keeping *all* the other rules and attributes of an arena the same, however, makes it very rare for the final outcome to be that most preferred by the median voter. In the third model, Shepsle and Weingast (1987) drop the agenda-setter rules but add a new position with the authority to veto any decision after it is reached by a majority rule. This change generates a result that the final outcome is the one preferred by the veto player.[9]

What is useful about theoretical exercises such as these is that one can demonstrate the changes in posited outcomes that are likely to result from changes in particular choice rules added to a simple majority voting rule. David Mayhew (2003) provides an excellent illustration of the empirical importance of these rules (regarding who picks the agenda or must agree to the finality of a majority vote) in regard to the U.S. Senate. There, the aggregation rule is a simple majority, but it is compounded by a cloture rule requiring agreement by any 60 senators to end debate and accept the last version of a bill that had been agreed upon by a majority of the senators.[10]

By being consistent in building a theoretical model that holds the assumptions made about participants constant and changing a limited set of rules at a time or vice versa, one can examine the likely consequences for situations that closely

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approximate the ones in the theoretical models. When one asserts that the outcome of using majority rule is X or Y, one learns from these examples (and many more in the literature) that one needs to specify much more about both the other rules-in-use and about the knowledge, information, preferences, and other important attributes of participants.

Beyond this very brief illustration, the entire framework is obviously too complex to present fully on this occasion. Those of us who have been working with it over a long period of time have more and more confidence in its strength as a core organizing theoretical framework given the wide diversity of research that has successfully been conducted using this framework (for relevant cites, see E. Ostrom 2005, chap. 1). Recognizing the complexity of the building blocks of political structures can help us understand why prediction and explanation are so challenging in our discipline. Our task is to identify the working parts, the grammar, and the alphabet underlying the patterns of human social behavior as well as the underlying structure of rules, of community, and of the biophysical environment and how these combine to generate incentives, actions, and outcomes. To do this well over time, we will all need to pay closer attention to how we define and use key terms. For concepts such as strategies, norms, and rules, we frequently talk as if on a Tower of Babble where few use the same definitions for the terms we all use (see Crawford and Ostrom 2005).

Rational Choice—An Evil Approach or a Theory Undergoing Challenge and Development?

One of the basic disagreements in political science is over the model of the individual that we use or whether we even need to think about individual-level choice behavior (Green and Shapiro 1994). It is obviously impossible for micro-theorists to avoid working with a theory of how individuals make decisions within diverse situations. A self-conscious awareness of the theory that one uses to generate explanations or predictions is far better than keeping assumptions about the processes of individual choice hidden from one's own and others' views. Rational choice theory, as developed in neoclassical economics and game theory, is a powerful and useful tool of analysis.[11] Many of us appreciate the clarity and precision that one can bring to the analysis of complex, competitive situations using this tool. Modeling processes is one important method for checking out that one's intuitive vision of why outcomes are generated is logically sound. Like all tools, however, one needs to learn for what problems it is useful and where it leads to erroneous predictions.

The battle within political science has, however, not really focused on when and where this theoretical tool helps to better understand behavior. Rather, far too much energy has been devoted to criticizing or defending the use of the neoclassical version of rational choice as the *only* way to explain individual choice. If it were our only way to view political behavior, we could not explain why some people vote, engage in voluntary charities, or invest time and effort to create rules and enforce them related to the sustained use of common-pool resources.

Mancur Olson (1965) did political science a gigantic service by challenging the naïve theory of latent groups or quasi groups held by theorists such as David Truman (1951) and Ralf Dahrendorf (1959). Assuming that individuals will routinely devote time and energy to the pursuit of group benefits whenever common interests are perceived as important is a comforting but not very useful foundation for the study of democratic systems. Using this assumption, how institutions may or may not enhance the level of assurance and feedback that individuals obtain about the likely and continued contribution of others is not even considered relevant. And yet, the ways that individuals gain a reputation as being trustworthy have repeatedly been shown to be essential in many settings.[12]

On the other hand, the prediction of zero cooperation in Olson's theory of collective *in*action has been shown to be only one outcome out of many in indefinitely repeated settings (Kreps et al. 1982), and is not empirically supported in many empirical settings (Dawes et al. 1986; Frohlich, Oppenheimer, and Young 1971; E. Ostrom 1990; 1998; and many others). This unlikely theoretical prediction, nevertheless, has stimulated an immense body of empirical research and thus has been a great contribution to the development of all of the social sciences. We can appreciate the stubbornness of scholars who do not give up a theory or method easily just because it does not do everything.

Considerable differences exist among scholars who rely on a self-conscious theory of individual choice when explaining or predicting behavior. Many political scientists lump all scholars who use a thin model of human rationality together with those who are developing second- and third-generation behavioral theories (Camerer 2003; Cox 2004; Frohlich, Oppenheimer, and Kurki 2004; Orbell et al. 2004; E. Ostrom 1998; Scharpf 1997) as well as important dynamic theories of belief formation and investment (North 2005). One does not just toss out a theory that has proven valuable in many settings because it does not work well in others. Many efforts to broaden the theory are well underway, and it will continue to be usefully employed to address many interesting questions in competitive situations. Some of the factionalism does stem from the arrogance of those who consider the continued use of a narrow model of human rationality the essential qualification for doing good social science.[13]

Context does matter! Alchian (1950) long ago argued that the neoclassical model of rational choice is an effective tool for predicting behavior in an open, highly competitive market setting. Satz and Ferejohn (1994) have also shown its usefulness in other types of highly competitive settings. We should not toss away useful tools in the social sciences. We need any and all tools that are helpful for explaining and predicting behavior in some settings. Further, we need to develop even further tools to analyze dynamic processes in a changing world (North 2005). We must avoid, however, relying on the strategy heavily used by all scientists that might actually approach being a real "law"—"The Law of the Hammer." Scientists do seem to follow a pattern that when we have found a useful tool, we determinedly use it in any and all environments. To provide sound explanations, we need to pay substantial attention to the structure of a situation and the underlying cultural, institutional, and biophysical context. Then, in light of understanding this context, we can choose the model of individual behavior most relevant to predicting outcomes in this type of situation (see Pasotti and Rothstein 2002).[14]

The Silo Organization of Our Ivory Towers in an Ever-More Connected World

The increasing specialization that is occurring in most universities is leading more and more researchers to focus almost entirely on their own specialty and to know little about related work even in their own discipline, let alone to work with colleagues in other disciplines.[15] Further, many scholars do not get out into the communities surrounding their universities or participate in ongoing collective action in other domains to study real problems on the ground. Instead, they rely on census data or other data

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that are made available to them. There is much to study in the field! Madison's presumption that creating a federal system would stimulate considerable experimentation at state and local levels has certainly been substantiated (McGinnis 1999b). Victor, House, and Joy (2005) point to the success of "A Madisonian Approach to Climate Policy" in which innovative policies are being tried out within nations, regions, and even by individual firms.

As a scholar who co-directs two interdisciplinary centers—the Workshop in Political Theory and Policy Analysis (the Workshop) and the Center for the Study of Institutions, Population, and Environmental Change (CIPEC)—I am frequently asked how we overcome the extremely high walls that have been built around contiguous disciplines to study complex phenomena that requires a multidisciplinary approach. My answer focuses on the questions we address.

A core interest of colleagues associated with the Workshop is the question of how individuals can build and sustain workable democratic systems and sustainable resources at local, regional, national, and international levels in all parts of the world.[16] Colleagues in political science have frequently chided us for the many studies we have conducted on "dull, unimportant local problems." If one confines political science to the study of national elections, national legislative behavior, and the politics of the presidency, we are missing a great deal at both a local and international level.[17] We must draw on all of the social sciences as well as ecology, biology, history, cultural studies, area studies, and law to slowly build a better, multidisciplinary base for our work on all levels of political organization.[18]

A core question for colleagues associated with CIPEC is what are the major causes of environmental change at local, regional, national, and international levels? One must draw on the environmental sciences and on methods like Geographic Information Systems, the interpretation of remotely sensed data, as well as gathering field data about ecological processes as well as human processes affected by and affecting the ecological world (Moran and Ostrom 2005). Scholars involved in genuinely interdisciplinary research have to learn something about the other disciplines necessary to address a common puzzle while not pretending to become a specialist in any but their own foci.[19]

Unfortunately, promotion, tenure, and hiring committees are frequently composed of colleagues specializing in one discipline who evaluate the work of others by the number of publications in their own discipline and totally discount publications in interdisciplinary journals. The fractionalization within our own discipline makes it even more difficult for young political scientists who participate in interdisciplinary teams to be considered for tenured positions at major universities. Fortunately, some innovative major universities are developing rigorous programs that examine major policy questions from an interdisciplinary perspective—a growing need in the contemporary world.[20]

Facilitating research teams composed of faculty from diverse disciplines, as well as students, is one way of breaking down unnecessary barriers within universities as well as the barriers between universities and the public. We learn a lot from studying how people solve or fail to solve core problems that are repeatedly found in many diverse settings. Studying how citizens from very diverse backgrounds coped with the creation of multiple institutions at many scales to solve (in some cases, and not in others) complex groundwater basin problems gave both Bill Blomquist and I a substantial appreciation for the entrepreneurship citizens can show when they are in an open society with authority to create private and public instrumentalities (see Blomquist 1992; E. Ostrom 1990). And, along the way, we had to learn a little about geology and engineering!

One gains substantial insight into the importance of obtaining accurate information about the structure of the problems being faced and being able to challenge the validity of that information. In the cases we studied, the groundwater users threatened by overuse were able to use equity jurisprudence and ask a court to assign a fact-finding watermaster to make a report as a disinterested party on the conditions of the groundwater basins. Many ways exist for problem-solving individuals to approach this challenge—equity jurisprudence is only one way.

The key variables, however, are (1) an open system, (2) the availability of impartial information organized at the right scale for the problem being addressed, (3) the capacity to challenge information as well as the implications that stem from diverse interpretations of the problem and potential solutions, and (4) the creation of fora at appropriate scales where potential solutions can be posed, argued about, and eventually adopted with mechanisms that assure conformance with agreements and sanctioning of non-conformers. These elements are important for *any* system facing threats if the threats are to be turned into opportunities for future improvements and developments. Many of the new committees established to discuss governance within the APSA, our journals, our undergraduate and graduate-level curricula, and our hiring and tenure practices may enable us to grow stronger because we have recognized some threats, obtained more accurate information about them, and debated openly about how to interpret this information and about which solutions may be feasible.[21]

If we continue along these lines of development, the opportunities for the future are substantial. If we regress into ever greater factionalism, we risk becoming irrelevant in a world that has become ever more complex, multi-leveled, and in need of skilled political scientists working with scholars and practitioners from other disciplines to put forward their best ideas derived from multiple approaches for citizens to consider in democratic fora. Let us meet this challenge, even welcome it as an opportunity.

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Let us learn from Madison about the dangers of faction for any group that has multiple views of the best way forward. We are much stronger if we learn to respect the multiple approaches proposed, both for how we do our science as well as how diverse policies can lead to better outcomes when learning and adaptation are enhanced. As a discipline, we can move forward when we embrace learning from multiple approaches. As citizens of the world, we must learn there are no blueprints that fit all the puzzling policy questions we face. We improve our chances for survival if we encourage a Madisonian approach to local, national, regional, and global problems.

Notes

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always, I deeply appreciate Patty Lezotte's careful editing.

1. We will draw on several published articles as well as work in progress (see Poteete and Ostrom 2004A; 2004B; Janssen and Ostrom forthcoming A; forthcoming B; E. Ostrom forthcoming).

2. See the special issue of *Science* (December 2003), which focuses on the 35th anniversary of the publication of Hardin's first article in *Science*.

3. On average, subjects approached the predicted Nash equilibrium after only a few rounds of the experiment when they were not allowed to communicate.

4. And, in line with my general argument that multiple methods are essential to gain full understanding, modeling alternative explanations is also very helpful (see Janssen and Scheffer 2004).

5. There is no single cause for human behavior. To live, we need oxygen, water, and nutrition, and all are key parts of the explanation of life. Life itself operates at multiple levels. Genes underlie phenotype. Selection processes operating primarily at an individual level, but also in a multilevel process, select for some genes and against others. Complementing the biological are many developmental and social factors (see Alford and Hibbing 2004). At any one point in time, one or two variables may become the limiting condition in the sense that John R. Commons discussed it. At that point, that particular variable is crucial, but it is still not the *only* cause of the complex patterns observed.

6. While writing this paper during the summer of 2005 at our log cabin in the Canadian wilds of the Manitoulin Island, we listened to the CBC news of a major ferry boat accident in Vancouver Harbor that was eventually attributed, after a week-long investigation, to a small part in a clutch that had broken.

7. See Alt and Shepsle 1998; Alt, Levi, and Ostrom 1999; Boyd and Richerson 1985; Farr, Dryzek, and Leonard 1995; Hall and Taylor 1996; Hodgson 2004; March and Olsen 1989; North 1990; 2005; Ruttan 2003.

8. This classification of rules is broadly similar to the five "dimensions" of rules that Koremenos, Lipson, and Snidal (2001, 763) propose as basic tools used in the design of institutions.

9. See also Tsebelis (2002) and Herzberg and Ostrom (1991) for further explorations of the role of veto players in a wide diversity of arenas.

10. Ken Shepsle (2003, 28) recently reflected on the beauty and fun of scholars using multiple methods who respect each other's work in acknowledging "the unparalleled cross-fertilization among soakers and pokers, history jocks, quants, and rat choicers. The congressional scholarship field has always been a methodological rainbow." It is my hope that we can all search out ways to produce "rainbows" rather than "thunderstorms."

11. It is important to recognize that one can use game theory without working at the individual level as well as without the need to assume a single preference function. Game theory has been extraordinarily useful in helping political scientists understand two-level games and some of the limitations of international negotiations (McGinnis and Williams 2001; Putnam 1988) as well as how conflicts can tragically move from one bad equilibrium to another (McGinnis 2005).

12. Such as in the early development of international trade (Greif, Milgrom, and Weingast 1994; Milgrom, North, and Weingast 1990), signaling systems such as ethnicity that enhance trust (Landa 1994; Janssen 2005), and signaling systems that evolved in pre-colonial Africa to surmount reliance on strict ethnicity to achieve productive trade (Leeson 2005).

13. The extreme devotion to exclusive use of the thin model of rational choice continues in spite of strong advice to the contrary by at least four Nobel Prize winners in Economics: Reinhard Selten, Douglass C. North, Herbert Simon, and Vernon Smith (see Selten 1990; Gigerenzer and Selten 2001; North 2005; Simon 1999; 2000; Smith 2000).

14. When we are interested in studying how individuals interact in settings that are relatively new to all or most of them, we must rely heavily on any of several learning models of human behavior (see Busemeyer and Myung 1992), but when we are studying patterns of interaction among participants who have a long history of interacting in a particular setting, how they learn about the values of the relevant variables is no longer as important to analysis.

15. Richerson and Boyd (2005, 245) contrast how biology is taught to freshman students—covering an immense set of subdisciplines—as contrasted to the social sciences that narrowly focus on a subdiscipline even in the freshman year.

16. See V. Ostrom 1997; Sawyer 2005; Gellar 2005; Allen 2005; Agrawal 2005; Shivakumar 2005; Gibson et al. 2005; McGinnis 2005.

17. It is now common for textbooks in political science to focus almost entirely on national and international affairs. In Ginsberg, Lowi, and Weir's (2003) introductory textbook, *We the People*, not even a chapter is devoted to state or local governance. A real challenge for the continuance of an informed citizenry in the U.S. is the disappearance of state and local governance from all but a few upper-division courses taught in most political science departments.

18. For an overview of the research program of the Workshop, see the special issue of the *Journal of Economic Behavior and Organization* (vol. 57, no. 2, June 2005) edited by Peter J. Boettke on *Polycentric Political Economy: Essays in Honor of Elinor and Vincent Ostrom*, and McGinnis (1999A; 1999B; 2000).

19. In other words, to work on a land-use problem involving the use of GIS and remotely sensed data, all members of a team must learn the elementary "basics" of this technology. Without experts, however, on the team, bad errors can be made in the execution of key steps in analysis and the interpretation of findings. This mixture of modestly educated and real experts is essential to the success of interdisciplinary teams.

20. See especially the new school of Human Evolution and Social Change at Arizona State University; the Donald Bren School of Environmental Science and Management at the University of California, Santa Barbara; the George Perkins Marsh Institute at Clark University in Worchester, Massachusetts; and the School of Social Ecology at the University of California, Irvine.

21. The new section organization of the APSA is also a very good structure to enable folks from diverse traditions interested in some intersecting foci to meet, prepare newsletters, and discuss methods, so long as it too does not encourage factionalism.

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