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REFLECTIONS ON THE ELEMENTS OF INSTITUTIONAL ANALYSIS

by

Larry L. Kiser and Elinor Ostrom

Kiser is in the Economics Department, Eastern Washington University, Cheney, Washington, and a Research Associate (1978-88) in the Department of Public Administration, Erasmus University Rotterdam.

Ostrom is in the Political Science Department and Co-Director of the Workshop in Political Theory and Policy Analysis, Indiana University, Bloomington, Indiana.

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Indiana University 513 North Park
Bloomington, Indiana 47405

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The general framework developed in "The Three Worlds of Action: A Metatheoretical Synthesis of Institutional Approaches" (Kiser and E. Ostrom, 1982) was an attempt to integrate work by economists, political scientists, anthropologists, lawyers, and others studying the effects of institutions on behavior. During the five years since that effort, we and some of our students have refined several aspects of the framework and have applied it to several problems in institutional analysis. We have also applied the framework to a series of empirical studies and have examined its relationship to theories in public choice and new institutional economics. Now, in light of this additional work, we want to revisit the framework.

The original article developed two separate but related theses. One thesis distinguished among three kinds of decision making (constitutional, collective, and operational choice) and developed relationships among them. The other thesis specified several elements useful for analysis within each kind of decision making. The current paper focuses exclusively on the second thesis and develops each element of the framework, incorporating our thoughts from the past five years.

Behavioral Analysis Focuses on Action Arenas

Analysts studying institutional effects on behavior usually concentrate their analysis on an action arena, composed of a "model of the individuals" who participate in an "action situation." Analysts describe

the structure of an action situation by referring to any of seven elements (or variable clusters) including: (1) participants, (2) positions, (3) actions, (4) outcomes, (5) linkages between actions and outcomes, (6) information, and (7) payments or payoffs assigned to the actions and outcomes. Analysts may also refer to structural dimensions such as frequency or complexity of the situation or the degree of control that participants exercise in the situation. When modeling individuals, analysts may refer to any of four variable clusters including: (1) resources that individuals bring to the situation; (2) individuals' valuations of possible actions and outcomes in the situation; (3) individuals' procedures for acquiring, processing, retaining, and using information; and (4) individuals' strategies for selecting particular courses of action.

By combining a picture of the situation with a model of the individual, analysts predict actions that participants will take in the situation. Then, by aggregating the predicted actions according to patterns established in the structure of the situation, analysts predict final outcomes. Analysis, often expressed as though individual people are making choices and taking action, also applies to aggregated groupings, such as economic firms and public agencies, or groups of organizations, such as implementation structures. Aggregated levels of analysis sometimes presume a fiction that organizations function as fully integrated decision makers. Thus, analysts can apply similar approaches for analyzing behavior and outcomes to:

- individual buyers and sellers exchanging goods;
- a coordinating committee of department heads reacting to a policy;
- legislators reviewing a proposed bill within a committee;

- bureau chiefs and officials bargaining over the bureau's budget allocation and output;
- superiors and subordinates in a bureaucracy bargaining over work assignments and rewards;
- public and private agencies exchanging services in the context of public service industries;
- neighbors constructing a playground on a vacant lot; and
- citizens voting in an election.

When explaining strategies and cumulated results within an action arena analysts accept the structure of the situation and attributes of individual decision makers as given. In the short run, participants do not change the structure of the situation. They act within the opportunities and constraints of the situation according to their own resources and values. The analyst identifies the proximate causes of results in the structure of the situation itself.

In the long run, however, the structure of the situation, can change (either as a result of external forces or internally as a result of the efforts of the participants to change the situation). To investigate long run considerations analysts shift from the action arena itself to those factors which are constitutive of the action arena. The factors that put the action situation together include institutional arrangements or rules, physical and technological conditions, and attributes of a community. These factors can be thought of as more distal causes of the results obtain in any situation.

The structure of an action situation is what can be observed on the surface. The proximate structural elements, such as the number of participants engaging in an activity, individuals' actions, outcomes, and the payments and payoffs are readily observed. Often we do not immediately

observe the underlying factors -- the rules, physical and technological conditions, and community values and understanding -- lying beneath the surface. The difference between surface variables and underlying factors is especially important in conducting institutional analysis and design. Attention necessarily focuses on elements beneath the surface which are more difficult to observe and measure. People cannot create a market, for example, as they might construct a road, merely by assembling and affecting an appropriate mixture of visible physical components. Assembling a number of people possessing various commodities in a marketplace and telling them to buy and sell with each other does not create a market. A market implies a welter of rights and duties to individual participants and, thus, requires a set of rules to be known and understood by most of the participants. The rules create capabilities for and constraints on people who might want to negotiate exchanges with one another.

The type of market that evolves from a set of rules also depends on cultural and physical factors. Ethnic divisions in some countries, for example, reduce market competition. Firms hire only from a particular group regardless of inexpensive labor available elsewhere. On the other hand, ethnic identification may substitute for the presence of generally available and enforced rights of contract. Individuals may be willing to engage in long-term contractual relationships with members of their own ethnic community where they are fearful of engaging in such long-term contracts with others where no assurances can be made that contracts will be enforced. Physical factors, such as the appearance of indivisible commodities and economies of scale also affect the type of exchange arrangements which are feasible in an action arena.

Analysts specializing in an academic discipline may pay attention to only one of the factors affecting the structure of action arenas. Sociologists concentrate on community value systems and the effect on people's relationships with one another. Environmentalists concentrate on physical and biological conditions and the effect on opportunities and constraints in people's situations. Legal scholars concentrate on rule systems and the effect on incentives and disincentives for particular kinds of interaction among people. Rule systems, physical conditions, and community value systems, however, all jointly affect the types of actions that people take and the outcomes they achieve. Rule systems effective in one physical setting, where all goods are perfectly divisible and separately consumed, are frequently ineffective in another physical setting, where goods are indivisible and consumed jointly.

Analysts who specialize and focus on parts of this analysis have made significant advances in understanding human interaction. But, to learn from insights in other areas of study and to avoid thinking that a particular focus is the best way, or the only way, to study human interaction, analysts need eventually to connect the pieces. We present this framework to help in that effort. We particularly want to encourage analysts interested in institutions to consider the contextual effects of which institutions are a part.

Modeling the Action Situation

All analysts studying human interaction rely on an explicit or implicit model of the action situation they examine. Economists model market situations where buyers and sellers make exchanges. Political

scientists model situations where legislators form coalitions or engage in logrolling. Sociologists model group situations where people exchange support and acceptance with one another. Analysts in public administration model bureaucratic situations where supervisors and subordinates negotiate over performance expectations and evaluations. Analysts can break all such situations into seven fundamental elements or group of variables including: (1) the variety of positions that participants in the situation can occupy, (2) the number of participants in each position, (3) the array of potential actions achievable, (4) the array of potential outcomes open to each position, (5) linkages between the potential actions and outcomes, (6) channels for communication among participants, and (7) payments or payoffs assigned to actions and outcomes.

An economist analyzing a competitive market situation, for example, would identify two positions, one representing the seller and one representing the buyer. Competition implies a large unspecified number of participants in each position, preventing any participant from individually influencing the parameters of exchange. The selling situation, as a result, looks the same to all sellers, with all restricted to the alternative actions of offering various quantities of a product for sale at the market price. The buying situation looks the same to all buyers, with all restricted to the alternative actions of buying various quantities of the product at the market price. Buyers and sellers can expect various outcomes of exchanging money for quantities of the product, with revenue payoffs to sellers and product and utility payoffs to buyers. The primary challenge to the economist is to develop linkages between particular quantities of sales and profit levels to sellers and between particular quantities of purchase and levels of satisfaction to buyers and ultimately to predict an equilibrium result.

Many familiar concepts, such as certainty, risk uncertainty, control and power, can be defined in terms related to one or several of the elements of a situation. The concepts of certainty, risk, and uncertainty, for example, relate directly to the linkage structure between actions and outcomes. If each action available to a participant in a position is linked to one and only one outcome, the linkage can be characterized as certain. If actions are linked to multiple outcomes, the linkage is either risky or uncertain. When the probability of an action production a particular outcome can be known (whether or not a particular individual knows them) the linkage would be characterized as risky. When the probabilities cannot be known, the linkage would be characterized as uncertain (see Knight, 1921)

Similarly, an analyst can use the concepts of control, opportunity, and power to describe the linkage between actions and outcomes related to a position. A participant in a position has total control over an outcome in a situation, if for each value that the outcome can potentially take, the individual can take an action such that the conditional probability of a particular outcome, given a particular action, equals one (Coleman, 1973: 61). A participant has partial control over an outcome, if the conditional probability of achieving a particular outcome, given a particular action, is greater than zero and less than one. Partial control varies from an extremely small chance of affecting an outcome to a high probability of affecting the outcome. A participant can be said to be impotent with respect to an outcome when he or she has no control over the values of an outcome (see von Wright, 1966: 129-131, for a discussion of control which is similar to that of Coleman).

The opportunity available to a participant is the range of outcomes that the participant may potentially affect (Commons, 1959: 21-28). The "power" of an individual can then be defined as the value of the opportunity times the extent of control. Thus, an individual can have a small degree of power, even though the individual has absolute control over some outcomes, if the amount of opportunity is small. The amount of power may also be small when the opportunity is large, but the individual has only a small degree of control.

The seven elements of a situation can be thought of as a set of building blocks out of which an action situation is created. In any social system to be analyzed, there are always participants in positions taking actions from an array of available options which are linked in various ways to outcomes. The choice of actions depends on the information that participants have about the structure of the situations and the rewards or punishments assigned to combinations of actions and outcomes. Simply listing the elements of a particular situation, however, does not fully describe the structure of a situation as it is the particular configuration of elements -- that also must be taken into account. Some characteristics of a situation are characteristics of a particular part or several parts of a situation, such as risk, control and power. Some characteristics of a situation are not derivable from a single element of a situation or even partial combinations of these elements. Thus, in addition to the elements or components of a situation, an analyst needs to examine properties of a situation which emerge at the level of the situation itself (see Mayr, 1982, for a discussion of emergent properties).

Configuration of Elements and Emergent Properties

An example of an emergent property is complexity. Complexity does not reside in any single element of an action situation such as the number of participants. Many situations involving large number of participants (for example, a competitive market) are less complex for participants and for analysts than some situations involving small numbers of participants (for example, a cartel on the brink of dissolution).

In our earlier work, we did yet understand the concept of emergent properties of situations as a whole and at times we confused the elements of a situation with emergent properties.[1] Yet people using everyday language are more apt to talk about the emergent properties of a situation than its elements. They talk, for example, about the frequency of a situation ("We've done this many times before") or the complexity of a situation ("This is really confusing"). Further, scholars such as Oliver Williamson (1985) have pointed to key attributes of situations that are not the elements we have described above, but which affect behavior and outcomes in predictable fashion.

Williamson has referred to several variables as "dimensions of a transaction" which can be translated as emergent properties of a situation. Williamson identifies repetition as a key dimension and shows how it causes competitive market situations to undergo a fundamental transformation not usually recognized in conventional economic analysis. Transactions, he writes, can start in a competitive environment. Contrary to conventional analysis, competitive situations can be quickly transformed into a monopolistic situation. Initially, many parties compete with one another to conduct an exchange, but the winners soon separate themselves from the competition. They make investments specific to the transactions and

become, therefore, more or less tied to continuing the transactions with each other. Were they to shift their business to others, they would sacrifice the use of the specialized investments. Williamson concludes that participants in such repetitious situations usually try to change the underlying factor of institutional rules to bind the parties together more tightly than the arm's-length relationships produced by the rules of a competitive market.

Repetition combined with specialized investment alters the elements of the situation as outlined in Figure 1. The figure shows that four of the seven elements of the situation change after an initial transaction. Two new positions develop in subsequent situations. The past buyer and seller do not confront quite the same situation as other potential buyers and sellers. The number of participants, as far as the past buyer and seller are concerned, reduces from a large number to only two. Many other continue to participate in the potential buyer and seller positions, but only one participant is in the past buyer and seller positions. This transforms the situation into a bilateral monopoly. Parties in the potential buyer and seller positions, meanwhile, skulk about the perimeters, awaiting a breakdown in the continuing transactions. Williamson notes that flows of information within the situation also change, as transacting parties develop a specialized language and subtle signals for dealing with one another.

[Figure 1 About Here]

As elements of the situation change, so do some of the dimensions. Rather than the high degree of flexibility that existed in the initial situation, where participants can choose from a large pool of competitors, subsequent situations grow less flexible. Participants can still bargain

toward mutually agreeable terms, but neither the buyer nor seller is quite as free as before to turn to competitors for a better deal. The party that makes the highly specific investments, according to Williamson, feels vulnerable to possible disruption in the relationship and presses for protective institutional arrangements between the two parties.

Relationships among the participants in a situation are also properties of the whole situation rather than of its parts. The control, opportunity, and power of a single participant can be defined, as above, in terms of the linkage element of a situation. The relative power of one participant vis-a-vis other participants, is however, an attribute or dimension of the symmetry or asymmetry of power relationships among all participants.

Other dimensions important in institutional literature include inexorability, duration, and clarity. In a situation which would be described as inexorable, every participant has a dominant strategy that when combined, lead to a single outcome. Some inexorable situations are considered to be perverse -- such as the tragedy of the commons. Others -- such as the outcomes obtained in a perfectly competitive market -- are tight situations with one result that is beneficial for the participants and others. A situation which is inexorable in the short run may well be changed by the participants themselves or others in the long run. Thus, participants dependant on an overused commons may change the structure of the situation leading to an inexorable tragedy so as to avert the tragedy. Similarly, participants engaged in a competitive market may change the structure of the situation leading to an inexorable benefit for all so as to monopolize the gain for themselves.

The duration dimension measures the time for a series of interactions to come to a conclusion. Institutional rules along with physical and technological conditions can affect the duration of a situation. Service delivery arrangements, for example, can either expand or reduce response time in police services and red tape in bureaucratic procedures. Similarly, rules can clarify or obscure a situation by sharpening or muddying distinctions among positions, clarifying or obscuring rights to take actions and obtain outcomes, and by adopting an efficient or inefficient language and communication system.

Modeling Individuals in the Action Arena

In order to derive inferences about likely actions in a situation and resulting patterns of outcomes, an analyst makes implicit or explicit assumptions about the attributes of individuals making choices. At a minimum, any model of the individual involves implicit assumptions about: resource endowments that individuals bring to the situation, individuals' capabilities for obtaining and processing information, their valuation of potential actions and outcomes in the situation, and their internal calculation processes or strategies for comparing alternatives available in the situation.

At the most general level, an institutional analyst tries to understand the position of each of the participants in a situation and to reason through the objectives that such a participant would pursue, what resources they would bring to the situation, how much knowledge they would have, how they might learn from experience over time, and what type of calculation processes they would adopt. Having done this, the analyst

infers the likely behavior of participants and how they would or would not be led to stable results. The assumptions about the individuals are the components of an analytical engine that activates (i.e., gives motion to or is a moving part of) an action arena enabling institutional analysts to make predictions and explain outcomes.

Neoclassical economics and modern game theory have developed a model known as homo economicus, which assumes that individuals have sufficient resources to engage in the situation under analysis, have perfect information, maximize net benefits, and consider only narrow self-interested values in their decision making. The assumptions have succeeded in generating verifiable and empirically supported predictions in a variety of tightly constrained action arenas. Despite their lack of realism, they are useful for predicting behavior in the simple, repetitious competitive market situations found in economic theory. The situations hardly challenge even limited decision maker capabilities, making it reasonable to assume that within such situations decision makers act as if they possess complete information and are capable of maximizing net benefits.

Scholars inside and outside of economics, however, are currently attacking the homo economicus assumptions of perfect information, maximization behavior, and narrow self interest, as unrealistic and inappropriate for many types of analyses. Analysts studying institutions other than repetitious, competitive markets especially regard the assumptions of homo economicus as inappropriate for analyzing behavior in more complex situations. Instead, institutional analysts tend to assume that individuals interacting in complex situations adapt as they make mistakes and learn about situations and as they are made aware of the

variety of sometimes conflicting objectives they pursue. Such assumptions lead analysts to generate propositions which differ markedly from both neoclassical economic theory and from modern administrative theory which rely on less realistic models of the individual. Presuming that humans make mistakes, for example, leads analysts to stress a need for redundancy in institutional arrangements. And presuming that public officials value objectives in addition to constituent welfare, leads analysts to stress a need for arrangements with countervailing sources of power.

The issue of what assumptions to make about individuals when analyzing diverse situations is far from resolved. We will briefly review the recent work of several major scholars as it pertains to various components of the model of the individual.

Geoffrey Brennan and James Buchanan (1985) recently defended the self-interest assumption in the homo economicus model as uniquely appropriate for comparative institutional analysis. They do not appear to believe that human beings are interested only in themselves, but argue that institutional analysis requires such an assumption. That people often look after their own well being first creates conflict as people interact. Individuals, therefore, develop rules to govern their interactions and to control conflict. That some of the time people also voluntarily cooperate with one another and regard each other's welfare, merely makes the task of developing effective rules easier.

Brennan and Buchanan argue that institutional analysts should assume greater self-interest than actually exists on average. To assume that individuals pursue their own self-interest to a lesser extent reduces the pressure on an institutional analyst to design countervailing power into the rule system, resulting in social loss when self-interest motivations

surface. Brennan and Buchanan claim that the loss from allowing the self-interested to puruse their interests unfettered will exceed any gains from allowing those who are more self-less to act without constraint.

Brennan and Buchanan point out that even moral people can be driven to position their own interests first, when they would like to advance the welfare of others, as well. Competition with people interested only in themselves frightens the more self-less individuals into looking primarily after themselves also. For self-less ambitions to flourish, a high proportion of a population must adopt that attitude before people feel secure enough to act in the interest of others. Brennan and Buchanan, by the way, do not believe that people who have achieved positions of power over others, and who are especially targeted by institutional rules, are among the self-less.

Oliver Williamson (1985) also adopts the self-interested assumption from the homo economicus model, but he combines it with other assumptions which depart from that model. Arguing for the concept of bounded rationality, Williamson assumes a gap between a decision maker's competence and the difficulty of the situation. In situations pertinent to institutional analysis, decision makers must make choices without the benefit of complete information. They are incapable of considering all possible actions and outcomes in the situation and of knowing how all actions link with outcomes. Williamson and other assume that decision makers cannot adopt a maximization strategy but can only try. They do the best they can and adapt as they learn more about the situation. Rules, Williamson argues, need specifically to address the gap in participants' knowledge about the full structure of the situations in which they find themselves.

Williamson presumes that people are often opportunistic or deceitful in their pursuit of self-interested objectives. They may withhold information vital to other participants in the situation, or they may even lie to others or cheat and trick them. Like Brennan and Buchanan, Williamson does not believe that people are generally as unattractive as his assumptions, but he thinks enough are to warrant these assumptions when engaging in institutional analysis. To assume honesty, which implies that people can merely promise each other to do what is right when unanticipated problems arise, over-simplifies the task of designing effective institutional rules.

Williamson emphasizes the configurational nature of individual attributes by noting that combining self-interest, deceit, and incomplete knowledge presents special challenges for institutional design. Alone, each attribute presents no special problem. If decision makers completely knew the details of the situation, for example, they could neutralize the deceitful self-interest in others by anticipating all future contingencies in current agreements. They could never be surprised. Similarly, if decision makers were incapable of fully understanding the situation, but completely honest with one another, they could avoid some problems merely by an exchange of promises.

Analysts have paid special attention to the calculation process assumed in the model of the decision maker. Herbert Simon (1978) distinguishes between procedural rationality, where people select among alternative strategies to follow when making decisions, and substantive rationality, where they actually make the decisions. His distinction is significant in recognizing that calculation processes or strategies can vary across situations. Sometimes decision makers will adopt rules of

thumb, routines, or habits from prior experience to guide their current choices. At other times they will adopt more sophisticated strategies. Ronald Heiner (1983) predicts that people will choose progressively less flexible strategies as conditions become more and more uncertain. They will disregard pertinent information and resort to habits and routines rather than deliberate over alternative courses of action. They do not even try to maximize net benefits to themselves.

The assumptions made about individuals interacting in situations affect the predictions that are made regarding results. Holding everything constant about a situation, an analyst who presumes that individuals are narrowly short-sighted and liable to engage in deceitful behavior will make different predictions about behavior than an analyst who assumes individuals adopt other regarding interests and long-run perspectives. Assumptions about availability of information and about the type of calculation strategies adopted also affect predictions about the likely outcomes to be achieved.

Modeling Institutional Rule Systems

Analysts who study institutions presume that if people do not like outcomes resulting from their interactions with one another they can change the rule systems governing their interactions and create new situations. New situations with new constraints and opportunities can result in new outcomes. Institutional analysis, thus, focuses on a fundamental way for humans to improve their living conditions.

Analysts Do Not Agree on a Language for Expressing the Concept of Institutional Arrangements

Many political economists readily use the term "rules" when referring to institutional arrangements. They see institutions as rules, some written but most unwritten, governing the behavior of people as they interact with one another. Brennan and Buchanan (1985: 16) even list some specific rules, including majority rule, periodic elections, restrictions on government's power to take, systematic accounting for public expenditure, and geographic structure of electoral arrangements. They call the list the "obvious rules of the political game". But other than a couple more examples elsewhere in their book, they do not elaborate on the kinds of rules that comprise institutional arrangements.

Oliver Williamson (1985) refers to various types of business contracts as alternative institutional arrangements or governance structures. Williamson is particularly interested in four types of governance structures: market, trilateral, bilateral, and unified governance. Market governance regulates exchange between two autonomous parties, who search for each other, negotiate and execute an agreement, and when finished go their separate ways. Trilateral governance is similar, except that the parties are more concerned about problems that might crop up during the life of the agreement, so they bring in a third party to help resolve disputes. Bilateral governance also anticipates problems between the transacting parties, but rather than bringing a third party into the arrangement the parties develop self-enforcing agreements or make what Williamson calls credible commitments. All the while, the parties remain autonomous. Unified governance is where the transacting parties give up their autonomy and join together under a single authority, as when firms merge.

Steven Cheung (1969; 1983) also analyzes institutional arrangements as types of contracts. Cheung distinguishes, for example, among fixed rent, share, and wage contracts in agricultural exchange. He also compares types of contracts as alternative ways of organizing teams of asset owners to produce goods and services. In one arrangement each asset owner in the production chain produces and markets his product to the next asset owner in the chain. The result is a series of product markets culminating in the final market to consumers. In an another arrangement, the asset owner sells the asset to another producer, letting the new owner carry out the production. In a third arrangement the asset owner retains ownership but surrenders use of the asset in exchange for an income. The third arrangement results in factor markets rather than the product markets of the first arrangement.

The Literature on Institutional Analysis Reveals a Need for a General Framework

It is possible to adopt a more general approach to the study of institutional arrangements than most work has so far pursued. Whereas, other analysts tend to identify specific structures such as rules of the political game, governance structures of economic firms, or alternative types of contracts, we identify alternative configurations of abstract rule sets (see E. Ostrom, 1986a; 1986b). Institutions, having the purpose of manipulating the structure of action situations, must be capable of directly affecting each of the seven elements of the situation. Thus, one can posit the existence of one rule category for each element of an action situation. One rule category directly affects the variety of positions in the situation. One affects the number of people who participate in the

situation. One affects actions allowable to each position in the situation. One affects outcomes allowable to each position in the situation. One affects linkages between actions and outcomes. One affects the language and channels for communication among participants in the situation. And one assigns payments and payoffs to the various actions and outcomes. The result is seven types of rules which are the minimally necessary rules to constitute an action situation.

> POSITION RULES specify the positions that people may assume as they interact with one another. The rules may specify as many different positions as there are participants or as few as a single position.
>
> BOUNDARY RULES specify conditions that people must meet in order to occupy each positon and the conditions required for people to leave those positions. Boundary rules are often called entry and exit rules.
>
> AUTHORITY RULES specify actions allowed for each position in the situation. If actions occur in a series, the rules specify the allowable sequences.
>
> SCOPE RULES specify the outcomes that participants in each position may, must, or must not affect in the situation.
>
> AGGREGATION RULES specify the process through which actions taken by individuals finally result in outcomes. Technology may make a number of alternative procedures possible, from which aggregation rules select one or more procedures.
>
> INFORMATION RULES specify channels of communication that may be established among participants in the situation and the language or form of that communication.
>
> PAYOFF RULES assign payments and payoffs (including cost and sanctions) to the allowable actions and outcomes distributing the payments and payoffs among participants in the situation.

Scholars defining institutions as sets of rules utilize one or more of these categories, although sometimes by many different names. Many references to rules are implied, rather than consciously and openly developed. As a result, analysts sometimes misinterpret institutional arrangements or misinterpret people's reaction to the arrangements (see

discussion in E. Ostrom, 1986a). The above rule categories provide a handy checklist for analysts, regardless of their method for distinguishing among arrangements, to guard against misrepresenting alternative institutional arrangements.

A critical feature of the rules approach is that the rule categories function in a configurational rather than separable manner. Each category's effect on the elements and dimensions of an action situation often depends on the status of the other rule categories. A given aggregation rule -- simple majority voting rule, for example -- generates a variety of action situations and thus behavior, depending on conditions in other rule categories. Analysts focusing on isolated rule categories, such as aggregation or voting rules, risk developing false conclusions. Analysts need to be conscious of conditions in all seven rule categories.

Rule Categories Provide a Device for Comparing Diverse Institutional Arrangements

A primary challenge for researchers is to develop results that cumulate with work by others. But often researchers develop idiosyncratic languages and concepts as they move into new areas of study, making literature comparisons and scientific cumulation difficult. Scientific progress relies on a more standardized approach. But standardization presents problems, too, in its tendency to foreclose potentially fruitful avenues of study, as researchers focus on common ground. Significantly, the rules approach to institutional analysis does not supplant other approaches. Rather, it provides a way to translate diverse approaches into a common framework.

Brennan and Buchanan's Conceptualization Translated

Brennan and Buchanan view institutional arrangements as rules, but they do not identify generic rules that might be found in all institutional arrangements and that might provide a device for comparison among alternative arrangements. They identify specific rules of some particular arrangements. They identify the rules of the political game, for example, to include: majority rule, periodic elections, restrictions on government's power to take, systematic accounting for public expenditure, and the geographic structure of electoral arrangements. Translated into generic rules, majority rule, indicating how decisions by individuals combine together to yield an outcome, corresponds to aggregation rules. Periodic elections, indicating that occupants of particular positions must stand for election at certain times, correspond to boundary rules. Restrictions on government's power to take property, depending on whether the restrictions are expressed in terms of actions allowable to officials or to outcomes regarding citizens' private property, correspond to either authority rules or scope rules. Authority rules would refer to restrictions on the actions that governmental officials can take regarding citizens' private property. Scope rules would refer to restrictions on the outcomes that governmental officials could affect. Depending on procedures detailed in the rules, the restrictions could also correspond to information rules and aggregation rules. Information rules would indicate how officials are to learn of citizens' private holdings and how officials are to inform citizens about intentions to take their property. The aggregation rules would indicate the sequence of actions required of officals and citizens before property can be taken.

Systematic accounting for public expenditure, indicating records that officials must keep of governmental expenditures and indicating who has access to the records, refers to information rules. Accounting procedures stipulate channels and the language for communication among officials and citizens. Geographic structure of electoral arrangements, depending on specifics, corresponds to position and boundary rules. If the rules distinguish among officials elected within subgeographic areas and officials elected at-large, they specify boundary rules for entering certain elected positions. If regional and at-large officials are assigned different powers and obligations, the electoral arrangements also distinguish between official positions.

A translation of Brennan's and Buchanan's rules of the political game into generic rules suggests that their list potentially addresses all of the categories. Additional details, however, are required to specify a complete configuration and to permit comparisons with alternative arrangements.

Williamson's Governance Structures Translated

Williamson distinguishes among market, bilateral, and other governance structures for organizing relationships between parties involved in exchange. His distinction focuses on provisions for resolving disputes during the exchange process, with the market structure resolving disputes by permitting parties easily to seek out more satisfactory partners for exchange and the bilateral structure resolving disputes by enabling parties to make credible commitments to each other. If either party in the market arrangement is unhappy with the exchange, the offended party can turn to a competitor for better service. The option, threatening to break the

relationship, tends to warn both parties against harming each other. If a party in the bilateral arrangement is unhappy with the exchange, the offended party can initiate a self-enforcing mechanism, such as a claim on a hostage or an item submitted as collateral, to persuade the other party to fulfill the agreement. The threat of the self-enforcing mechanism, which would impose additional costs on the offending party, tends to encourage both parties to fulfill the agreement.

Figure 2 translates both arrangements into generic rule terminology, permitting a comparison of the position, boundary, authority, scope, aggregation, payoff, and information rules of both governance structures. According to Williamson's distinctions between market and bilateral governance structures, all rule categories except the scope and payoff rules differ between the two arrangements. Position rules change to reflect the special relationship that develops between the parties to an exchange in a bilateral arrangement. All competitor buyers and sellers are no longer on the equal footing that exists in the market arrangement, because parties to a past exchange relationship claim an advantage over competitors. Their investments to conduct previous exchanges with each other increase their dependence on each other, differentiating them from competitors.

[Figure 2 About Here]

The differentiation appears in other rule categories as well. Parties to past exchanges have different conditions for entry into and exit from continued exchange situations than the other parties experience, again, reflecting the special relationship that develops between parties once they have conducted an exchange with one another. Williamson notes that because opportunism threatens exchanges between parties in a "committed"

relationship, agreements often limit adjustment that parties may propose for continued exchange to easily monitored areas. The limitations reduce the temptation for parties to deceive each other. Williamson notes that transacting parties also tend to develop specialized signals for communicating with each other as they come to understand each other's idiosyncracies and special needs during a history of exchanges.

Cheung's Contracts Translated

Steven Cheung (1983) elaborates upon Ronald Coases's study of the nature of the economic firm and shows that the firm is a description of alternative contractual arrangements between buyers and sellers. He considers two particular alternatives, one where each input owner individually makes a product and sells it to a customer who combines the several products into a finished good, and the other where input owners contract with an agent who buys the services of the inputs and assembles a finished product. The customer, rather than buying several unfinished products, as in the first arrangement, buys one finished product from the agent. The first arrangement results in several product markets with exchanges between each input owner and the customer. The second arrangement results in several factor markets with exchanges between input owners and the agent. In either arrangement, input owners receive payments for the services of their inputs and the customer receives a final product. Cheung studies the relative advantages of the two arrangements.

Figure 3 translates Cheung's two contractual arrangements into rule terminology. All seven rule categories change with the shift from the product to the factor market arrangement. The factor market arrangement creates an additional position for the agent who assembles the services

from a variety of input owners. The other six rule categories account for the additional position, specifying entry into and exit from the agent position, actions the agent is allowed to take, outcomes the agent is allowed to pursue, the effect the agent has on procedures for aggregating individuals' actions into outcomes, payments to and from the agent, and new channels for communicating with the agent. The rules also register changes that the agent position creates for actions allowed to occupants in input owner and customer positions and for communications between these positions.

[Figure 3 About Here]

The rules framework is especially useful for making comparisons among institutional analyses by different writers. The framework shows, for example, that the market arrangement described by Williamson is essentially the same as the product market arrangement described by Cheung. The framework also suggests that either the product or factor market arrangement described by Cheung could develop into the bilateral governance structure described by Williamson, if physical and technical conditions warrant.

Modeling Physical Conditions

The physical world sets basic, if somewhat elastic, limits on human activity. The limits expand and contract with alternative technologies, enabling people to use the physical world in new and different ways but still only within certain boundaries.

Analysts recognize physical limits on human interaction when they incorporate technological production functions and types of goods, such as

public and private goods and common pool resources, into their analyses. Public goods, in contrast to private goods, physically hamper exchange between individuals in the marketplace, resulting in well known conclusions in economic theory about market failure. Contrary to Adam Smith's picture of a hidden hand in the marketplace directing actions by self interested individuals toward everyone's benefit, the theory of market failure with public goods predicts that everyone loses.

Since the advent of public goods theory (see Bowen, 1943-44; Head, 1962; and Samuelson, 1954; 1955) analysts have described the physical nature of goods by referring to divisibility and excludability attributes. Divisibility -- sometimes called subtractibility, rivalness, or jointness -- describes the degree to which a tangible or intangible good can be divided among individual users. Private goods, such as shirts and pencils, are divisible, with only one person able to use a unit of the good at one time. Public goods, such as clean air and safe city streets, are indivisible, with many people able to use a unit of the good at one time. Excludability describes the ease with which individuals appropriating a good can prevent others from appropriating the same unit of the good. Thus, private goods, such as shirts and pencils, which people can keep from one another, are excludable, and public goods, such as clean air and safe streets, which people cannot keep from one another, are nonexcludable (see V. Ostrom and E. Ostrom, 1977).

Attributes Other Than Divisibility and Excludability are Relevant to the Structure of Action Situations

Imagine an underground aquifer and an urban air shed equally indivisible and equally nonexcludable, and suppose that people display

equal preferences for the water and air. Analysis using divisibility and exclusion would conclude that because market institutions would fail to govern use and exchange of such goods effectively, some form of collective decision making arrangement should replace the market. Moreover, since the relevant attributes of the aquifer and air shed appear the same, conventional analysis might conclude that the same collective arrangement would suffice for governing the use of both goods.

The conclusion, however, would not be correct. Focusing only on divisibility and excludability attributes ignores other attributes relevant to institutional analysis. Given prevailing technology, water usage is more easily measured than air usage. Water is more easily extracted and distinguished from a parent source than air. Also, because air in the parent source renews itself more rapidly than water, air quality is more easily improved than water quality. An identical institutional arrangement for governing both the aquifer and air shed, therefore, might effectively manage the use of one resource but not the other. Physical conditions of the two resources are not the same, although the currently used public-private good physical distinctions do not capture the relevant differences.

Primary and Secondary Physical Attributes

Primary physical attributes, such as group scope (ie., divisibility), extractability, durability, perishability, renewability, sensory appeal, and consumability, in combination with technology, institutional arrangements, and community attributes form the structure of action situations. Group scope, meaning the number of people who can simultaneously use a good without affecting its availability to others, is a measure of the divisibility of a good. A group scope equal to one

defines perfectly divisible goods. A group scope equal to infinity defines perfectly indivisible goods.

Extractability describes whether the part of a good used (the appropriation unit) physically separates from the parent source (the resource unit) of the good. Appropriation units of extractable goods physically separate from and are physically distinguishable from the resource units. An acre-foot of water as a unit of appropriation, separates from and is distinguishable from the resource unit, the underground aquifer. The extraction physically diminishes the resource unit of the good, as removing the acre-foot of water from the aquifer reduces the volume in the aquifer. Appropriation units of nonextractable goods, such as transits across a bridge, remain part of the resource unit during use. Use, except for wear and tear, does not diminish the resource unit. Because people use appropriation units of nonextractable goods by occupying the resource units, analysts may not even bother to draw a distinction between the appropriation unit and the resource unit. The distinction in institutional analysis, however, is frequently useful (see Minasian, 1979).

Durability describes how often a good can be used before it begins to deteriorate noticeably. People can use durable goods many times but nondurable goods only once or a few times before quality deteriorates. Durable goods, like indivisible goods, can be used by more than one person but not at the same time.

Perishability describes how the passage of time affects a good. Perishable goods deteriorate rapidly, and nonperishable goods deteriorate slowly. Time, rather than use, is the critical factor, distinguishing perishability from durability. Renewability describes the ability of goods

to replenish themselves naturally after they have been diminished by use or time. Renewable goods restore themselves; nonrenewable goods do not. Renewable goods restore themselves at varying rates, often manipulated by human cultivation.

Sensory appeal is perhaps the most obscure of the physical attributes, at least in analytical literature. Analysts rarely recognize sensory appeal as such but refer to this attribute through other physical attributes. Sensory appeal describes how a good affects the five physical senses of sight, touch, smell, taste, and hearing. Goods that activate none of the senses make their presence known indirectly by affecting other objects, such as a metering device, that do activate the senses. Otherwise, nonsensory goods, such as perceived status and safety, appeal only to people's imaginations.

Consumability describes the ease with which goods transform into what Kelvin Lancaster (1966) calls consumption characteristics, which are the features that give consumers satisfaction. All goods are consumable to some degree, but easily consumed goods require relatively few resources for transformation into consumption characteristics. Analysts investigating activity on the consumer's side of market exchange (Stigler and Becker, 1977) and coproduction in the public sector (Parks, et.al., 1981; Percy, 1981; and Kiser, 1984) have been paying increasing attention to the consumability attribute. Those investigating coproduction have emphasized a relationship with institutional arrangements.

Analyses of the effect of physical and technological conditions on action situations often identify what might be called secondary physical attributes which depend on the presence of one or more primary attributes. Secondary attributes include selectivity, distributability, rejectability, and measurability.

Selectivity describes a good's effect on a distributor's ability to choose among individuals to receive the good (Plott and Meyer, 1975). Writers sometimes use excludability to identify this attribute, but usually they do not distinguish between the effects of physical conditions and institutional rules on the action situation. In the literature, excludability results from both sources. We use selectivity to address just the physical effect. Selective goods physically permit distributors to choose who will receive the good and who will not. Nonselective goods physically make such choices difficult.

Selectivity depends partly on the primary attribute of divisibility. Given consumer demand and technology, selectivity tends to diminish as the group scope measure of the divisibility attribute increases. Larger group scopes indicate larger spatial dimensions, and larger spatial dimensions can create difficult surveillance and monitoring challenges. An indivisible air shed covering a broad geographic area and thus having a large group scope would frustrate a distributor who would want to select among individuals to use the air shed. The distributor would have to monitor the perimeters of the air shed and intercept would-be users. By contrast, a divisible apple, which has a group scope of one, would pose no selectivity problem. A distributor could easily see when an ineligible person is attempting to acquire the apple.

Conversely, rather than preventing a person from appropriating an output, a distributor may want to force it on others. The distributability attribute describes the physical ease of doing that. Like selectivity, distributability addresses only physical and not institutional effects on the action situation.

Distributability is a secondary attribute, because it depends partly on the divisibility of the output. Given technology and a level of resistance by would-be recipients, divisible outputs tend to frustrate a distributor who would try to force outputs onto others. The distributor would have to take each divisible unit, to the location of each recipient. Consider the problems, for example, that a gardener with surplus zucchini during harvest season, would have forcing the surplus on others. Indivisible outputs, by contrast, are part of the larger environment automatically distributed to large numbers of people when produced. A producer could distribute smoke, for example, to a population from relatively few geographic locations.

Divisibility has opposite effects on selectivity and distributability. A small group scope, as in private goods, tends to make selectivity easier and distributability more difficult, while a large group scope, as in public goods, tends to make selectivity more difficult and distributability easier. The relationship implies that free riding, which takes place with difficult selectivity, and forced riding, which takes place with easy distributability, both will tend to be more prevalent with indivisible than divisible goods. Correspondence between free and forced riding situations, however, is far from perfect. Easy distributability does not always create forced riding situations, even when the physical attribute is combined with permissive rules, because physical conditions do not always require recipients to keep outputs they have been forced to receive. Depending on an output's rejectability attribute, recipients may be able to dispose of or simply ignore the output. Rejectability describes how an output physically limits a recipient's ability to avoid it.

Like other secondary attributes, rejectability depends partly on divisibility. Given technology and an effort by distributors to force appropriation, rejectability is more difficult for outputs with large group scopes. Large group scopes, usually associated with large spatial dimensions, require that people move significant distances to escape the effects of the output. Foul air, for example, is less rejectable than unwanted zucchini. This association supports the forced riding result from divisibility's effect on the distributability attribute.

Rejectability also depends on the perishability attribute. Perishable goods are usually rejectable. A loud noise, which quickly dissipates, is more rejectable than unsightly scars from open-pit mining, which linger for decades. Both indivisible outputs tend to create forced riding situations, but the effect is more persistent with nonperishable outputs.

The final secondary attribute, measurability, describes the ease in calculating an output's physical dimensions. Like other secondary attributes, it depends partly on the divisibility attribute. Given technology, divisible outputs are more measurable than indivisible outputs. Divisible outputs, such as apples, present relatively narrow perimeters, which people can gauge more easily than broad, vague perimeters of indivisible outputs, such as polluted air. Indivisible outputs often require elaborate measuring devices.

But measurability also depends on sensory appeal, which probably exerts an even greater effect. Measurement usually relies on one or more of the physical senses. The more senses that an output stimulates the easier it is to measure. The effect can override the influence of the divisibility attribute, with the result that an indivisible output such as polluted air, which stimulates sight and smell, is easier to measure than indivisible public safety, which stimulates none of the senses.

Physical Attributes Affect the Structure of the Action Situation

Analysts investigating the origins of an action situation may study the effects of physical conditions. Analyses of free rider possibilities with indivisible goods recognize an additional action that indivisible goods introduce to a situation. Indivisibility, by making selectivity more difficult, permits a potential user to postpone appropriating a good until someone else has paid for it; then the person can use it free of charge. That action is not possible with divisible goods. A person who postpones appropriating a divisible good until someone else pays for it will not benefit from the good's availability. Whether the person buys or merely takes it from the purchaser, he or she will be paying some sort of price, if only in the physical effort of having to steal the good.

The divisibility attribute also affects the linkages between actions and outcomes. If rules permit open access to a good, a small group scope can create a situation where a person will pay a price expecting to receive a good only to have it appropriated by others. The act of paying the price may link with an outcome of receiving nothing. A large group scope does not create that linkage. Even when a person who does not pay appropriates an indivisible good, the good is still available to the person who pays.

Effects of divisibility on various elements of the situation can also be expressed as affecting the situation's dimensions. The effect on action-outcome linkages, also affects the dimension of relative power. In open access cases, the possibility of paying for a divisible good and not being able to use it because someone else takes it, reduces the decision maker's power in comparison to situations involving an indivisible good.

Analysts can follow a similar procedure with any of the physical attributes. Each attribute will affect the elements and dimensions of the

action situation in ways that decision makers may interpret as creating incentives and disincentives for particular choices. Specific theories of action develop these cause and effect relationships. Institutional analysts will pay special attention to variation in physical effects on situations when physical attributes are combined with alternative rules for governing behavior in the situations.

Modeling the Community

No one really acts in private, for others are always "looking on," even when physically absent from the situation. The metatheoretical framework, incorporating the community element, recognizes the social context of individual action.

What is the Community?

The concept of community seems to defy analysts' attempts to settle on common definitions. Some writers define the community as the collection of people who interact with one another over a common issue. Only those who participate by making choices in the situation are members of the community. Other writers broaden the definition and define the community as people who are members of the organization within which interaction occurs. All members of the organization need not participate in the action situation. The broader definition recognizes that the organization may bring additional resources to the action situation and that people other than those participating may influence and be influenced by outcomes from the situation.

Another definition focuses on the scope of influence but without reference to organizational identity. The definition of community includes all who either influence the actions by participants in a situation or who are influenced by those actions even though they might not participate themselves. The concept of influence leads many writers to broaden the definition still further, defining community as all people within a culture. They influence one another as they speak the same language, recognize common cultural symbols, and experience a common history. There is no single correct definition. Whether an analyst adopts a narrow or broad definition of community depends on the situation being investigated and the focus of the analysis. But to avoid confusion, analysts need to be explicit about their definitions. Unfortunately, many are not, as seen in Sergiovanni and Corbally's (1984) edited volume on culture and organizational leadership, where contributors variously use narrow and broad definitions of community without recognizing their differences.

The Community Element Affects Attributes of the Decision Maker

Decision makers bring resources, attitudes, values, and strategies for action to the situation. While analysts often assume these attributes as given, they emanate largely from the community within which the decision makers reside.

Resources

The availability of resources to a decision maker often varies with his or her community. A person from an industrialized nation, for example, can usually draw upon more resources in a given situation than a person from the Third World. A person from a metropolitan area of the United States can usually draw upon more resources than a person from Appalachia.

Values

Economists, justifying their approach of accepting preferences as given rather than investigating the origins of those preferences, like to assert that there is no accounting for tastes. They are what they are. Some analysts, however, are beginning to consider the social origins of values and preferences, as Thorstein Veblen did in the early 1900s.

Social pressures on individuals to adopt particular values as their own is a critical ingredient in the social glue that binds people together and enables them to interact with one another on a regular basis. Adopting common values, people constrain and direct their behavior in predictable ways, enabling them to construct institutional arrangements and to abide within the confines of those arrangements. People, even without the threat of an external enforcer, enforce rules upon themselves, thus, making their institutional arrangements work (V. Ostrom, 1986).

While much self-enforcement derives from people's recognition that they privately benefit from the general obedience to institutional constraints, there are many occasions when people abide by constraints even at personal sacrifice. Their lives would be easier without the constraints, and they could violate the arrangements without threatening the entire structure. Yet, they do not capitalize on the situation for their own personal advantage.

Lord Moulton (1927) calls such self-restraint manners and extends the behavior to situations only loosely constrained by institutional rules. He distinguishes among situations where actions are expressly prohibited by law, where there are no prohibitions whatsoever, and where behavior is governed by manners. Manners affect the set of alternative actions when people are free in a legalistic but not social sense to choose among a wide

variety of actions. Others within the community hope that the decision maker will not exercise his or her legal freedom but will constrain his or her choices to those constrained by shared values.

Manners are an expression of social pressure to behave in accordance with values that prevail within the community. Initially a person may not personally accept the values but still acceeds to the social pressure. After a time, however, the person may grow unaware of the social pressure but still acceed, because he or she has internalized the community's values.

James March (1984) analyzes the effect of shared values on decision makers in large organizations. March notes that leaders of business corporations and governmental bureaucracies resemble one another so much that they could be transferred among the organizations with negligible effect. Most leaders, molded by common community values, tend to conduct themselves in basically the same way as other leaders. The process of promotion within organizations screens out candidates whose values and perceptions are incompatible with those that prevail within the organization or among large organizations in general. Thus, people ambitious to gain leadership positions adopt generally prevalent values as their own.

Sergiovanni (1984) and Bennis (1984) also discuss the manner in which community values affect the values of individual decision makers, but they focus on people below leadership positions. Sergiovanni argues that communal pressure on members to adopt particular values is often vague until refined in the example and admonitions of organizational leaders. Institutional arrangements of organizations enable leaders to impress their interpretations of communal values on people lower in the hierarchy and to

persuade them to adopt similar values. Bennis thinks that the leader's role even transcends powers granted by institutional arrangements. By virtue of their position, leaders are able to inspire as well as direct their followers. As Bennis writes, leaders have the capacity "to reach the souls of others in a fashion which raises human consciousness, builds meanings, and inspires human intent. . ." (p. 70). Leaders, in other words, can affect the values and perceptions of other participants in the organization.

Strategies

James March also considers how values of a community influence strategies that individual decision makers follow when choosing among alternative courses of action. He asserts, for example, that because the community generally places a high value on efficiency in organizations, leaders act so as to appear efficient even when organizational structure and the complexity of situations prohibit it. Associating efficiency and control, leaders enact strategies to create the illusion that they control behavior within and the outcomes from their organization. They command detailed information from all corners of their organization, hoping to convey to observers that they know precisely what their organization is doing, when in truth, they cannot know. In fact, they do not even attempt to learn about detailed activities in their organization. They command the information, but they do not use it.

The Community Affects the Structure of the Action Situation

The community directly influences both the attributes of the decision maker and the structure of the action situation. Distinguishing between

the two effects, however, is not always easy in practice. Analysts can agree that communal attributes somehow affect actions that people take but disagree whether the influence is working through attributes of decision makers or through the structure of the situation.

Patterns of Resource Distribution

As the community helps make resources available to individual decision makers, it distributes the resources among decision makers in variable patterns. Analysts generally refer to the patterns as exhibiting greater and lesser degrees of equality. Distributional patterns can affect the number of participants interacting within the situation. Participation either as a seller or as a buyer in market transactions, for example, requires that each participant have access at least to some minimum amount of resources. Equal distribution may grant more people access to the required minimum, enabling more to participate in a given market situation than an unequal distribution of the same resource base would.

Distributional patterns can also affect the linkages between actions and outcomes for individual decision makers. A buyer offering a particular price in a market situation, when resources are equally distributed may be disappointed to learn that other buyers have offered higher prices, preventing him from acquiring the good. A less equal distribution, reducing competition, might enable the same buyer to acquire the good with his offer.

Distributional patterns can affect the opportunity, power, and control of individuals in a situation and the relationship among individuals. Opportunity, measured by a person's range of potential actions and outcomes, and control, measured by the likelihood that particular actions

will result in particular outcomes, vary with shifts in resource distribution. The shifts alternatively expand and shrink options, depending on the person's location in the distribution.

Values

Like resource distributions, the distribution of values among members of a community also affects the structure of the action situation. Action situations appear differently to people in communities that share common values than in communities with widely diverging values, even when all else is the same. A member of a community that shares many common values probably can predict the outcomes from particular actions with greater confidence than a member of a community that shares few values. A member of a community that shares many values can guess how other participants in a symmetrical situation will act by referring to his or her own values. Because other participants' values are similar, a person can presume that their actions in the situation will also be similar. A member of a community which is characterized by widely diverging values may not know the values held by many others in the community and, therefore, has little basis for guessing how others in the situation will act. Ability to predict other participants' actions is an important aspect of power and control over one's own well being.

Shared Understanding

People can choose whether to obey the artifactual constraints that institutional arrangements impose on a situation. The choice depends on their own ethical codes and enforcement mechanisms of an arrangement, but it also depends on people's understanding of the constraints. People may

think they are obeying the constraints, while other participants in the situation disagree. Vincent Ostrom (1980; 1985) stresses that rules are expressed in words that are necessarily ambiguous when applied to specific conditions and situations. Rules are subject to a variety of interpretations. Agreement among participants depends on the common basis for interpretation present in shared language, experience, and common culture. Common culture and shared experience tend to cause people to develop similar perspectives which result in similar interpretations of rules. Without the common bases, interpretations probably vary widely. To an outside observer the same rules may appear to apply to all participants, but in practice they do not. The disagreement, according to John Taylor (1966), may be enough to destroy the community, which depends on shared mutual respect for members' rights.

Institutional Arrangements Can Directly Affect Attributes of the Community

The role of shared understanding as a community attribute opens a direct connection between the institutional and community elements of the framework. While analysts generally focus on effects that community attributes exert on the structure of action situations and on attributes of individual decision makers, a few have considered ways that institutional arrangements directly affect community attributes. Donald Schon (1984), writing about leadership in large organizations, recommends that leaders cultivate procedures for communication and reflection as they participate in their organization's day to day operations. He notes that organizational procedures, such as keeping negative information from supervisors and suppressing conflict among colleagues, frequently prohibit

rather than encourage communication and reflection within organizations. Schon advises countervailing procedures so that leaders and others in the organization can learn from each others' experience. Otherwise, experiences will be confined to individuals rather than shared, and each person in the organization, as a result, will have to rely excessively on trial and error.

Schon's argument recognizes that institutional arrangements for communication directly affect such community attributes as shared experience. Arrangements encouraging communication enable members of an organization to share their several experiences. The shared experience, then, affects subsequent actions situations and ultimately outcomes from interaction within the organization.

Community Attributes Affect Institutional Arrangements

The connection between institutional arrangements and community attributes can also flow in the opposite direction from community attributes to institutional arrangements. This connection, though, is indirect, involving two levels of action -- an operational and a collective level.

John Meyer (1984) analyzes the community's effect on institutional arrangements in a way that resembles March's analysis of the community's effect on attributes of the decision maker. He asserts that the community values for efficiency and informed action cause people to design organizational production and monitoring procedures to appear efficient even when the information requirements are too high.

The result, according to Meyer, is that the organization develops parallel institutional structures -- one that satisfies the community value

for informed, precise, efficient action and one that permits the organization to function in the ambiguous real world. One structure is visible to outside observers as window dressing, and the other is used by members of the organization as they engage in daily activities. Meyer laments that the window dressing arrangement sometimes intrudes upon the real operations of the organization, as people are not fully aware of the operational structure.

In terms of the metatheoretical framework, Meyer's argument begins in a collective choice situation, where decisions result in an institutional structure which constrains interactions among people in future operational situations. Attributes of the community identified by Meyer influence situations and decision makers as they make collective choices about the design of institutional arrangements. Those arrangements subsequently govern those same people and perhaps others as they interact with one another. Meyer's point is that community attributes exercised in collective choice often can result in ineffective, false-front institutional arrangements.

Some Concluding Reflections

This approach to the study of action and outcomes in the context of situations constituted by rules, physical conditions and technology, and the nature of a community raises some fundamental questions about the study of social behavior. Using this approach, we can begin to identify and understand some of the fundamental building blocks used to construct human organization in all societies. While there are many specific components to be examined in this approach, they form the foundation for genuinely

comparative analysis. Two of the foundations identified in this approach -- rules and community -- are basically cognitive in nature. One cannot say they are operative until real people in real situations learn the rules and meld them with their cultural heritage into an ongoing activity with predictability and meaning for the participants. One can treat rules and community as types of variables in an analytical scheme -- as we do in the framework -- these variables do not operate in the world unless they are part of the cognitive frame of the participants. The information that participants have in an action situation is also entirely a cognitive variable.

That fundamental building blocks of institutional arrangements are cognitive in nature raises some difficult questions concerning the stability of institutions and, in particular, multi-organizational arrangements, over time. Institutional arrangements are tools that individuals use to accomplish objectives of importance to them. Effective use of all tools requires that the use of the tool itself be relatively unconscious or tacit. A master artisan pays primary attention to what he or she is trying to accomplish. The tools being used are almost extensions of the self.

This tacit knowledge of tools in general, and institutional arrangements as particular tools, represents a threat to the continued knowledge about how to use particular types of tools. The transmission of tacit knowledge is more difficult than the transmission of knowledge that has systematically been converted into a written and formal science. It is still the case that good cabinetmakers initially learn their skills by working with master cabinetmakers. World class athletes all have coaches who continuously help them to preserve or enhance their skills by

monitoring their performance and making more conscious the tacit skills acquired by the athelete. Good managers or effective "facilitators" learn these skills primarily by watching the "master craftsmen" of organizational life. The importance of a book like Chester Barnard's (1938), The Functions of the Executive, is that Barnard attempted to make explicit some of these implicit tools.

All institutional arrangements must be reproduced by teaching new generations how to construct and use the institutional tools they use in structuring human organization. So-called "primitive" societies tend to reproduce themselves relatively well over long periods of time by stressing adherence to a small set of well defined rules and cultural values. Modern societies are characterized by a much richer set of rules and cultural values which are context specific. Thus, the set of rules used in one context differs from the set of rules used in another context. Those rules used most frequently by individuals in their everyday life are likely to be transmitted from one generation to the next without great variation. But, those rules which are less frequently used are subject to a greater degree of uncertainty across generations, even across "generations" of workers in a single organization, let alone, "generations" of participants in loosely structured multi-organizational arrangements.

Modern societies rely extensively on formal education to teach citizens how to reproduce essential institutional structures. To the extent that formal education rests on untested or invalid theories, some of the tacit skills acquired by one generation of individuals may be lost by the next generation. Given the relative inattention paid to theories of institutions in the last half century of the social sciences, we are at a rather difficult juncture in which many of the "common sense" theories of

institutions may be valid only under very constrained circumstances. Much of the work in modern social science does not provide the theoretical tools that are needed to help citizens reproduce effective institutions over time. Some scholars are devoted to proving general theorems about predicted results in extremely abstract and simplified models of what are usually complexly ordered situations. Others reject this approach and write thick descriptions of what "real" actors did in "real" situations, but do so in such a fashion that little can be learned of a more general nature from the descriptions. Little effort has been expended on how to construct an analysis of complex social arrangements so as to derive answers to questions about why individuals obtain the results that they do in particular types of situations.

The framework described above presents an alternative method to that of the search for general laws using highly simplified characterizations of human organization, on the one hand, or the search for an understanding of the unique without an effort to achieve cumulation, on the other. Using the framework to develop particular theories and specified models of particular types of situations should enable us to develop genuinely a comparative social science of interest both to scholars and to citizens who must utilize a method of institutional analysis in constructing solutions to the problems that they face.

Figure 1

Elements of the Action Situation

Initial Situation	Subsequent Situations	
Positions:		
Potential Buyer Potential Seller	Potential Buyer Potential Seller	Past Buyer Past Seller
Number of Participants:		
Large number in each position	Large number in the potential buyer and seller positions, but only one participant in the past buyer and seller positions	
Possible Actions:		
Offers by potential sellers Bids by potential buyers	Offers by potential sellers and by the past seller Bids by potential buyers and by the past buyer	
Potential Outcomes:		
Revenue to sellers Product to buyers	Revenue to sellers Product to buyers	
Linkages Between Actions and Outcomes:		
No action taken by buyers or sellers affect price at which goods exchanged	Past buyers and sellers can affect price at which goods are exchanged Potential buyers and sellers have better capacity to affect outcomes	
Payments and Payoffs:		
Sellers retain residual income after costs of production are paid Buyers retain residual utility after cost of goods are paid	Sellers retain residual income after costs of production are paid Buyers retain residual utility after cost of goods are paid	
Information Flows:		
Bids and offers communicated	Bids and offers communicated plus a specialized language develops between the past buyer and seller	

Figure 2

Williamson's Governance Structures
Translated Into Generic Rule Language

Market Governance	Bilateral Governance
Position Rules	
The positions of potential buyer and potential producer-seller are authorized.	The positions of potential buyer, potential producer-seller, past buyer, and past producer-seller are authorized.
Boundary Rules	
Few requirements exist regarding entry or exit from buyer and seller positions except for the resources needed to enter the market.	The same conditions for potential buyers and potential producer-sellers as in market arrangement. Past buyer and past producer-seller must have conducted successful exchange with each other during a previous period. Past buyer must present a "hostage" to signal a commitment for continuing the exchange relationship.
Authority Rules	
Potential buyers are allowed to bid on alternative features, quantities, and prices for outputs and on times and places for delivery. Potential producer-sellers are allowed to offer alternative features, quantities, and prices for outputs and alternative times and places for delivery. Participants can change prices asked and bids preferred without prior consultation.	Potential buyers and producer-sellers are allowed the same actions as in the market arrangement. Past buyer and producer-seller must bid and offer the same features, prices, times, and places as in the past exchange. Any changes in prospective transactions other than quantity needs prior negotiation.
Scope Rules	
Potential buyers are allowed to obtain outputs and satisfaction. Potential producer-sellers are allowed to obtain revenues.	Potential buyers and producer-sellers are allowed the same outcomes as allowed in the market arrangement. Past buyer and producer-seller are also allowed these same outcomes.

Aggregation Rules

Bids and offers are allowed at any time. An exchange requires unanimous agreement between a potential buyer and a potential producer-seller.

Contract specifies the time for new bids and offers. Unanimous agreement required as in market arrangement.

Information Rules

Channels are created for communication between all potential buyers and potential producer-sellers. Language for communication includes monetary designations, quantity measurements, and qualitative designations.

Channels and language are the same as in the market arrangement. Additional channels can develop between the past buyer and producer-seller to permit faster more direct communication. The language between the past buyer and producer-seller is refined to permit more precise and subtle communication.

Payoff Rules

Producer-sellers independently pay all costs and retain all post-taxation residuals. Buyers pay only for product received and retain residual utility.

Producer-sellers and buyers may share some specialized costs of production and both retain post-taxation residuals.

Figure 3

Cheung's Contractual Arrangements
Translated Into Generic Rule Language

Product Markets Arrangement	Factor Markets Arrangement
Position Rules	
The positions of input owner and customer are authorized.	The positions of input owner, customer, and agent who buys the services of inputs are authorized.
Boundary Rules	
Entry into input owner position requires that the person possess a relevant economic asset. Entry into the customer position requires that the person possess means sufficient to purchase products of the inputs.	Entry into input owner and customer positions is the same as in the product markets arrangement. Entry into the agent position requires that the person possess the ability to acquire and organize the services of several inputs.
Authority Rules	
Input owners are allowed to make alternative offers of product quantities and prices to customer. Customer is allowed to make alternative bids to input owners.	Input owners are allowed to make alternative long-term offers of services and prices to agent. Agent is allowed to make alternative long-term bids to input owners and alternative offers of product quantities and prices to customer. On a day-to-day basis agent is authorized to command the use of input resources as agent desires within confines of long-term agreement. Customer is allowed to make alternative bids to agent.
Scope Rules	
Input owners are allowed to acquire various levels of income. Customer is allowed to acquire various quantities of product and levels of satisfaction.	Input owners are allowed to acquire various levels of income. Customer is allowed to acquire various quantities of product and levels of satisfaction. Agent is allowed to produce products, but limited in the effects that can be made on input factors on the environment.

Aggregation Rules	
Income to input owners and satisfaction to customer depends on unanimous agreement between an input owner and a customer.	Income to input owner, profit to agent, and satisfaction to customer depends on unanimous agreement between an input owner and an agent and unanimous agreement between an agent and a customer.
Information Rules	
Channels for communication exist between input owners and customers. Language permits communication about products and prices.	Channels for communication exist between input owners and agent and for communication between agent and customer. Language permits communication about input services and service prices and about products and product prices.
Payoff Rules	
Input owners and customers retain post-taxation residuals.	Certain input owners (such as labor) have claims to income from agents prior to other impact owners (such as capital). Agent bares the risk of post-taxation residuals not covering payoffs to input owners.

Footnotes

[1]In Kiser and E. Ostrom (1982: 186) we used the term "attribute" to refer both to elements of a situation and emergent properties of a situation. In one earlier effort, E. Ostrom (1983) distinguished between "elements of a situation" (which are those described above) and "attributes about a situation as a whole" (which included number of repetitions and linkage to other situations).

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