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FOREWORD TO: COLLECTIVE ACTION: THEORY AND APPLICATIONS

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Collective Action

Theory and Applications

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Foreword

Mancur Olson

Though most scholarly and scientific publications are pertinent only to researchers in a single specialty, this book by Todd Sandler should be significant for economists in many different specialties, for serious students of the other social sciences, for applied game theorists, and for reading assignments in diverse courses. Perhaps I can, using the license usually allowed in a foreword, make the exceptionally wide relevance of this book apparent by setting out two "laws" or aphorisms that, in an evocative way, subsume a large part of economics and, indeed, all social sciences.

The first law is that "sometimes, when each individual considers only his or her interests, a collectively rational outcome emerges automatically"—the famous invisible hand coordinates the self-regarding efforts of the individuals involved and ensures an outcome that is socially efficient (in the familiar Paretian sense that no one could be made better off without someone else being made worse off). The second law is that "sometimes, the first law does not hold: no matter how intelligently each individual pursues his or her interest, no socially rational outcome can emerge spontaneously"—only a guiding hand or appropriate institution can bring about outcomes that are collectively efficient. These two aphorisms have a most serious and general purpose: almost all of economics and social science falls under one or the other of them.

Todd Sandler is not guilty of writing so brashly as I just have about "laws," but he has put forth what I call the second law in a most cautious and understated way: as he puts it in this book, "individual rationality is not sufficient for collective rationality." His book deals with the whole domain of this proposition—and that is why it is relevant, not only to economists in many different specialties, but also to serious readers in other social sciences and to many students of game theory and of environmental problems as well.

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Since individual rationality is not sufficient for group rationality, there is no reason to suppose that a group of individuals will act in their common interest. The aggregate gains to a group from collective action could greatly exceed the total costs of that action, but it by no means follows from this that the collective action would occur, no matter how rational and intelligent the individuals in that group might be. Admittedly, there are groups whose size, circumstances, or institutional arrangements establish a presumption that they will normally act in their common interest. But there are many other cases—both important and commonplace—where we can be confident that groups will undertake little or no collective action even when the net gains to the group from doing so would be immense.

What keeps groups of rational individuals from acting rationally in their collective interest? The most notable thing that prevents this is that, in many situations, the benefits of any collective action go to every individual in some group, whether or not the individual made any contribution to the costs of collective action. In other words, the benefits of collective action are normally indivisible in the sense that, if they are made available to one person in a group they are thereby automatically also supplied to everyone in the group. As is by now widely known, nonpurchasers cannot be excluded from the consumption of the "collective goods" or "public goods" that collective action provides.

It is not only those services that governments have traditionally provided, such as pollution abatement, flood control, law and order, and defense, that are collective goods, but also the services provided by any nongovernmental or private association or informal group that seeks to achieve a common purpose. Whenever neighbors seek to beautify their neighborhood, or a trade association lobbies for a tariff to increase the profits of the firms in its industry, or a collusion or cartel seeks higher prices or wages in some market by restricting the supply, or a group of countries seeks to deal with a common enemy through a defense alliance or a transnational environmental problem through an international organization, it is a collective good that is being sought. Whether we are considering collective action that everyone agrees is needed for a socially rational outcome, such as flood control or the prevention of contagious disease, or whether we are thinking of a cartel or lobby that is seeking monopoly prices or special-interest legislation that is inconsistent with a rational allocation of resources for the larger society, it remains true that the benefits of any collective action go to everyone in the relevant group, industry, country, or category, whether or not they contributed to the cost of the collective action.

Since the benefits of any collective action go to every individual in a group whether or not that individual has borne any of the costs of the collective action, it follows that, unless the group is small or meets certain other special conditions, the collective good will *not* be provided through market mechanisms or other straightforward and voluntary arrangements. Just as governments require compulsory taxation to finance public goods, so large, nongovernmental organizations providing collective goods need special arrangements or "selective incentives" to support themselves. The "closed" or "union" shop commonly used by most labor organizations is only the most conspicuous and best-known example of a wide array of special (and subtle) arrangements that account for most of the membership of large organizations providing collective goods.

It is because collective action is the essence of many serious problems in many different areas and disciplines that this book is relevant for readers with the most diverse interests. Sandler considers an extraordinarily wide array of problems that some readers might at first suppose were unrelated, but all of the problems share a common structure. To put it briefly and evocatively again, they all deal with the second law and why it does—or does not—apply. Every logical deduction and empirical finding in this book is a part of, or a test of, a single general theory.

Thus, when Sandler moves from the problems of ozone depletion, global warming, and acid rain, on the one hand, to the problems an oppressed population has in overthrowing an oppressive tyrant, on the other, it is *not*, in fact, changing the subject. On the contrary, it sticks single-mindedly to the premise that, often, "individual rationality is not sufficient for collective rationality." As this book shows, this problem and the paradoxical logic that explains it are evident, for example, when many different workers must combine their efforts in a single firm to obtain the economies of scale and scope, when farmers and fishermen overuse common lands and waters, when charity is needed to alleviate the poverty in a community, and when we do not all obtain the gains from using a common set of weights and measures.

It is not appropriate to go into the many intriguing subtleties and technical issues that are presented here. Such issues are analyzed in a rigorous yet usually also intuitively understandable way. When Sandler's discussion becomes, as on occasion it must, modestly technical, I found it all the more interesting. (Those readers who are not economists will find brief sections that explain the main specialized concepts and also directions around a few technical sections that can be skipped without sacrificing comprehension of the rest of the book.)

There is one fundamental issue that, even though apparently difficult enough that many highly regarded technical analyses get it wrong, can nonetheless be handled with the simplicity and brevity appropriate to a foreword. The domain of the first law, under which the hidden hand automatically generates collectively rational outcomes, is naturally a domain of the private

goods that analyses of markets have taken for granted since Adam Smith. With a sufficiently comprehensive definition of collective goods, the domain of the second law involves only such goods.

Now consider a small group of, say, two individuals who are in a situation in which the total cost of providing some amount of a collective good is definitely less than the aggregate value of the good to the two individuals, so that the collective good must be provided if there is to be group optimality. As we know, collective goods normally come under the second law, where the self-interest of the parties is *not* sufficient to obtain a collectively rational or group-optimal outcome.

But would it really be the second law, rather than the first, that applies when the group has only a few members? Would a sufficiently small group, even a group of only two members, be unable to obtain a collective good, even when the collective good was worth much more than it cost?

The conclusion usually drawn from the famous Prisoner's Dilemma model is that even groups of only two members normally fail to obtain a collective good. It is only when two individuals repeat the Prisoner's Dilemma game an indefinitely large number of times that they can achieve the gains from cooperation. In any single game (or in any set of games where the players know in advance how many games will be played), the dominant strategy for each player is to defect, and a collectively rational outcome will not be obtained. According to the Prisoner's Dilemma model, the number of individuals who would profit from the provision of a collective good does not affect the likelihood that it will be provided, since collective action will fail even for a group of two.

Why does the famous Prisoner's Dilemma metaphor illustrate the difficulties of obtaining the gains from social cooperation by focusing on outlaws concerned about the extent of their prison sentences? Obviously, societies work better when crime is deterred because criminals are likely to be punished. So why is the difficulty a pair of prisoners face in colluding on their alibi or strategy the standard game theory illustration of the barrier to mutually beneficial collective action generally? It is as though philosophers' only standard illustration of honor was honor among thieves.

I believe that the key to this strange situation is that the prisoners, already in the hands of the police and provably guilty of a lesser offense than the one with which the analysis is concerned, are purposely *isolated in separate cells* by the police, who have no other witnesses to the more serious crime. The prisoners are thereby denied communication with one another—and also the possibility of utilizing *any* of the manifold possibilities for making mutually advantageous deals that human ingenuity and social institutions normally supply.

Because the two prisoners are not allowed to communicate, they have no opportunity to make an agreement not to tell the authorities about their participation in the crime at issue and, therefore, no opportunity to serve their collective interest by making it impossible for the state to convict either of them of the more serious offense. Thus, a driving force in the two-person Prisoner's Dilemma is that an almost universal feature of any interaction of two individuals with a common problem—communication about how to obtain the outcome that is a collective good for both of them—is prevented by some exceptional circumstances: police officers who know that communication between the prisoners can stand in the way of inducing them to squeal on one another.

The hurried reader might object that the prohibition of communication does not matter, because the two individuals would still need to have a mutually credible agreement and this credibility may be lacking because of the difficulties of enforcing the deal. In fact, this objection does not alter the fact that the familiar two-person Prisoner's Dilemma applies only to wondrously special circumstances. Remember that, because their interest in evading punishment is itself illegal, the prisoners are, of course, also denied the device normally used for making mutually advantageous deals: a contract enforceable through the courts.

Thus, it is by no means an accident that it is criminals, of all people, who are used when there is an attempt to illustrate, with only two people, the difficulties societies face in obtaining social cooperation. In the overwhelming preponderance of cases with only two individuals, the dilemma blocking cooperation would simply not be there if the two parties were not criminals that the police keep from communicating with one another.

The *isolation* as well as absence of communication of the two prisoners is important in denying them a vast array of promising aids to credible agreements normally open even to criminals. They are, for example, denied the resource of using a third party acceptable to both of them as the arbitrator and enforcer of the deal, or the historically ancient device of each giving hostages to the other as assurance the deal is carried out. The array of arrangements that human ingenuity and communication can devise to make mutually advantageous deals credible is marvelously broad; I once heard of a movie in which two criminals insured the credibility of their illicit agreement by tearing a thousand dollar bill down the middle, so that it would be valueless until the parts were joined, with each of them keeping one of the halves until their agreement was fulfilled. But most enforcement mechanisms are incomparably simpler. The criminal who rats on agreements with his or her partner in crime also impairs his or her opportunities to obtain the gains from cooperation with others in future crimes—there are, after all, reasons why there is honor even among thieves. Finally, the ban on communication excludes the most familiar criminal device for enforcing agreements not to squeal to the police—the

threat, made credible by standard criminal practice, to torture and kill any partner who welches on a criminal agreement.

If any further evidence about the decisive importance of the special circumstance of denying communication and enforcing isolation is needed, it is provided by the result, so well known it is often now described as a "folk theorem," of an indefinitely repeated number of two-person Prisoner's Dilemma games. The result of such games, evident from the logic of game theory, from careful experiments, and from observation of the real world, is cooperation rather than defection: the two parties, through strategies such as tit for tat, ultimately obtain the joint maximization outcome that is a collective good to the two of them.

Though this is not made explicit in many accounts, the essence of the matter is that the special circumstances of isolation and the prohibition of communication are *inherently* impossible to maintain in an indefinitely long sequence of two-person Prisoner's Dilemma games. Each party, by proffering instances of cooperation and then rewarding reciprocal cooperation with continued cooperation and punishing defection by defection, can implicitly communicate with the other and the two of them can thereby tacitly agree to cooperate to obtain the collective good. The ultimate result of this communication and nonisolation for two parties is that mutually beneficial collective action occurs.

The foregoing does not, of course, mean that it is inappropriate to put, in the familiar two-by-two matrix, the numbers that bear the ordinal relationships needed for the Prisoner's Dilemma result. The Prisoner's Dilemma example has generated a lot of fascinating research. When there is a real-world situation where rational players are isolated and unable to communicate with each other, and the other factors affecting the costs and benefits of the collective good are also consistent with a Prisoner's Dilemma, rational individuals playing a one-shot game will, indeed, find that the dominant strategy is to defect and the collective good for the two individuals will not be obtained. There is obviously nothing wrong with the arithmetic of the standard presentation of the one-shot Prisoner's Dilemma game. Rather, the problem is finding any significant number of real-world situations that correspond to this arithmetic.

As I see the world, groups of two, and typically even small groups that have somewhat more than two members, usually are able, through voluntary rational action, to obtain the gains from social cooperation even when collective goods are involved. Unless communication and interaction are prohibited, the group with only two members certainly cannot be in equilibrium if it has not obtained a collective good that is worth more than it costs; if the group has not provided itself with such a good, it is always possible for the members of the group to find at least one allocation of the costs of obtaining the good that leaves both of them better off than they are without the good, so they have an incentive to continue bargaining and interacting and, thus, cannot be in equilibrium. As I see it, it is only in the strangest cases that the second law applies to very small groups; they are characteristically covered by the first law.

Let us now be as general as possible and consider situations that can involve any number of people and in which there is no prohibition against communication and interaction. These situations are, however, like the Prisoner's Dilemma in that they involve an outcome or collective good such that, if the parties cooperate to provide it, they can all be made better off, but in which no individual acting unilaterally in furtherance of his or her individual interests would find it advantageous to supply any of the collective good, or at least not the amount that group optimality (i.e., collective rationality) would entail. That is, there is the "externality" that is inherent in all collective good situations, in that each individual's provision of any amount of a collective good would confer some benefit to others. We have just seen that there is a large likelihood that two individuals who can communicate and interact in the presence of a collective good will act to obtain it and that they certainly cannot be in equilibrium if they do not, but instead have an incentive to continue to seek the mutual gains that they have not yet obtained.

Now suppose that the situation, while in other respects retaining the same structure as before, involves a collective good that would, if provided, benefit three individuals rather than two. The three individuals would still have an incentive to communicate and interact with one another to provide the mutually advantageous collective good, just as the two individuals in the previous example did (though it is now conceivable that the "game" would not have a "core"), and there is no basis whatever for any general presumption that three rational and self-interested individuals would not voluntarily provide themselves with the collective good.

The switch to a three-person situation nonetheless entails a change, one that can be seen most simply if we temporarily suppose that all of the individuals at issue were identical in tastes and incomes and examine unilateral or unstrategic (Nash-Cournot) behavior. With two identical individuals, any individual engaging in unilateral action to provide the collective good would, while bearing all of the costs of whatever amount of the collective good he or she provided, obtain half of the benefit of the collective good—the "externality" also would be one-half. But if we have three identical individuals, each individual still bears the full cost of whatever amount of the collective good he or she provides, but gets only one-third of the benefit. So unilateral or

Nash-Cournot behavior must, other things being equal, fall farther short, with three identical individuals rather than two, of obtaining a group-optimal supply.

If other things remain equal and we continue on to groups of four persons, or to groups with arbitrarily large numbers of beneficiaries of a collective good, the "externality" inevitably becomes relatively more important—an individual in the group, while still bearing the full cost of whatever he or she contributes to the provision of the collective good, obtains a smaller part of the gains from the action he or she undertakes, so that the unilateral behavior of an individual falls farther and farther short of providing the amount of the collective good that would be consistent with collective rationality. Indeed, as numbers become very large, an individual's share of the gains from action in the interest of his or her group becomes minuscule and the level of provision (if there is any provision at all) becomes utterly insignificant in relation to the amount that it is in the collective interest of the group to obtain. In other words, when the group becomes sufficiently "large," for all practical purposes it ceases (in the absence of "selective incentives" or institutional arrangements to overcome the problem) to act in its collective interest.

This is true even if we add individuals to a group that receives a given, perfectly nonrival public good—one such that additional consumers do not at all subtract from or congest the consumption of others—so that the collective benefit arising from any given level of provision of the public good increases proportionately with the number in the group while the costs of provision are not increased in the slightest. As the number who enter such a group gets larger, the group falls further from achieving the level of provision consistent with group optimality. That is, the extent to which individual rationality falls short of obtaining the amount of the collective good needed for collective rationality becomes ever greater as the group becomes larger. (However, as Martin McGuire and others have shown, and as Sandler lucidly explains in this book, if the collective good is a normal good, in the sense that individuals will, other things equal, purchase more of it when their incomes are higher, then, in the case considered in this paragraph, the absolute level of provision must increase with the number in the group.)

The argument that has just been made assumes unstrategic behavior and is for this reason (among many others, most of which are explained in this book) too simple to do full justice to groups with only a small number of members. That is, the foregoing argument about how, as the number who would benefit from the provision of a collective good increases, the group falls farther short of obtaining an optimal amount of a collective good, ignores the possibility that individuals will interact strategically; it ignores, most notably, the possibility that one individual will say to another that he or she will contribute to the provision of the collective good if the other does, but not otherwise, thereby increasing the second individual's incentive to contribute.

We now get to what is probably the most important point of all: in a sufficiently large or "latent" group of individuals with no single member who gets more than a minuscule share of the benefits of a collective good, the incentive for strategic interaction—and even the incentive to bargain with other potential beneficiaries of the collective good—disappears. If no two members, or no other small subset of the members of the group of potential beneficiaries of a collective good, would, in the aggregate, gain from bearing the costs of providing some amount of the collective good, then there is no incentive for individuals to interact strategically or even to bear the costs of communicating and bargaining with each other about how to remedy the lack of the collective good.

This implies that the statements occasionally made by casual students of these matters, to the effect that only "transaction costs" or bargaining costs prevent collective action, or the internalization of all externalities, from taking place, are wrong. What is sometimes casually called the Coase theorem is extremely valuable in many contexts and analyses of transaction costs in many settings also make great contributions to understanding. But they are not applicable to sufficiently "large" or "latent" groups that would benefit from the provision of a collective good. They have brought only confusion when applied to such situations.

We are now in a position to see why one-shot Prisoner's Dilemma games, in spite of their exceptionally restricted assumptions about isolation and prohibition of communication, became so famous. Most people know viscerally, from their experience and observation, that the second law often applies—that socially rational outcomes by no means always come about automatically. Pollution, overfishing, and the anarchic international system, among many other collective action problems involving large numbers, are all around us. The one-shot, two-person Prisoner's Dilemma is a marvelously simple metaphor and it predicts that socially undesirable outcomes will occur. Because this fits practical experience in many situations where large numbers of people are involved, the Prisoner's Dilemma is taken, incorrectly, as a general explanation of the difficulties of collective action.

Admittedly, as the author of *The Logic of Collective Action*, I could hardly be expected to be impartial about the conclusions in that book, including the conclusion that the number of individuals in a group was a most important determinant of the likelihood that collective action would occur. In part for that reason, I want, above all, to emphasize the appeal and value of Sandler's

emphasis on the point that reality is so complex that very simple general principles can almost never apply (without exception) to all cases. This point should be emphasized in using the theory in *The Logic of Collective Action* as in using any other model that claims broad explanatory power. It applies to all three of the main themes that Sandler so nicely abstracts from that book, including the theme that the size of a group is a major determinant of the likelihood of voluntary collective action.

As I have read this book, both where it involves the many totally new arguments that are offered, and also where it summarizes other work that has been done on collective action in the last quarter-century, I tend to see, in the remarkable variety of interesting and important cases considered, the underlying logical or theoretical unity of the diverse cases. But this is partly a function of my temperament and lack of detachment. There can be no question that, in any case of doubt, we should, until further analysis or evidence finally resolves the question, decide, with Todd Sandler, *against* the idea that a simple general principle adequately covers the whole range of cases.

This is a particularly important point to emphasize in a book of such remarkable richness and unity as this one. I learned a lot about many different subjects from reading this book. To some degree, this is due to prior gaps in my own thinking and reading. Even so, I do not see how capable economists or serious students of any of the several other fields that this book examines could fail to find that it brings into focus many important vistas that they had not seen before.

Preface

Collective action refers to activities that require the coordination of efforts by two or more individuals. As such, collective action involves group actions intended to further the interests or well-being of the members. Groups may be formal (e.g., a labor union or learned society) or informal (e.g., residents of a neighborhood). Whatever the nature of the group, a collective action problem arises when the actions of its members are interdependent: one person's reward (outcome) is dependent on the actions of others. To underscore the pervasiveness of collective action problems, consider the everyday act of driving a car on a two-lane highway with opposing traffic. A coordination problem requiring collective action arises every time two cars traveling in opposite directions approach one another. If both drivers coordinate and stay on their right-hand side of the road, then both will pass without mishap. In every country, collective action at the legislative or executive level has evolved a convention for which side of the road to drive on. Without these conventions, each vehicle must second guess oncoming traffic or else engage in a game of Chicken by driving in the middle of the road until one vehicle swerves. Collective action has also provided the road signs that warn, regulate, and inform drivers. Within the United States and throughout much of Europe, collective action has standardized road signs to facilitate interstate and international driving. The roadways' provision and maintenance are also the result of collective action at the county, state, or national level. Except for driveways, most people do not build and maintain their own roads. Snow removal, speed-limit enforcement, and some emergency services (e.g., ambulances) are also examples of collective action.

In some instances, collective action is voluntary, as in the case where the residents of a town pitch in to sandbag areas threatened by a rising river. In other instances, a government may have to provide the collective action, as in the case of highways and road signs. Whether collective action can be expected or not is a question of utmost importance.

In economics, the market is viewed as an impersonal mechanism to allow for the exchange of goods and services without the need for collective action. Individual pursuit of self-interest leads to the betterment of everyone when markets function perfectly. But the existence of a market economy