

Giving Advice on Social Dynamics

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Being involved with the Assembly of Behavioral and Social Sciences during the past five years has markedly increased my awareness of the difficulties faced by organizations that attempt to provide various governmental bodies with scientific advice on social problems. Much of that advice has to do with the interactions of social variables, what we call social dynamics. The first part of these remarks concerns some of the problems we encounter in attempting to answer apparently simple questions about social dynamics. Equally important is the invention of ways to deal with social problems when we perceive them. The second part of these remarks takes up some aspects of that problem, especially the fact that the social sciences are little called upon to provide advice in this area.

UNDERSTANDING THE NATURE OF CAUSES AND EFFECTS

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The first category of advice typically arises when we are asked to answer seemingly simple questions about social processes. As usually posed, such

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questions involve at least two social variables, call them X and Y , one of which we care about, say Y . The question is: Does X affect Y and, if so, in what degree?

- Does an increase in the amount or degree of violence in the TV fare of children increase violent behavior, perhaps some years following the exposure?
- Does a particular innovation in the teaching of high school physics result in adults who, on the average, have a better understanding of the role of physical science and technology in society?
- Does compensatory education in the early grades overcome some of the educational deficiencies apparently due to severe cultural deprivation during the first five years of life?
- Does the imposition of more severe criminal sanctions deter criminal behavior in others?
- What is the impact of various dietary practices during adolescence on health later in life?

Society repeatedly asks such questions of the behavioral and social sciences, as well as of the life sciences and medicine. All too often, we fail to come forth with an answer or, if we do, our answer is murky and hedged. My impression is that on the whole we are becoming more sophisticated in our approach to such questions, that we know better how limited is our ability to answer them, and that we are sometimes able to devise ingenious ways to arrive at answers. But progress is painfully slow.

There are at least four sources of difficulty in achieving answers. They are:

1. *Statistical models in lieu of causal models.* For the most part, we lack much, if not most, of the dynamic theory for the social processes about which we are trying to answer questions. For example, although there is an extensive literature on how various organisms learn, only a tiny fraction of that relates to the various methods of educating children—open classrooms, the timing and rate at which materials are introduced into the curriculum, repetition of materials, and the like. And within that fraction, there is considerable dispute about the effectiveness of these various methods.

Because of the lack of substantive theory, we attempt to study what

interests us by fitting models to the data by various statistical techniques. The mathematical form of these models can only be a crude approximation of the actual underlying relations; worse yet, we may well overlook variables of importance; and, at best, the statistical models provide uncertain extrapolations from past data. Even the most sophisticated of these, the econometric models of the economy, are limited in their ability to predict accurately the future course of the economy.*

2. *Observational rather than experimental data.* For the most part, we are unable to perform controlled experiments involving manipulation of important variables. Even when we can, the results may be suspect if the participants are aware that they are in an experiment and that special attention is being paid to them. Most often, we must settle for observing the naturally occurring variations in social relationships and attempt to explain resulting differences in behavior, somehow measured, by using statistical models. Between these two extremes—a perfectly controlled experiment, which hardly ever occurs outside of the laboratory (and often not there), and a natural occurrence—there is a region of partial experimental intervention that has come to be called quasi-experimentation. There is a small, but growing, literature on this.¹

3. *Long delays between cause and effect.* In many cases, there is a long delay, years or even decades, between an event or an exposure and its possible effects. Of the examples given earlier, only two—the relationship between television violence and violent behavior and the deterrent effect of criminal sanctions—can be studied in the short term; and, of course, the question of longer-term effects is also meaningful for these examples. The others—compensatory education, curricular innovation, and health effects—are all inherently long-delay questions. However, when more than a few weeks elapse between intervention and purported consequence, numerous uncontrolled events and experiences occur; and one becomes increasingly skeptical of any correlations that are found.

4. *Poor data base.* The data on which we depend for answers are often very poor in one or another respect. In many cases, they were not collected

*Perhaps it is well to make absolutely clear that I do not mean to identify causal models with deterministic ones, nor statistical models with stochastic ones. Almost certainly, satisfactory dynamic theories of social processes will be stochastic and not deterministic, but they are not likely to assume the form of the statistical models we normally invoke.

by the scientists who wish to use them; often they are not comparable from place to place or time to time; and sometimes they are subject to major political or economic influences and are suspect for that reason (e.g., federal crime statistics). There are, of course, many data banks whose virtues and limitations are well understood and whose quality is gradually being improved. Often, however, good sources of data do not exist for problems to which society seeks answers.

THE EFFECT OF PUNISHMENT

Perhaps a concrete illustration will make some of these problems more vivid. Do sanctions for crimes committed deter others from committing crimes? We are unlikely to perform any controlled experiments to manipulate the risk of sanctions, so analyses must be based on variations in crime rates and the application and degree of sanctions that occur over time and over jurisdictions. Moreover, since we do not have any detailed causal model for the social factors that inhibit or encourage criminal behavior, there is no choice but to approach the problem using some sort of statistical model. The general approach is to calculate the crime rate at various times and locations, calculate some measure of the risk of sanctions being applied, usually at the same times and locations, and then test for a negative effect of risk of sanctions on the crime rate within the context of a fitted statistical model. For example, does a greater risk of sanctions result in less crime?

The first problem is exactly which crime rates should be associated with which sanction rates. The measured sanction rates (as defined below) are used as surrogates for the criminal's perception of the risk of criminal activity. But is a perception formed on the basis of this week's sanctions (e.g., arrest), or last month's sanctions, or last year's? Further, how is this perception of risk in one part of a city related to the number of arrests in another part? Usually, the assumption is made that the risk is perceived in the same time period and in the same geographic areas in which sanction rates are measured; hence, crime rates and sanction rates are correlated without any time or spatial adjustments.

Now, let us examine three problems that may arise in drawing inferences from any naive examination of the regression of crime rate with risk of sanctions; that is, in estimating the effect of the second variable on the first.

1. *Spurious correlation because of poor data.* Suppose one uses the following measures of the two variables:

$$\text{crime rate} = \frac{\text{number of crimes}}{\text{population}}$$

$$\text{risk of sanction} = \frac{\text{number of times sanctions are imposed}}{\text{number of crimes}}$$

Note that if there is any variation in the rate at which actual crimes are reported to the police over jurisdictions, which is almost certainly the case, or over time, which also is likely to be the case, then this alone induces a negative association between the crime rate and the risk of sanctions; because the number of crimes appears in the numerator of the former measure and in the denominator of the latter one. Thus, poor crime data produce a negative correlation even if there is no deterrent effect whatsoever. Of course, one can estimate the magnitude of this artifact as a function of the quality of the data.

2. *Confounding of deterrent and incapacitative effects.* If we assume that an apprehended criminal has a higher probability of committing another crime than does a random member of the population, then incapacitating him or her will, with some probability, reduce the crime rate whether or not it deters others or (in the long run) even the incapacitated criminal. Of course, if one can estimate the chance that an apprehended criminal again commits a crime, which is very difficult to do, then one can estimate the magnitude of this artifact.

3. *Simultaneous effects of other variables.* A third artifact is that both variables, the number of crimes committed and the risk of sanctions, are also affected by the behavior of people other than the criminal. The number of crimes reported is a function of the number of crimes actually committed, those reported to the police, and those recorded by the police. The imposition of sanctions is a variable affected by, at least, the prosecutor, who has some discretion as to what is brought to the court, the jury, and the judge. Thus, any social factors that affect the behavior of any of these groups can change the relation between measured rate and risk. For example, if at some time a jurisdiction imposes fewer or lesser sanctions just because its crime rate is high and its criminal justice system is therefore overloaded, we will observe a negative correlation between rate and risk,

which has nothing whatsoever to do with deterrence. Again, by making further careful measurements and modeling these factors, one can estimate the magnitude of the effect.

CAPITAL PUNISHMENT AS DETERRENCE

The above discussion is drawn from a recent ABASS report.² One part of this report is concerned with the evidence concerning the deterrent effects of capital punishment on murder. A major study,³ analyzing data covering the years 1933–69, concluded that there is a deterrent effect of capital punishment. The Panel on Research on Deterrent and Incapacitative Effects of the Committee on Research on Law Enforcement and Criminal Justice conducted a careful reanalysis and raised many methodological questions that make one suspicious of the conclusions drawn from these data. Perhaps the most startling observation is this: During the period 1962–69, all crime rates (including murder, and also all sorts of noncapital crimes) rose; however, during that period capital punishment was not employed in the United States. Drop these seven years and reanalyze the remaining twenty-nine years, where the variation in crime rates and sanction applied is primarily over jurisdictions, and there is no discernible deterrent effect of capital punishment. The panel concluded from their analysis that existing data provide no useful evidence of the deterrent effect of capital punishment.

This example is reasonably typical of the difficulties encountered when we attempt to answer many seemingly simple social questions. Social scientists have no real alternative but to attempt to deal with such questions as best they can, and I am personally much encouraged by our growing body of well-trained, sophisticated researchers who are sensitive to the pitfalls. But, equally, by the nature of our limited understanding of social processes, it is not always possible to provide simple, clear-cut answers in our reports.

DESIGNING INSTITUTIONS TO ALTER SOCIAL PROCESSES

Why does society want answers to questions about social processes? It is rarely, if ever, out of intellectual curiosity alone that a question is posed; it is rather because we wish to solve or modify a perceived social problem. We

want less violence in our society, better-informed citizens, equal educational opportunity despite early cultural deprivation, reduced national health problems such as heart disease, and so on. Put another way, society is interested in understanding social processes primarily because such understanding may suggest interventions to ameliorate a perceived problem.

Assuming that the evidence is adequate for thinking X affects Y in a particular direction, that we indeed know the effect, for example, of a higher risk of punishment on crime rates, then the next question is the nature of the interventions to be imposed on X itself or on relationships between X and Y so as to achieve a desired change in Y . At this point, a number of options are available and an elaborate political process selects or devises the particular intervention to be tried. The choice of the intervention and the crafting of the institutional structure for intervening is largely in the hands of those in high- and middle-level government positions. These groups often seem confident that they understand how to create institutions to do particular jobs. Some of us, however, are less confident, our doubts being based on the repeated failures of interventions to work as intended.

It has become increasingly clear that the success of new programs rests as much on the structure and functioning of the institutions charged with their implementation as it does on the soundness of the program concepts. In practice, there has been a very wide variation in the efficiency and effectiveness of interventions. Increasingly, since World War II, and perhaps a good deal earlier, it has become obvious that the task of designing institutions to implement programs or of modifying existing ones to accommodate new goals or strategies is exceedingly complex and subtle.

Although there is research scattered among the behavioral and social sciences on the issues involved in institutional design and change, it is fragmented and has had relatively little impact on those who design new institutions or on those in the field who implement the new programs. We find ourselves in an odd position: Government increasingly recognizes that understanding exactly how social processes work is usually quite difficult and that little of a common sense, *a priori* nature is valid; but it has less fully recognized that we also rarely understand how to intervene effectively. Thus, to change the relation between two social variables in some desired ways, we create an institution to affect a process we only dimly understand,

using methods whose effectiveness is unclear. There is little reason to expect common sense to be much better here than it was in understanding the source of the original problem.

To be sure, what social scientists know about the design of interventions is limited, but I do not believe that this knowledge has been as successfully marshalled as have been our methods to develop knowledge about social processes. Of course, the latter techniques can and are being used to evaluate the effectiveness of different social “experiments.” In addition, however, ABASS and other advisory organizations should devote considerably more of their effort to inventing intervention schemes, to predicting the consequences of proposed techniques of intervention, and to attempting to codify the known methods and their apparent successes.

Let me list some of the issues to which I hope we will turn our attention in the coming years:

1. *What are the goals of the intervention?* As we all know, the processes by which legislation is drafted, amended, and passed, and out of which agencies are created or given specific responsibilities, are complex and political. More often than not, several partially conflicting goals are embodied in the same legislation; and only rarely are these goals sufficiently specific to provide explicit guidance. The result is that the ultimate goals of the institution responsible for the intervention often evolve gradually over time, through political interactions between the institution and various elements of the society. We understand this process only dimly, but it is clearly a very important aspect of the evolution of a bureaucracy and very important in the success or failure of an attempted intervention. We need to study carefully the dynamics of evolving institutions, particularly their childhood and adolescence, the time when they develop their values and style.

2. *What are the possible strategies of intervention?* It is not difficult to catalogue some of the more commonly employed methods of intervention:

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- Creating a regulatory agency, with various interventionist powers, including information transmission, setting of standards, enforcement of standards, effluent charges, sale of pollution rights, prohibition, and licensing and setting of fees.

- Creation of legal rights, including well-specified avenues of access to courts.

- Subsidization of specific groups, firms, or industries handled by specified agencies.
- Government-owned firms to produce specific products.
- Nationalization of particular industries.
- Government-financed services, such as the Veterans Administration, Medicare, Social Security.
- Tax policies.

Often there is little consensus about the type of intervention that should be adopted to achieve a particular set of goals. We are currently in the throes of just this problem vis-à-vis reduction of energy consumption. To take one explicit example: What techniques should be adopted in order to reduce the number of “gas guzzlers” on the road? Prohibit them, tax them, subsidize alternatives, try to create psychological pressure against them, or what? Aside from the political problem of attempting to select a balance between freedom of choice and long-range social goals, there is the fact that decision makers really do not have a very clear idea of what the consequences will be from the various strategies available to them.

I do not wish to suggest that social scientists know either—but I do think that it might prove useful to try to assemble what we know historically about various attempts to intervene and their results. The history of such attempts in our culture and in others is long and complex, and it is conceivable that some generalizations are either available or can be generated.

3. *Crash programs of research.* Our great engineering successes—the Manhattan project, Apollo, and many less spectacular ones, such as the design and construction of a modern weapons system or a large jet transport—are often held out as models of the type of organization needed to solve complex social problems. It is held that complex systems—be they the social network sustaining drug addiction, the failing structure of the inner city, the system of organized crime—are just that: complex systems. And as such, they should be susceptible to the finely developed systems techniques of the engineers and physical scientists.

Most social scientists fear that this approach, however good it may be for complex engineering problems, is doomed to failure when applied to social problems. The reason is not the great complexity of the social system, for by any reasonable count the inner city has no more components than a complex aircraft, but it is our very incomplete understanding of the



variables and the constraints on them—the dynamics of the process. Imagine the creation in 1700 of the equivalent of a \$100-million, 10,000-person project to design a flying machine using the technology and physics of the day.

We suspect that it is more useful to be more modest. It is enough to try to systematize experience, to perform quasi-experiments, and to be happy when we induce a change of trajectory toward the desired direction.

4. *Pathologies of bureaucracies.* It is all too well known that the observed behaviors of institutions are often irrelevant to, if not in direct opposition to, their formal goals. One suspects that this tends to arise not out of perversity as much as from some sort of built-in or evolved structure of rewards for individuals within the bureaucracy. The phenomenon is so widespread that society cannot but ask itself in each case whether the pathologies that arise are such that it is better to live with the problem than it is to incur the long-range costs of the intervention; that the “solution” may be worse than the problem. At the very least, the information generated by such bureaucracies about the problems with which they are to deal, the impact they have had on them, and the nature of their own workings is most suspect.

I do not know how much knowledge there is about the malfunctioning of different types of institutions, but I am certain that it has not been properly marshalled for Congress and the executive branch.

Since I feel as I do about the importance of applying the knowledge of social science to the problems of social intervention, why has this not been a major fraction of ABASS activity? There are at least two reasons. First, there probably is not a large group of social scientists with the requisite interest and knowledge to bring adequate pressure on ABASS to go in this direction. Second, and I suspect somewhat more important, there does not seem to be a natural constituency willing to pay for such advice. Existing bureaucracies are not really very interested in being told they are not appropriate to their task or that they are carrying it out badly. We have tried, for example, to mount a committee to study the regulatory process in government, but we found no agency in the executive willing to fund it. The most natural constituency is Congress, but to date it has not provided itself with mechanisms for soliciting long-term advice of the sort I am suggesting it often needs. Although I think it would be foolhardy for the social sciences to offer any serious promises in this area, it might be possible to see whether there is enough knowledge and wisdom about the performance of institutions to improve somewhat on their design.

ASSEMBLY OF BEHAVIORAL AND SOCIAL SCIENCES

SUMMARY

There are two major types of advice an organization such as ABASS can try to give. The one that has preoccupied most of our effort over the past few years is on the nature of certain dynamic social processes. The major reason for gaining some understanding is to uncover potential sites for intervention in order to affect some social variable. I tried to outline in some detail the nature of the problems we have in studying such processes and why, so often, our answers are less than clear-cut. The other type of advice, for which we are little asked, concerns the design of institutions to effect the intervention. I tried to indicate both why this is at least as problematical as the questions we are asked, and why, as yet, we find it difficult to gain support for this work.

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