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Social Indicators

Social science researchers are developing concepts and measures of changes in society.

Eleanor Bernert Sheldon and Robert Parke

A statistical report entitled *Social Indicators, 1973* was published last year by the U.S. Office of Management and Budget (*1*). *Social Indicators* contains charts and tables presenting statistical time series selected and organized around eight "social concerns," namely, health, public safety, education, employment, income, housing, leisure and recreation, and population. The report is the first of its kind to be issued by the U.S. government. Its publication is symptomatic of the widespread interest in social indicators.

This interest is further reflected in a social indicators bibliography that was published in late 1972 (*2*). More than half of the 1000 or more items listed in the bibliography were issued in 1970, 1971, and 1972. Government agencies both in the United States and abroad (*3*), as well as private scholars and research institutes, are concerning themselves with social indicators, as are international organizations such as the Conference of European Statisticians (*4*), the Organization for Economic Cooperation and Development (*5*), the United Nations Research Institute for Social Development (*6*), the United Nations Educational, Scientific and Cultural Organization (*7*), and the United Nations Food and Agriculture Organization (*8*).

"Social indicators," and allied phrases, "social accounting," "social reporting," and "monitoring social change" came into use by social scientists, commentators, and policy-makers in the mid-1960's. These phrases and the ideas they represented emerged from an awareness of rapid social change, from a sense of emerging problems with origins deep in the social structure, and from the ambience of the early Johnson Administration which encompassed a commitment to the idea that the benefits and costs of domestic social programs are subject to measurement and to the belief that each newly perceived, albeit ancient, inadequacy in the society should, and would, call forth a corrective response from a federal government whose efficacy would be assisted by social measurement, planning, and new management analytical techniques. Impetus was provided by a handful of social scientists and public administrators. The enthusiasm elicited responses from economists who saw a role for their skills as theorists and measurers of welfare, sociologists who saw the relevance of their own research tradition in the measurement of social trends, political scientists who sought ways to rationalize government programs, social workers, public administrators, and a broad array of social researchers and practitioners. Out of this emerged what came to be known as the "social indicators movement," an apt designation in that, as in all movements in their initial stages, the participants were ill-defined as to membership, had little organization, and shared few specific objectives, but sensed great needs and opportunities for change, celebrated shared but necessarily ambiguous symbols, and were led by able and articulate idealists.

From the ambiguity of the early discussions several distinguishable types of research activities have emerged.

Social indicators. Conceptual, method-

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ological, and data-development work is being conducted for the purpose of providing statistical time series which measure changes taking place in the society. The emphasis is on measuring and reporting changes in such varied areas as social mobility, subjective sense of well-being, tolerance of dissent, and many others; and on developing analytical models which account for the observed changes.

Evaluation research and social experimentation. Disappointment with the results of recent domestic social programs has directed attention to the need for a more scientific approach to program testing and evaluation, as illustrated by the New Jersey Income Maintenance experiment (*9*), the current Housing Allowance experiments (*10*), and the evaluation of the Head Start program (*11*). Although references to program evaluation were abundant in the early discussions of social indicators, there seems increasingly to be concurrence with a view which distinguishes the descriptive and analytical statistical time series needed to monitor and analyze social change from the experimental designs by which government programs may be evaluated (*12*).

Net national welfare measurement. Economists in the United States and Japan have experimented with adjustments to the national economic accounts, especially gross national product (GNP), to improve their adequacy as measures of welfare (*13*). For example, Nordhaus and Tobin have incorporated nonmarket activities such as the costs of pollution and the benefits of leisure (*14*). Others in the National Bureau of Economic Research have undertaken major modifications in the accounts to improve their usefulness as measures of economic activity and economic welfare (*15*).

National goals accounting. This encompasses efforts to give explicit definition to national goals and priorities and to measure the costs of achieving them. Terleckyj, of the National Planning Association, employs indicators of social conditions, estimates of potential program effectiveness, and estimates of discretionary resources, public and private, in order to estimate the possibilities for planned improvement in the quality of life in the United States (*16*).

Recent Origins

Although work on social indicators has its intellectual origins in research on social trends dating from the 1920's and 1930's (*17*), use of the term "social indicators" became widespread following publication of a book by that title in 1966, edited by Bauer (*18*). Seeking initially to find ways to assess the social impacts of the space program, Bauer brought together several prominent social scientists whose work came to be focused on broader questions of social measurements and their use in assessing the state of society relative to national goals.

A chapter by Biderman showed that, of 82 goals set forth in the 1960 report of the President's Commission on National Goals, pertinent statistical indicators were available for only 48 of them. Inadequacies of the measures available in one specific field were set forth in Biderman's authoritative critique of U.S. crime statistics. Another influential essay in the Bauer book was one by Gross on "Social systems accounting" that called for the development of comprehensive models describing the structure and performance of entire social systems. An arresting phrase from Gross's preface to the book was contained in his attack on the "new Philistinism" that is encouraged by the relative ease with which quantities expressible in dollars are measured and communicated, and consequently accorded an exaggerated importance in the scheme of things.

Also in 1966, the President's Commission on Technology, Automation, and Economic Progress called for the development of a system of social accounts that "would give us a more balanced reckoning of the meaning of social and economic progress, that would enable us to record not only the gains of social and economic change but the costs as well . . . ," and eventually might provide a "balance sheet" for use in clarifying policy choices (*19*). The analogy to the national economic accounts and their role in the policy process was drawn further in a bill, "The Full Opportunity and Social Accounting Act," introduced in 1967 by Senator Walter F. Mondale. The bill, which proposes a council of social advisers and an annual social report from the President to Congress has been reintroduced several times, most recently in 1973 (*20*).

These early documents asserted a need to utilize and develop statistics to measure the social state of the nation with respect to a broad range of consensus values, or sometimes more narrowly, national goals. Associated with this were expressions of need for measures of noneconomic dimensions of well-being approaching the power of available economic statistics. Underlying these expressions was a commitment to the idea that better social information would improve public policy. These ideas were elaborated in 1967 in two volumes of the *Annals of the American Academy of Political and Social Science* (*21*).

Toward a Social Report

An influential statement of the need for social indicators was presented in *Toward a Social Report* (*22*). This document, issued by the Department of Health, Education, and Welfare (HEW) in 1969 on the last day of the Johnson Administration, was developed under the supervision of Assistant Secretary William Gorham and his successor, Alice Rivlin, who cochaired, with Daniel Bell, HEW's Panel on Social Indicators. Avowedly not a social report, but a step in that direction, the volume was presented as "an attempt on the part of social scientists, to look at several important areas and digest what is known about progress toward generally accepted goals." The areas treated were health, social mobility, the condition of the physical environment, income and poverty, public order and safety, and learning, science, and art. It was an "attempt" because, the report said, the government does not produce most of the figures needed. For example, "We have measures of death and illness, but no measures of physical vigor or mental health. We have measures of the level and distribution of income, but no measures of the satisfaction that income brings. . . . We have some clues about the test performance of children, but no information about their creativity or attitude toward intellectual endeavor."

In outlining the need for social indicators for future reports, *Toward a Social Report* laid stress on highly aggregated statistics that would permit "concise, comprehensive, and balanced judgments about the condition of major aspects of society." It also stressed the need for "direct measures of welfare," in the economist's sense of the term, and contrasted this sort of measure with statistics on governmental inputs to the society. "Thus statistics on the number of doctors or policemen could not be social indicators, whereas figures on health or crime rates could be."

The report's principal expositor is its principal author, Mancur Olson, who served HEW as deputy assistant secretary for social indicators and has continued to pursue and develop the interests and ideas expressed in *Toward a Social Report.* The analogy and contrast with the national economic accounts is prominent in Olson's writing about the purpose of the report: ". . . for all their virtues, the national income statistics don't tell us what we need to know about the condition of American society. They leave out most of the things that make life worth living," for example, how much children learn, the compatibility of families, the advance of science, and democratic liberties (*23*).

A Tradition of Measurement

The prominence of economists in the social indicators movement, and the fact that they saw the task as one of finding nonmarket measures of well-being, encouraged an emphasis on "noneconomic" components of the quality of life and a vision of social indicators as measures of these components. The influence of economists was also responsible for the dominance of the imagery of the national economic accounts in discussions about social indicators. Both these ideas have served as rallying points for people in the social indicators movement. However, these ideas have provided an unproductive conceptual basis for the scientific work that is required for follow-through.

A key problem is that the term "social" has been used in a residual sense to mean "outside the realm of economics." For example, Olson says: "The most notable limitation of the national income statistics is that they do not properly measure those 'external' costs and benefits that are not fully reflected in market prices." This is true enough, but the trouble begins when this approach to delineating the area of concern comes to define the realm of social indicators, as it does: "Ideally, what the national income statistics leave out, social indicators ought to measure, and a social report ought to assess" (*23*).

The implied homogeneity of the residual, of the "social" in this use of the term, does not exist. To suppose that it does is to guarantee confusion. And to suppose that the residual topics may in principle be represented by analogy to national income is to compound confusion. Both points were well made by Leroy Stone (*24*).

> I have found that most people who use "social" in this sense [of noneconomic] fail to realize what a wide net they are casting, and how tremendously varied are the fish that that net will snag. . . . We may think of social organization as being comprised partly by a network of interrelated and open subsystems. One of these subsystems is concerned with the production and distribution of wealth—we call it the economy. Examples of other subsystems are [the educational system and the system for acquisition and distribution of political power]. . . .
>
> The implied analogy to economic indicators development is actually useless; because nowhere in economic theory, as I understand it, are we faced with the problem of integrating information about such a wide variety of subsystems that are not demonstrably oriented toward any conceivable common goal that can be as fairly concretely identified as aggregate income.

The tendency to define the realm of the "social" as a residual and what many regarded as an excessively aggregative approach to indicator development were challenged by scholars who called for the resumption of detailed work to improve measures of change in various sectors of the society. The subject of measures of changes in social conditions had been discussed in one essay (Biderman's) in the Bauer book (*18*) and in a few of the papers in the *Annals* (*21*). An 800-page volume entitled *Indicators of Social Change: Concepts and Measurement* was published in 1968 by the Russell Sage Foundation (*25*). This volume, and other works (*26*), contained detailed reviews of conceptual and measurement problems in the delineation of demographic, social structural, and other types of change in the United States. The data dealt with in these publications were of the "hard" variety, and in 1972 *The Human Meaning of Social Change* was published, dealing with conceptual and measurement problems involving subjective data on public aspirations, expectations, and satisfactions (*27*).

The scientific tradition from which such work emerged has its origins in the work of the late William F. Ogburn. Best known for his "cultural lag" theorem of the relationship between technological and institutional change, Ogburn was fascinated by social change and committed to the application of social science to the elucidation of social trends and, ultimately, thereby, to the guidance of social planning. He served as research director of President Hoover's Research Committee on Social Trends, which in 1933 published the monumental *Recent Social Trends* (*28*). Ogburn's view of the significance of research on social trends was set forth in an essay published in 1929 (*29*):

> . . . there is a continuity in cultural change; one event grows out of another . . . the knowledge of what has occurred and of what is happening is the safest guide we have. With more complete statistics and with better measurement we shall attain fuller knowledge of what is happening to us and where we are going. Only with these shall we be in a position even to begin to speak of control.

Duncan, who has edited Ogburn's papers, gave the essential point a contemporary statement in a comment on the scope, content, and purpose of social indicators (*30*):

> What we must have, minimally, are quantitative statements about social conditions and social processes, repeatedly available through time, the reliability and validity of which are competently assessed and meet minimal standards. If such statements—"social measurements"—can be organized into accounts . . . so much the better. If some combination of measurements or quantities derived from elementary magnitudes can be shown to serve a clear interpretive purpose as "indicators," so much the better. As accounting schemes, models of social processes, and indicators are developed and tested, our idea of what to measure will, of course, change. But that does not alter the principle that the basic ingredients are the measurements themselves. We are talking about information, the processing of information, and the reporting of processed information.

In other words, a prerequisite to the advancement of social indicators, however defined, is the scientific measurement of social change. Duncan's statement was a call to the measurers among social scientists to get on with their part of the job.

The Uses of Social Indicators

There are many social scientists engaged in work on social indicators whose essential commitment is to the analysis and measurement of social change (*31*). However, most of the enthusiasm about social indicators has been and is predicated on their ultimate usefulness for guiding social policy. The issue is the sense of the term "useful."

One view sees social indicators as providing a basis for the evaluation of government programs. However, the development of evaluation research, particularly social experimentation, as a distinct type of social research has attenuated the expectation that social indicators are to serve the purpose of program evaluation. There is increasing agreement that program evaluation requires the evaluator to demonstrate that government programs, not uncontrolled extraneous variables, determine the outcomes measured by indicators, and increasing recognition that, from a scientific point of view, the most satisfactory way to demonstrate this is to incorporate experimental designs into the testing of government programs (*32*).

Much of the interest in indicators has arisen out of concern over social problems such as poverty, racial unrest, drugs, crime, demonstrations, the "urban crisis" and the like (*33*). Accordingly, another view of the role of social indicators is to contribute to problem-solving through their application in goal-oriented analyses (*34*), of the kind developed in economics and operations research. The flaw in this definition is that it tends to limit their scope to matters covered by the authority, competence, and objectives of administrators. No one will deny the importance of such matters. But this is no justification for our letting the agenda of work on social indicators be governed by the perceived information requirements imposed by a social engineering approach or letting it be limited to "policy-manipulable" variables—that is, those subject to the control of the agencies responsible. This is recog-

nized by Biderman in his differentiation of the several levels of social information (*35*). The summary is by Henriot (*36*):

> . . . Biderman notes that there are three distinct uses of data which should not be confused mentally or organizationally. The lowest or most specific level of data is "information"—data intended for use at the operational level. The next level of data is that designed for overall administration and management purposes, and is "intelligence." The third and highest level of data is termed "enlightenment," and is designed for contributing to public understanding and formation of general policy. It is this third category which Biderman would designate as "social indicators."

In social engineering, one starts with an agency objective, and the information on social behavior and social conditions is limited to what is deemed relevant and appropriate, given an agency's authority, traditions, and the tools available. By contrast, a social scientific approach to indicators, in our view, starts with social behavior, and seeks to comprehend and measure it and to account for changes in it. Adequate description, measurement, and explanation serve the needs of science and also provide the "enlightenment" function to guide policy.

To comprehend what the main features of the society are, how they interrelate, and how these features and their relationships change is, in our view, the chief purpose of work on social indicators. This is a realistic, albeit a major task, and a long-term one. There are several aspects to it. Work to improve the data base for social indicators may be illustrated by recently instituted surveys which develop new data on crime and on learning, and by the replication of questions asked in prior surveys, to provide data for trend analysis. Conceptual and methodological work may be illustrated by recent developments in the measurement of racial prejudice and the subjective assessment of the quality of life, and by work on models of social processes. In addition, there is important activity at the local and community level, which we shall not attempt to cover here (*37*).

Improving the Data Base

Questions such as the following are being asked each month in 10,000 households and 2,500 businesses around the United States:

During the last 6 months, did anyone break into or somehow illegally get into your home, garage, or another building on your property?

Did anyone beat you up, attack you or hit you with something, such as a rock or bottle?

Such questions are part of the National Crime Survey being conducted by the Bureau of the Census on behalf of the Law Enforcement Assistance Administration (LEAA) of the Department of Justice. This program of nationwide crime victimization surveys is designed to "regularly provide statistical data on the incidence of common crime, its cost, the characteristics of victims, and the characteristics of criminal events."

Figures on crimes reported to the police have been and will continue to be provided from official police statistics released by the Federal Bureau of Investigation (FBI) in the *Uniform Crime Reports* (UCR). But many crimes are not reported to the police, the percentage of unreported crime varies widely for different types of crime, and police recording procedures are not always "uniform," despite the FBI's attempts to make them so. Since the survey questionnaires were designed so that crimes could be classified in accordance with the categories used in the UCR, the National Crime Survey will provide estimates of the amount of crime that goes unreported. It will also provide an assessment of citizen reasons for failing to report crimes to the police.

The LEAA views the basic survey as an omnibus collection vehicle to which supplements can be added as needed. One such supplement is an attitude questionnaire which attempts to tap subjective evaluations of the seriousness of crime problems, and the impact of perceptions about crime as a factor affecting behavior patterns such as choice of neighborhood, selection of shopping and entertainment facilities, and frequency of going out at night.

For years we have had abundant data on school attendance, school years completed, teacher-pupil ratios, numbers of schoolrooms, and the bonded indebtedness of school districts, but who knew how much the children were learning?

Now we have the National Assessment of Educational Progress, designed as a periodic "national survey of the knowledge, skills, understandings and attitudes of certain groups of young Americans" in ten subject areas (*38*). Each year, a series of written and performance exercises in two subject areas are administered to in-school probability samples of 9-, 13-, and 17-year olds and to household probability samples of young adults of ages 26 to 35 years and 17-year-old early graduates or dropouts. Approximately 80,000 to 100,000 young people participate each year. Published and projected reports cover the areas of science, writing, and citizenship, reading and literature, music, social studies, mathematics, career and occupational development, and art. The United States is also included in an independent multination program to develop internationally comparable measures of learning (*39*).

New data sources such as these promise far better measures of social conditions than we have had heretofore. However, they can tell us nothing about what happened in the past. To develop information on past changes, several investigators have adopted a strategy that Duncan has called the "replication of baseline studies" (*40*). The premise for this strategy is that there exists in social science a number of important studies which bear repeating and which are documented well enough to permit contemporary investigators to duplicate the measurement methods of the original study.

Duncan's own work in recent years has exemplified this approach. For example, in 1971, at his instance, the Detroit Area Study re-asked a number of questions originally asked in the 1950's. The results, recently published, provide data on changes in the Detroit area with respect to the division of responsibility within families, changing racial attitudes both of whites and of blacks, changes in the religious participation of the population, and changes in social participation (*41*).

Replication is the strategy of the General Social Survey at the University of Chicago's National Opinion Research Center (*42*). Annual surveys are being conducted, in which the questions are selected from questions asked in surveys extending back to the early 1950's. The survey results—covering such topics as political preference, religious preference, job satisfaction, fear of crime, attitudes toward civil liberties, and race relations—are being made available on punch cards at nominal cost in order to ensure the widest possible participation in the analysis of the trends they describe.

The most notable example of the replication strategy is the 1973 replication of the 1962 Survey of Occupational Changes in a Generation (*43*). This work, being done by Hauser and Featherman, who are utilizing the survey resources of the Census Bureau, will provide comprehensive trend data on the degree of inequality of opportunity in the United States and the changing importance of ethnicity, family background, education, and other factors in occupational advancement.

The survey archives of the Inter-University Consortium for Political Research, located at the University of Michigan, have long been used for the analysis of trends in political participation and attitudes. Other aspects of social change will be opened to

analysis as the result of a project to analyze National Opinion Research Center surveys covering the past quarter century, and a Russell Sage Foundation–supported project to exploit the time-series potential of the surveys archived by the Roper Public Opinion Research Center (*44*).

The replication strategy has substantial advantages in that it produces time series of substantial length without it being necessary to wait for years to pass, and it exploits data resources already in existence. However, it is limited to topics contained in those resources. Consequently, several efforts have been undertaken to develop measurement techniques, suitable for repetition in the future, on topics for which measures are now either inadequate or nonexistent.

Developing Concepts and Measures

Racial prejudice. Research at Berkeley, on the development of model social indicators, includes the development and validation of measures suitable for monitoring and analyzing change in racial prejudice, as well as political alienation and women's roles (*45*). The investigators, like several other scholars, doubt that the harboring of negative racial stereotypes is an adequate index of prejudice. The preliminary research, conducted by Glock and Ofshe with the aid of lengthy and thorough interviewing, has differentiated three cognitive components of prejudice: perception (stereotypes); explanation, that is, the modes by which people explain racial differences (God, genetic differences, ambition, suppression by the majority, and impersonal social processes); and prescription, that is, the ameliorative actions people say they would support. The chief aim has been to determine whether survey respondents can articulate an explanation of the group differences they perceive, and to relate these explanations to the perceptual and prescriptive components of the responses. The findings indicate that people can articulate explanations and that their explanations predict what types of ameliorative action they would sanction far better than do their perceptual responses. Additional research will include testing a battery of survey questions to select the best basis for indicators of prejudice. Once completed, the project should yield a major advance in our ability to define as well as to measure and account for change in racial prejudice.

Subjective well-being. Following on the work on subjective measures of the quality of life pioneered by Campbell and Converse (*46*), Andrews and Withey of the Institute for Social Research, University of Michigan, report that they have developed "a rational empirical basis for measuring perceived quality of life" (*47*). The basis for their claim is their analysis of survey data on responses (ranging from "delighted" to "terrible") to 123 questions like, "How do you feel about: the things you and your family do together . . . your job . . . the schools in this area . . . your safety . . . ," and so forth. By cluster analysis, they reduced the 123 items to indices of 12 "life domains," and found that these 12 accounted for 50 to 60 percent of the variance in responses to general inquiries about life satisfactions.

The Andrews-Withey research is one of many projects that were reported in 1972 at the Conference on Subjective Measures of the Quality of Life convened by the Institute for Social Research (*48*). In their keynote paper for that conference, Campbell, Converse, and Rodgers said, ". . . quality of life is a function not only of the objective characteristics of a person's situation but also of his expectations and aspirations. It is because of this assumption that measures of material welfare are deemed inadequate unless supplemented by subjective measures of life quality; satisfaction might be found to decrease even as per capita GNP is rising." In addition to general surveys of life satisfactions, research was reported specifically with reference to the relationships of subjective well-being to work and to local government services, and many other topics.

Social Systems Models

A number of investigators are working on models of various aspects of change. Indeed, one of the most widely cited definitions of social indicators place them in the context of social system models. Land wrote in 1971: "I propose that the term *social indicators* refer to social statistics that . . . are components in a social system model (including sociopsychological, economic, demographic, and ecological) or of some particular segment or process thereof. . . . The important point is that the criterion for classifying a social statistic as an indicator is its *informative value* which derives from its empirically verified nexus in a conceptualization of a social process" (*49*).

Work on indicators of this sort includes simple models of social and demographic processes, path-analytic models of occupational mobility (*50*), the application of econometric analytical techniques to social and demographic time series for the entire United States (*51*), and models of the processes of social and economic development of developing nations (*52*).

Demography has been especially productive of simple models of social processes; for example, the life table, Coale's model of age patterns of marriage (*53*), the work of one of Coale's students on age patterns of childbearing (*54*), and the work of Land, a mathematical sociologist, on the divorce trajectories of marriage cohorts (*55*). The success of such efforts in capturing in a few parameters the essential information contained in masses of census data and vital statistics, suggests that a search for new opportunities for applying the techniques of demography and mathematical sociology may substantially increase the number of subjects on which we are able to convey information compactly, with minimum loss of detail, and thus enhance our ability to develop explanatory models and projections and to define indicators with the properties specified by Land.

The papers published in *Social Indicator Models* (*56*) give an indication of the work being done, and of the more elaborate modeling efforts.

Social and demographic accounts. Closely related to some of the above modeling work is developmental work on designs for large systems of social and demographic accounts. Work of this character is being done under the auspices of the United Nations Statistical Office and the Conference of European Statisticians by Stone, at Cambridge University (*4*, *57*). Stone's work represents an application of input-output analysis to the description of the processes by which people move into and out of various significant social states as well as into and out of the population. In the case of demographic accounts, the inputs and outputs are numbers of people. The basic notion is expressed in the demographic accounting statement that the population at the end of the year equals the population at the beginning of the year, plus births, minus deaths, plus migrants in, minus migrants out. What Stone does is to generalize the concept in order to provide a statement of movement into and out of subpopulations as defined by occupancy of significant social states.

In the current state of this work, Stone, using official statistics for England and Wales, has developed statements of the processes by which the population moves through time, through ages of life, through school, and through working life. The principal types of numbers available from such an accounting scheme are statements of the stock of the population with respect to all of these attributes at any one time, and

statements of the flow of the population through these various categories in any one period.

The scheme lends itself to the development of sets of transition ratios between successive combinations of states; to various studies including projection of the population with reference to the various statuses of interest; and to examination of the different impacts on educational outcome associated with demographic changes as distinguished from changes in the structure as represented by the transition probabilities. The scheme is, in principle, extensible to descriptions of the stock of the population and its flow between states with respect to income, marital status, and family status, location, and even social class. It is designed to yield a number of measures of system states.

Taking Stone's work as a point of departure Coleman has been employing it as a basis for hypothetical experiments on the effects of social processes on the achievement of occupational status by blacks (*58*). At Statistics Canada, work is proceeding on the design of a modular, integrated System of Social and Demographic Statistics. The design of this system seems to have a number of features in common with Stone's. However, the Canadian system is modular, which may avoid some of the problems of manageability associated with the size of the matrices implied in Stone's work (*59*).

Conclusion

The notions of social indicators and social accounting, expressed by analogy with the national economic accounts, generated excitement in the 1960's, and the interest continues to grow if we may judge from governmental activity and the publication of programmatic and research papers. But the concepts which focused much of the early enthusiasm gave exaggerated promise of policy applications and provided an unproductive basis for research. The essential theoretical prerequisites for developing a system of social accounts—defining the variables and the interrelationships among them—are missing. It is now realized that evaluation research, particularly experimentation, must be relied on for evaluation of government programs. Through the development and analysis of descriptive time series and the modeling of social processes, we will be able to describe the state of the society and its dynamics and thus improve immensely our ability to state problems in a productive fashion, obtain clues as to promising lines of endeavor, and ask good questions. But these activities cannot measure program effectiveness. Finally, we must be skeptical about definitions of the social indicators enterprise which confine it to social engineering efforts.

The issue is not whether social indicators are useful for policy but, rather, how this usefulness comes about. The interest in social indicators has stimulated a revival of interest in quantitative, comparative, social analysis (*60*), in the analysis of social change, in conceptual and measurement work on such topics as prejudice, crime, and learning, and in the development of models of social processes. The fruit of these efforts will be more directly a contribution to the policy-maker's cognition than to his decisions. Decision emerges from a mosaic of inputs, including valuational and political, as well as technical components. The work we have described deals with only one type of input; it is a contribution to the intellectual mapping process which is essential if decision-makers are to know what it is that has changed, and how the change has come about.

The character of the scientific contribution will, of course, vary with the subject. Models of a few social processes, such as those pertaining to social mobility and population dynamics, are in varying degrees of development and application. But for many other areas, the appropriate question is not "How does it work?" but "How has it changed?" And for still others, the question is "What is it?" The work of the Berkeley sociologists on the measurement of prejudice illustrates very well the interaction between measurement and conceptual development that is required to answer the question "What is it?" In the present state of work on this topic, the appropriate hypotheses are not so much concerned with the relationships of the phenomenon to others in a causal system, as they are with the nature of the phenomenon itself. What is being tested is a set of propositions that certain ways of thinking about social reality are productive, that a phenomenon as conceptualized is "there" in the reality being measured, and that the investigators have found a set of measures which tell us something we need to know about changes in the society.

It is apparent that many different types of work go on under the rubric of social indicators. What is important is that the field be seen as an arena for long-term development, as an effort of social scientists to push forward developments in concepts and in methodology that promise payoffs to both science and public policy. Such a view is reflected in the funding commitments of the National Science Foundation, which supports many of the research projects reported above. What we may expect of this work was aptly stated by Duncan (*61*):

> The value of improved measures of social change . . . is not that they necessarily resolve theoretical issues concerning social dynamics or settle pragmatic issues of social policy, but that they may permit those issues to be argued more productively.

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62. Preparation of this paper was supported in part by NSF grant GS-41704X from the Division of Social Sciences.

The Comparative Analysis of Learning

Are the laws of learning the same in all animals?

M. E. Bitterman

A surprisingly influential recent paper raises the question of "why there is no theory in comparative psychology" and answers that it is because of the inability of animal psychologists to deal with the "intricacies" of evolutionary history (*1*). The question is the wrong one, at least as it relates to learning, long the principal concern of animal psychologists (*2*). A better question is why there has been so little comparative research, and the answer is that work on learning has been dominated almost from the outset by a powerful theory which denies that learning has undergone any fundamental evolutionary change.

The comparative analysis of learning was begun by Edward L. Thorndike, the 100th anniversary of whose birth was celebrated last year. Darwin and his followers could only speculate about intellectual evolution on the basis of the rather questionable anecdotal materials available to them (*3*), but Thorndike brought the problem into the laboratory, systematically comparing the performance of fishes, chickens, cats, dogs, and monkeys in a series of analogous tasks (*4*). His results are, or should be, well known. While substantial quantitative differences were to be found in the performance of his various animals (monkeys, for example, seemed able to learn more than cats, and more quickly), the qualitative features of their performance were very much the same, and Thorndike suggested that the underlying processes also might be the same—not only in his own animals, but in all animals, including man (*5, 6*). The same opinion was arrived at independently by Pavlov, that other great innovator in research on animal intelligence, who confidently asserted the generality of the principles discovered in his experiments with dogs (*7, 8*). After a relatively brief period of dissent, during which many different animals were studied, Thorndike's view gained wide acceptance among psychologists. In consequence of that acceptance, there was a rapid decline in the scope of comparative

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