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On the Logic and Strategies of Sociological Inquiry

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By

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PREFACE

My intention to write this paper is to express and systematize the major concepts and principles I have learnt as a student of sociological methodology. The basic objective of the paper is thus two-fold: (1) to review some of the important literature concerning research methods in the study of social behavior, and (2) to organize some of the essential ideas in a logical sequence. It is hoped that my fellow colleagues and students would benefit from knowing some of the literature and from understanding the way I perceive methodology.

Every academician has his own intellectual preference. There seems to be two major schools of thought in sociological methodology; they are (1) the variable analysis approach, as represented by Paul F. Lazarsfeld, and (2) naturalistic or symbolic interactionist approach, as represented by Herbert Blumer. It should be underscored that my personal orientation is more toward variable analysis than symbolic interactionism. As a result, the ideas developed by symbolic interactionists will be de-emphasized in this paper. It, of course, does not mean that they are less important. The choice is inevitably narrowed by my own orientation in methodology. For an overview of the symbolic interactionist approach to social research, two books are recommended: Herbert Blumer's Symbolic Interactionism: Perspective and Method (N.J.: Prentice-Hall, Inc., 1969), and Norman K. Denzin's The Research Act: A Theoretical Introduction to Sociological Methods (Chicago: Aldine Publishing Co., 1970).

Finally I would like to express my gratitude to the late Professor Edward A. Suchman and Professor Jiri Nehnevajsa. As my teachers in graduate school, they have substantially influenced my research acts and thinking.

ON THE LOGIC AND STRATEGIES OF SOCIOLOGICAL INQUIRY

Every human group has a body of knowledge about the social and physical realities. Human knowledge is, however, based on the particular patterns of social activity and especially the ways of inquiry (Manheim, 1936; and Berger and Luckman, 1966). In other words, different ways of acquiring and accumulating knowledge will lead to the construction of different social and physical realities. In order to comprehend the substantive content of sociological knowledge, we should therefore understand the logic of inquiry employed by most professional sociologists of today. The purpose of this paper is to conceptualize, through the use of a flow-chart, the major assumptions and strategies (components and steps) of sociological inquiry.

I. SOCIOLOGY AS A SCIENTIFIC DISCIPLINE

The discipline of sociology is primarily concerned with the analysis of social reality, i.e. the patterns of social interaction. Since social reality is made up of symbols, it is legitimate to say that the discipline of sociology has a humanistic tradition (Zetterberg, 1965). However, instead of regarding sociology as a humanistic discipline, many sociologists have attempted to move in the direction of science. The statement that sociology is a science can be found in almost all the contemporary introductory textbooks in sociology.

The notion of "science" generally implies a set of attributes or elements which can be explicated as: an objective, logical, and systematic method of analysis of phenomena, devised to permit the accumulation of reliable knowledge[1]. The basic feature of a scientific discipline is therefore its form

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[1] For a detailed discussion on the various components of this definition, see Lastrucci (1963). Pearson (1911) and Nagel (1961) have also given an excellent analysis of the structure and problems of scientific inquiry.

or method of inquiry, rather than its particular subject matter. Physics, Chemistry, and Biology are labelled as scientific disciplines because of their use of scientific method in the analysis of inorganic and/or organic realities. Similarly, sociology can claim to be a science if it also attempts to adopt the scientific method in its analysis of social or behavioral reality[2]. In other words, it is the method, not the subject matter, which can justify sociology as a scientific discipline. To increase the scientific value of sociological knowledge, sociologists should hence be concerned with their methods or strategies of inquiry. This concern has led to the development of a sub-field within the general area of sociology, that is methodology.

II. DEFINITION OF METHODOLOGY

Methodology can be broadly conceived as a body of normative knowledge (Kaplan, 1964). It is the study — description, analysis, explanation and justification — of methods and techniques, rather than the methods and techniques themselves. It thus provides a set of standards which prepare, guide, and finally evaluate the researcher's role-action in the course of discovering and ascertaining social facts. In other words, methodology is the "rule of the game" which constrains the past, the present, and the future of a particular research process.

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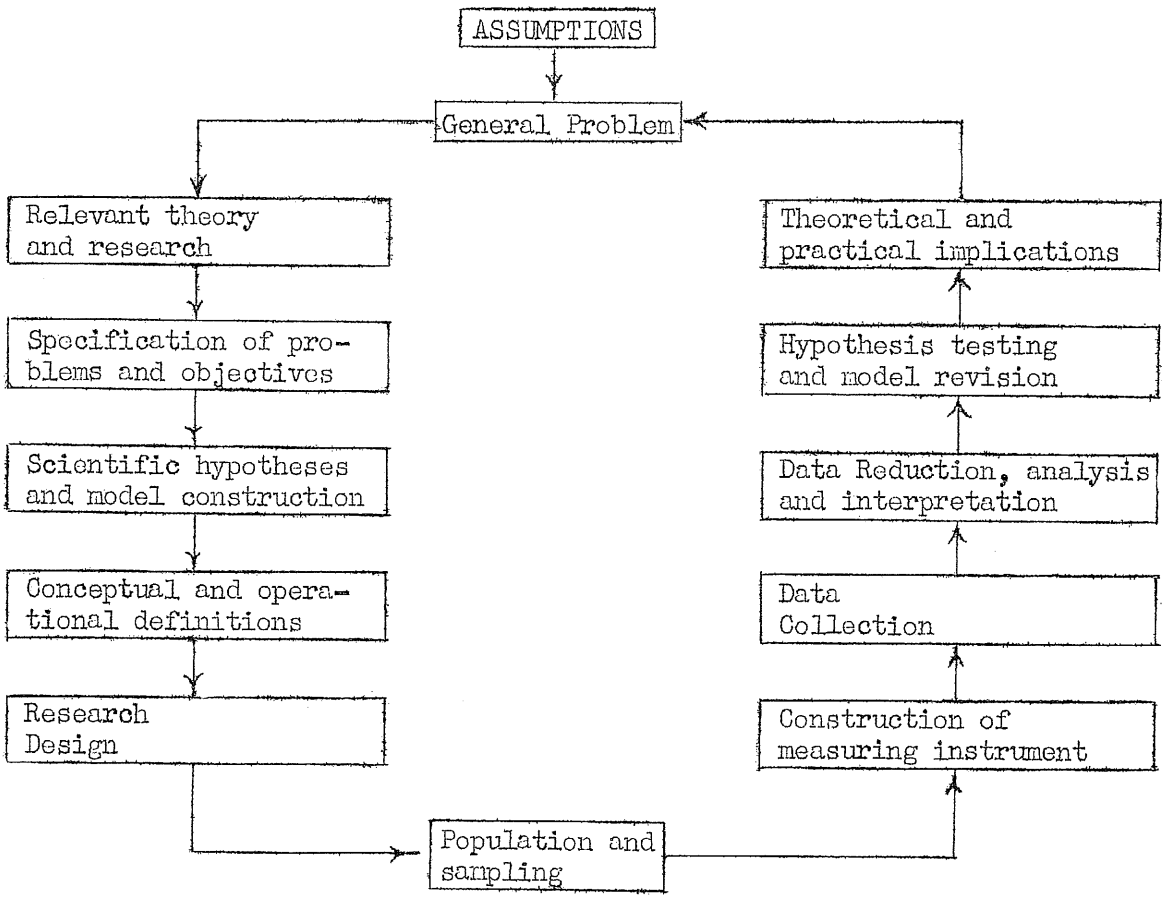
2 Social reality however is different from physical reality. Some sociologists and philosophers are skeptical of the applicability of scientific method to the analysis of social reality. For a discussion on some crucial dimensions of this issue, see Natneson (1963) and Handy (1964).

III. PROCESS OF SCIENTIFIC RESEARCH

Social scientific research can be viewed as an on-going process of problem-defining, decision-making, and problem-solving. It is essentially a dynamic, rather than static, activity in a social-cultural setting. The overall goal of this on-going process is the optimal solution of particular problems under study. How optimal the solution is, however, depends on the methodological strategies to be used. From a vertical point of view, the various strategies can be analytically, though somewhat arbitrarily, classified into several major steps outlined in the following flow-chart:



This flow-chart represents an "ideal" chain of action in the process of social research. In practice, these steps or components do not necessarily rigidly follow one another. Nevertheless, it should be underscored that these steps or components are closely interlinked with each other in a research process. Each step is functionally related to, and is also a constraint of, other steps. Every research action should take into consideration the past as well as the future actions.

In every research step, the researcher is usually confronted with a choice between various alternative strategies. His decision-making will, of course, have differential implications to the research out-come. It should, however, be noted that all social research is conducted in a socio-cultural setting, rather than in a vacuum or on a desert island. Each step is basically an action-in-context. It is involved with various contextual elements; they are (1) space, (2) time, (3) acts, (4) actors, including research personnel, respondents, and other persons related to the study, (5) interrelations among actors, (6) symbols, (7) social values and (8) material resources. In addition to the body of established sociological knowledge and its methodolgical norms, these contextual elements also determine the various phases of a particular research process[3]. A research activity can be regarded as a process of interaction in a particular time and space among socially interrelated actors under the constraint of symbols, social values, and material resources.

The making of a decision on the use of a particular strategy should therefore be based not only on purely methodological considerations but also on the knowledge and expectations of various contextual elements. In other words, the "established" methodological norms and the situations emerging from

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[3] For illustrations of the effects of social context upon the operation of some major research projects in sociology, see the various articles in Hammond (1964). Julian Simon (1969) has given an excellent discussion on the obstacles in social research.

reality should be balanced. An "optimal" strategy can be defined as the one which can maximally approximate the methodological norms within the existing contextual limitations.

Having briefly described some of the major dimensions of a scientific research, I would like now to outline and discuss some methodological norms or principles which should be considered in each major step of the research process[4].

A. Assumptions

Different persons may observe the same object with different interpretations. These interpretations usually depend upon some prior knowledge presumably related to that object. Before the initiating of his research projects, the researcher should thus be aware of certain basic assumptions underlying his role-action. For instance, it is usually assumed that social reality is law-like in form (i.e., it exhibits regularity or patterned sequences), and this regularity can be discerned and accounted for by the human mind; that attributes of the whole can be abstracted and compared; and that the activity of scientific analysis can be separated from the activity of the phenomena under study.

B. General Problem

All scientific inquiry stems from a problem. Why is the research initiated? What is one trying to find out? Replies to these questions are prerequisite to the further development of research process. There are in

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4 For a more concrete and detailed discussion on various aspects of social research, the reader is recommended to read Kerlinger (1965), Selltiz, et al. (1963), Lazarsfeld & Rosenberg (1955), Galtung (1967), and Simon (1969).

general three sources of research problems: (1) solution of practical problems, (2) testing and validation of theories and/or concepts, (3) modification of methodological principles.

C. Relevant Theory and Research

In order to conceptualize and specify problems in a testable manner, and to search for hints for an optimal problem solution, the researcher begins with "library" research. What has been done before in regard to the present problem? and how? He should be able to link the problem to a theoretical framework, to previous research and to available information.

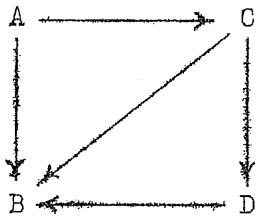
A theory is a system of statements or propositions, which attempts to present a simple but fundamental structure of the complex reality by interconnecting several abstract concepts in a meaningful way. It is the "middle range" theories which are often employed by empirical sociologists to delineate the research problem under study, to give meaning to research findings, and to permit generalization and prediction beyond the immediate research (Merton, 1957; Zetterberg, 1963). In addition to the theoretical consideration, it is important to review previous research findings and available information as they may provide insights into the problem and may suggest relevant variables as well as methods or techniques of inquiry.

D. Specification of Problems and Objectives

In light of the theory and previous research, the researcher redefines the general problem into one or more specific statements. Each statement of the problem or objective must be formulated in such a way that it is clear-cut, and testable by available methods of scientific inquiry and by available sources of data. A specification of the problem also means a delimitation of the scope of investigation so that it is a manageable size.

E. Scientific Hypotheses and Model Construction

A scientific hypothesis is a reformulation of the specific statement of the problem in a form readily subject to testing by empirical data. Usually it deals with an expected relationship between two or more variables. The classic form of hypothesis is "the more A, the more B." A particular piece of research may have several hypotheses (or subhypotheses). These hypotheses, however, should be transformed into a meaningfully organized and coherent network or system of variables, namely a model. A model is a system or synthesis of interrelated hypotheses. It attempts to conceptualize and simplify reality in terms of certain assumptions, such as those about replication of events, direction of causality, measurement scales, and outside disturbing influences. For example, if there are four variables A, B, C, D, then a causal model may be built as follows:



This model obviously implies a set of 1st order, 2nd order and 3rd order correlation hypotheses; they are, for instance, the relationships between (1) A and C, (2) D and B while controlling on C, and (3) A and B while controlling on both C and D.

F. Conceptual and Operational Definitions

A concept is an idea or a symbol representing a complex set of empirical facts or phenomena. To delineate the scope of concern and to inter-connect concepts in a meaningful way, the researcher must explicitly

define the "boundary" of each concept in clear, unequivocal, and sometimes abstract, terms. What object elements, or components, must it include? And yet what object elements, or components, must it exclude?

After an elaborate examination of the object elements, it may be found that the concept under study is not unitary but consists of a complex combination of phenomena. This overall concept should then be broken into several dimensions or components so as to achieve a more precise understanding and explanation of the phenomena under study[5].

A concept should also be operationally defined. It must be studied in terms of its empirical reference. Each concept implies a universe of indicators or indices. For practical reasons, we could not consider all indicators in a single study. Since indices are mostly inter-changeable[6], we normally sample a subset of observable indices from the conceptual universe for empircial investigation. This linking between the conceptual domain and the empirical world, however, brings up the problem of measurement.

Measurement refers to the process of assigning numbers or labels to objects or events according to specific rules (Stevens, 1951; Coombs, 1953). These numerical or labelling categories must be exhaustive and mutually exclusive. There are four levels of measurement; ranging from the lowest to the highest level, they are nominal, ordinal, interval, and ratio scales.

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5 For example, the concept "authoritarianism" can be broken into 9 dimensions; namely, conventionalism, authoritarian submission, authoritarian aggression, anti-intraception, superstition and sterotypy, power and toughness, destructiveness and cynicism, projectivity, and exaggerated concern with sex (Adorno, et al., 1950). The concept "alienation" can be subdivided into five components; namely, powerlessness, meaninglessness, normlessness, isolation, and self-estrangement (Neal & Retting, 1957). The concept "social class" can be broken into at least 3 components; namely, residence, occupation, and education (Hollingshead and Redlich, 1958).

6 See H. Horwitz & E. Smith, "The Interchangeability of Socio-economic Indices" in Lazarsfeld and Rosenberg (1955).

The process of measurement requires certain assumptions about the mathematical properties or relations between objects or events being measured; properties such as reflexivity, symmetry, transitivity, and their counterparts. Different levels of measurement require different assumptions about mathematical relations, and will then allow for different kinds of arithmetic operations including addition, subtraction, multiplication, and division. The use of different measurement scales will therefore present different constraints on the selection of statistical techniques for subsequent data analysis. It should be noted that a higher level of measurement possesses all properties of a lower level of measurement. A goal of science is to achieve or approximate the measurement ideal, i.e., the ratio scale which allows for all kinds of arithmetic operations. Most measurements in sociological research, however, are on either nominal or ordinal levels.

Measuring concepts will generate variables. A variable is a noun plus attributes. In other words, it is a symbol to which numerical values or labelling categories are assigned. An important way to classify sociological variables is in terms of their positions in a causal network. A "dependent" variable represents the phenomenon to be explained; an "independent" variable is the presumed cause of the dependent variable; a "test" or "control" variable is employed to examine and elaborate the original relationship between independent and dependent variables.

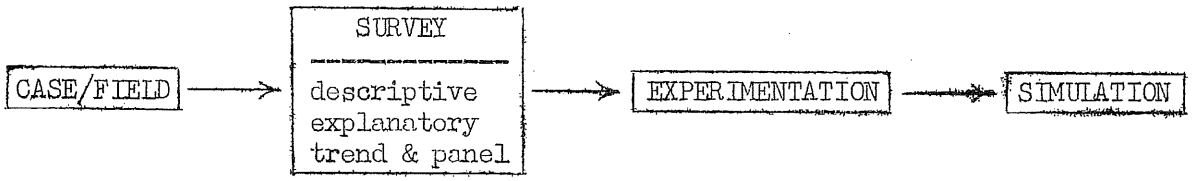
The progress of science is dependent on the precision of its measure-ment. However as Blalock (1968) has repeatedly asserted, the gap between theory and empirical research in sociology is primarily due to measurement errors. Social researchers should therefore be aware of, and attempt to minimize, the sources of measurement error.

Unreliability and invalidity are considered as the two basic sources of measurement error. Unreliability refers to the degree of inconsistency between repeated observations, while invalidity refers to the degree of incongruence between observation and what it intends to measure.

An important strategy to reduce unreliability and invalidity is to use multiple indicators to measure the underlying concept, and then to combine them into a composite index through the use of scaling techniques. The most important types of scale analysis in social research are equal-appearing interval (Thurstone) scales, summated rating (Likert) scales, and cumulative (Guttman) scales[7]. Thurstone and Likert scales require an assumption of interval level of measurement, while Guttman scales can work with ordinal data.

G. Research Design

The task of a research design is to organize the procedure of study so that relevant data are collected and hypotheses are tested. There are in general four major types of design, which could be arranged in terms of degree of sophistication as below:



If there is insufficient theoretical or empirical knowledge on the research problem, the researcher may start with a case of field study, which intensively investigates the historical development and current state of affairs of the diverse components of a single case through the use of various techniques such as field observation, depth interview, and collection of

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[7] For a discussion on the logic and uses of some scaling techniques widely used in social research, see Edwards (1957), Miller (1964), and Stouffer, et al. (1950).

available documents. The case under exploration may be either a "typical" or a "deviant" case. A major contribution of this type of research design is to search for significant variables and for meaningful interpretation of their interconnections, so as to lay a groundwork for more systemic and rigorous study (Junker, 1960; Festinger & Katz, 1953: Chapter 2).

The researcher may then move to a sample survey design (Hyman, 1955; Glock, 1967; Rosenberg, 1968). A descriptive survey analysis may first be done to measure one or more dependent variables precisely, so that the proper conceptualization of phenomena can be achieved. An explanatory survey may then be initiated to explain the phenomenon with one or more independent variables. For a study of the relationship between variables over time, the researcher may advance to either trend study with repeated interviews of different samples at different points in time, or panel design with repeated interviews of the same respondents on more than one occasion (Lazarsfeld & Rosenberg, 1955; Zeisel, 1957; Harris, 1962; Coleman, 1964; and Blalock & Blalock, 1968). Both trend and panel studies can indicate the net change over time. However, it is the panel design which can identify the amount and the direction of internal shifts, and can evaluate the causal priorities between variables (Pelz & Andrews, 1964).

A major principle for the construction of research design is to maximize the control of variance, i.e., to maximize the variance of the variables under study but minimize the extraneous and error variance. The researcher may therefore move to a field or laboratory experimental design. Experimentation is regarded as an "ideal" model primarily because of its basic feature of controlling. Since the less a research design deviates from the experimental ideal the better it is, every researcher should be familiar with different types of experimental design (Chapin, 1947; Stouffer, 1950; Campbell & Stanley, 1963).

Finally the researcher may conduct a simulation study, in order to discover the dynamics or the complex process of interaction among units and variables over time. Briefly, simulation in social science refers to the building and manipulation of an operating model which is a physical or symbolic representation of all or some aspects of a social process (Guetzkow, 1962; Borko, 1962). Simulation can be conducted on machines (especially electronic computer) and/or human actors.

We have discussed several research designs. It should be stressed that these designs are only analytically separable. In actual practice, a combination of two or more designs is often employed in a single study (see, for example, Lipset, Traw and Coleman, 1956). Furthermore, these designs were presented here in an "ideal" sequential order, but it is of course not necessary for a multiple-design research to observe this sequence; a sample survey, for example, can be followed by a "deviant" case study.

H. Population and Sampling

The population or the grouping of units for study must be operationally defined before a sample or a subset of the population is drawn. The sample design deals jointly with procedures of selection and of estimation (Hansen, et al., 1953; Kish, 1965). The methods of selection can be classified into two categories: (1) Judgement or non-probability sampling, such as accidental, purposive, and quota sampling; and (2) Probability sampling, such as simple random, systematic, stratified, cluster, and multi-stage sampling. In judgement sampling, units are drawn with unknown probabilities; while in probability sampling, units are drawn with known probabilities. The researcher can therefore estimate the sampling error on the basis of the results of a probability sample, but not those of a judgement sample. The precision of results, however,

is determined by the sample size and the sampling method being employed. Different sample sizes and different sampling methods will of course demand a different cost, including manpower, time, and money. As a rule of thumb, the social researcher should choose a sample size and a method such that he can obtain results of maximum precision for a given cost.

I. Construction of Measuring Instruments

In a field study the researcher may employ depth interviews or observational methods, and his instrument may either be: (1) an unstructured schedule with the barest outline of the points to be covered, or (2) a structured design with a highly developed code.

Most sociological studies are involved with the use of questionnaires. The formulation and the desirability of each question or item depends on its purpose, the conditions of administration, characteristics of respondents, and the plans for analysis. Furthermore, questionnaire items can be classified into three kinds: (1) identification information, (2) social background data, and (3) factual or attitudinal questions on the subject matters of the study (Parten, 1950: Chapter 6). Pre-coding of questionnaire items is preferable as this will facilitate, and reduce the error of, the subsequent stage of data reduction and analysis.

Pre-testing of the measuring instrument against a limited number of cases is necessary before it is implemented to all sample units. Results of the pre-testing may help the researcher find out in what ways the instrument should be revised so as to increase its reliability and validity.

J. Data Collection

Secondary data or documentary material may be secured from a variety of sources such as archives, censuses and histories, etc.. Primary data or new information is usually assembled either by observing or questioning the units under study. The researcher may make an observation with or without participation in the situation (Junker, 1960). However, sociological data are frequently collected through the use of questionnaires (Hyman, 1954). The researcher communicates the content of a questionnaire to the respondent, either by mail or in an interviewing situation. The interviewing is basically an interaction between two role-players known as interviewer and respondent. There are three essential phases of the interviewer's role-performance: (1) sampling, (2) obtaining accurate information, and (3) recording. However, since interactions between role-actors with different social, cultural, and psychological components will produce different outcomes, the compatibility of interviewers to respondents becomes an essential issue. A competent researcher should minimize the sources of bias or errors arising from the interview processes.

K. Data Reducation, Analysis and Interpretation

Social science data have a common structure, which consists of three parts: (1) the elements or units of analysis, (2) the dimensions or variables, and (3) the values of the units on the variables studied (Galtung, 1967). Before the data are tabulated by hand or by machine, they must be carefully edited and coded, and they may be punched on cards (Parten, 1950: Chapters 13-15). Various kinds of statistical model can then be employed to analyze the data (Zeisel, 1957; Blalock, 1960; Cooley & Lohn, 1962; Hays, 1966). There are two major types of statistical techniques: (1) descriptive statistics, which attempt to describe and summarize the distribution of units on one or

more variables, and (2) inferential or inductive statistics, which attempt to infer sample statistics to population parameters on the basis of probability theory. It should be stressed that (1) inferential statistics should not be applied to studies of total population or non-probability samples (Selvin, 1957); (2) with a probability sample, an inferential statistical model can be used to indicate the presence or absence of relationship in the population, but not the strength of association; and (3) the power of a statistical test is directly related to the sample size. Since most sociological studies are carried out with large samples, the use of descriptive or correlational statistics are relatively more important than that of inferential statistics.

Both descriptive and inferential statistics can also be classified in terms of parametric and non-parametric statistical models. In general, parametric statistical tests are more powerful than non-parametric tests, but they also require more assumptions about the population parameters such as normality and equal variance, and about the measurement scales (Siegel 1956). Since (1) the power of a statistical test could be increased by a larger sample and (2) most of the statistical assumptions may not be met in sociological research, the importance of non-parametric statistics should not be disregarded. As a rule of thumb, the selection of a particular test is optimal if (1) this test is most powerful with the given sample size and (2) the statistical assumptions required by the test are met. However, it is the plight of statistical analysis that for a given sample size the higher the power of a statistical test, the stronger will be the required statistical assumptions.

Most of the parametric and non-parametric descriptive statistics are concerned with the analysis of the strength of relations among variables studied (Lee, 1969). A relation can be conceptually defined as a set of ordered pairs of objects (Kerlinger, 1965: Chapter 6). It is noted that different measures

of association will require different statistical assumptions such as measure -ment scales, additivity, linearity, and symmetric relation, and will yield to different kinds of interpretation. A particular research should use those parametric or non-parametric statistical measures of which (1) the assumptions can be maximally approximated and (2) the interpretation is relevant to its research purposes.

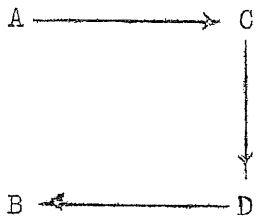
Data analysis usually begins from lower-order to higher-order correlations. For each dummy table or correlation, the researcher should ask: what does it show? and why? The second question may be answered either in terms of a theoretical explanation which requires no more data, or by introducing other variables which have empricial data. If the multivariate analysis, rather than the theoretical interpretation, is used, then the order of correlation analysis will be gradually built up. Whenever a new variable is introduced, there may be four possible types of statistical relations: (1) spuriousness, (2) interpretation, (3) specification, and (4) contingency (Hyman, 1955).

The notion "variable analysis" could be analytically broken into four levels: (1) individual analysis, (2) contextual analysis, (3) group analysis, and (4) structural analysis (Robinson, 1950; Campbell & Alexander, 1965). A single project could combine them together and form a multiple level analysis. The researcher, however, should be cautious of certain fallacies such as the ecological fallacy (Riley, 1964).

L. Hypothesis Testing and Model Revision

The statistical manipulation of data is for the purpose of testing hypotheses. A confirmation or falsification of particular hypotheses would determine the "goodness of fit" of the observable data to the original model.

It should be noted that the statistical or quantitative importance of a particular variable is different from its causal or substantive importance (Blalock 1961). In the construction and evaluation of causal models, one should consider both substantive and statistical criteria. However, no single model should be given as "correct". In view of the data analyzed, the model should be reconstructed and refined so as to maximize its approximation to reality[8]. For example, if the relationship between A and B, and between C and B, are found to be spurious, then the original four-variate model may become:



M. Theoretical and Practical Implications

To conclude the research project, a researcher should explicitly discuss the contribution of his research findings to the theoretical domain and/or the practical world. He may suggest solutions to practical problems, or open up some other practical problem areas for futher research. He may also validate, modify, or reconfirm the original theories or methodological principles, or suggest some other theoretical and/or methodological problems for futher investigation.

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[8] For an excellent discussion on the logic and procedures of model-testing, see Simon (1957), Blalock (1964), and Raymond Bondon, "A New Look at Correlation Analysis" in Blalock & Blalock (1968).

Solution of practical problems and/or validation of theoretical principles will directly or indirectly ascertain the basic assumptions underlying the research process. Suggestions for further research areas will contribute to the continuity of scientific inquiry and the accumulation of scientific knowledge.

IV. CONCLUSION

The discipline of sociology attempts to acquire and accumulate systematic knowledge about the diverse components of social reality, through the use of scientific methods or strategies. The process of social scientific inquiry can be conceived as an on-going activity in a socio-cultural context. Its overall goal is to explain and to verify the particular sociological problem under study with optimal strategies. The choice of particular strategies, however, is dependent not only on the established methodological norms, but also on the existing contextual elements. A particular strategy is optimal if the methodological norms are balanced with the existing contextual constraints and resources.

On the basis of certain assumptions about the social reality, a social scientific research process normally begins with a general problem and a review of relevant theoretical and empirical literature. The various dimensions of the general problem are then delineated and specified in terms of a theoretical framework and of the available information related to the problem. Before the collection of data for the purpose of explaining and verifying the particular problems under study, social researchers are expected to formulate testable hypotheses, organize these hypotheses into a model, conceptually and operationally define various concepts, select a research design, delineate the population of study, determine the sampling procedures,

construct and pre-test the measuring instruments. The data collected should then be reduced, analyzed, and interpreted through the use of appropriate statistical techniques, so as to test hypotheses and to refine the original model. Finally, the research process should be concluded with statements on the theoretical and/or practical implications of its research findings.

V. ISSUES

Like other developing disciplines, sociology is confronted with many issues (See Handy, 1964; Braybrooke, 1965; Nathanson, 1963). This paper would like to briefly discuss two; namely, quantitiative versus qualitative orientations, and macroscopic versus microscopic analyses.

As mathematics is regarded as the most exact and precise language, empirical sociologists have been placing increasing emphasis on quantification of social information (Coleman, 1964; Tufte, 1970). It is believed that this trend will eventually make sociology an exact, or more exact, science. It should however be kept in mind that quantitative analysis be based on, or supplemented by, a substantive-qualitative understanding of the social reality (Filstead, 1971). Without substantive insights, our efforts to play with numbers or numerals would be of little or no significance. Max Weber's postulate of subjective interpretation should receive our careful reconsideration (Weber, 1949).

Pioneer sociologists, such as Max Weber and Emile Durkheim, were primarily concerned with macroscopic analysis of social reality. Over the last hundred years, however, most empirical sociologists have conducted studies on microscopic level. It is a sociological fact that in human societies, the whole is different from its individual parts as well as the total sum of its

parts. These micro-sociologists have thus contributed to our "piece-meal" understanding of particular parts of human societies, but are not of much help to our understanding and prediction of the operation of total society. This trend of microscopic analysis might be due to the limitation of the existing methodological tools. It is more difficult to study the whole than its individual components. Nevertheless in order to comprehend the structure and functioning of total society, empirical sociologists of today are strongly encouraged to enhance and develop their macroscopic strategies of inquiry (Coleman, 1970). The idea of "social indicators" represents an effort toward macroscopic analysis of social reality (Bauer, 1966).

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