



**QUANTITATIVE
METHODS
in SOCIAL WORK**

**STATE
of the ART**

David F. Gillespie & Charles Glisson
Editors

Quantitative Methods in Social Work: State of the Art

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Toward the Development of Quantitative Methods in Social Work Research

Charles Glisson
David F. Gillespie

The following paragraph describes the medical care received by Charles II of England in 1685.

A pint of blood was extracted from his right arm; then eight ounces from the left shoulder; next an emetic, two physics, and an enema consisting of 15 substances. Then his head was shaved and a blister raised on the scalp. To purge the brain a sneezing powder was given, then cowslip powder to strengthen it. Meanwhile more emetics, soothing drinks and more bleeding; also a plaster of pitch and pigeon dung applied to the royal feet. Not to leave anything undone, the following substances were taken internally: melon seeds, manna, slippery elm, black cherry water, extract of lily of the valley, peony, lavender, pearls dissolved in vinegar, gentian root, nutmeg, and finally 40 drops of extract of human skull. As a last resort, bezoar stone was employed. But the royal patient died. (MacKinney, 1937:33)

Because he was a member of the royal family, Charles II received what was thought to be the best medical treatment available. Certainly, commoners could not have hoped for such intensive medical attention. Of course they were undoubtedly better off for it since many deaths can now be traced directly to the treatments. In fact, until about 1900, calling in a physician to attend the sick appears to have decreased the patient's chances for survival (Hardin, 1972: 57-58). It wasn't until medical research demonstrated the effectiveness of sulfa drugs in the 1930's and antibiotics in the 1940's that medical treatment began to

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increase significantly a patient's chances of survival. Today, morbidity and mortality rates are generally reduced with appropriate and timely medical care.

Contemporary social work practice may not resemble the antiquated medical care of the 1600's. Yet much of what social workers do must be accepted on the type of faith that guided the treatment of Charles II. Critics accuse social work practitioners of relying on interventions which are ineffective and in some cases harmful. Moreover, social work research efforts have failed to quell doubts concerning social work interventions. Even the staunchest defenders of social work research would not claim that it has contributed significantly to or documented convincingly the effectiveness of practice. There are multiple reasons for this, some related to the nature of the problems addressed by social workers, some related to the training received by social workers, and some related to the deficits in the research conducted by social workers.

The deficits in social work research efforts to establish practice efficacy are addressed here. The deficits are both theoretical and methodological in origin. Social science research and more recently social work research have become increasingly empirically grounded. Unfortunately, it is for this reason that data collection and data analysis have become all too often the central activities of social science research. Because of this, critics have chided social work researchers for their failure to conduct research which is oriented to practice issues and of addressing technical or scientific concerns which have little direct relevance to practice. Social work researchers have also been taken to task by their colleagues for neglecting to link their research findings with substantive theories, and for collecting data and running analyses without any firm research purpose in mind. These criticisms call for a careful critique of the state of the art of social work research, and in particular an examination of the contributions of theory and method to the practice relevance of research outcomes.

Most scientific research rests on the relationship between substantive theory and methods of inquiry. Unfortunately, the separation of substance and method is more characteristic of the social sciences than of the physical sciences. For example, it is common for research methods to be discussed as an integral part of the substantive content of textbooks in biology and physics. This blending of method and substance occurs, in part, because research and theory development in these sciences are approached as puzzle-solving (Kuhn, 1962; Laudan, 1977). In other words, these sciences view theory as derived from solving puzzles (i.e., problems) and view research methods as essential to solving the puzzles. As a result, substantive areas are not addressed analytically apart from the methods used to solve the relevant puzzles.

Social work texts are devoted more often than not to either substantive theory or to research methodology that is devoid of substantive applications. This separation of substantive theory and research methodology has contributed to a breach between what should be inseparable parts of the research process. More emphasis on puzzle or problem-solving in social work research could help bridge

the gap between substance and method and also help deal with some of the issues dividing researchers and practitioners. However, this problem-solving approach requires a greater appreciation and understanding of research methods by social work practitioners. Likewise, this approach also requires a greater appreciation and understanding of substantive practice areas by social work researchers.

The suggestion that social work researchers become more involved in practice while practitioners become more knowledgeable of research methods has become a common platitude and may be viewed as desirable but unrealistic given the intense and continuous demands on each of these roles (Austin, 1991). On the other hand, recent trends indicate the possibility of a convergence. First, the rapidly spreading use of micro computers in both practice and social work research provide a common link in the way information is processed. Second, the emphasis on accountability and evaluation is creating the need in the practice community for information which can be used to solve problems. Third, menu driven software is rendering sophisticated methodological techniques accessible to the beginning problem or puzzle-solver. Still, it is clear that social work research is in a neophyte stage and that considerable work is needed before social workers will be able to produce a substantial body of relevant, high-quality research that contributes directly to the solution of the most critical puzzles and problems which social workers face in their practice.

NIMH TASK FORCE ON SOCIAL WORK RESEARCH

By forming the NIMH Task Force on Social Work Research, the National Institute of Mental Health can be credited with beginning one of the first nationally organized efforts to improve social work research. The Task Force recently completed a three-year effort to understand why so few social work researchers are among the social, behavioral and biological scientists who are supported by NIMH to conduct mental health-related research. The Task Force found evidence that social work researchers do not have the research skills to compete successfully for research funding. Reports commissioned by the Task Force document deficiencies in both the quality of social work research training and the quality of published social work research.

In one report commissioned by the Task Force, Glisson (1990) summarizes the social work research published over a twelve-year period. The report is based on an analysis of all of the research articles published from 1977 through 1988 in five major social work journals: *Journal of Social Service Research*, *Journal of Social Work Education*, *Social Service Review*, *Social Work*, and *Social Work Research and Abstracts*. The findings provide a description of the underdeveloped state of social work research and point to several problems confronting efforts to develop research-based knowledge for social work. A parallel study commissioned by the Task Force to examine additional journals reports similar findings (Fraser and Taylor, 1990).

A summary of some of the findings of the Glisson (1990) report are provided below as an introduction to a discussion of the development of quantitative methods in social work research. The report defines research broadly. An article is considered research-based if the author bases conclusions on any type of systematic observations. This includes case studies, field studies, historical research, and single subject research, as well as survey, experimental and quasi-experimental research. Of the almost two thousand articles published in the five journals from 1977 through 1988, only a little more than half (1,053) can be labeled research-based using this broad definition. Both the numbers and the proportions of research articles published in these journals annually have remained stubbornly consistent, averaging 90 (53%) per year in the first six-year period and 85 (56%) per year in the second six-year period. In contrast, there is considerable variation between the individual journals in the proportions of published articles that are research-based. The proportions range from a high of 83% in the *Journal of Social Service Research* to a low of 39% in *Social Work*.

While the overall numbers and proportions of research articles published in the five journals have remained consistent over the twelve-year period, there are several trends evident in the research articles themselves. The more positive trends include an increased emphasis in the articles on effectiveness and outcome variables. Such research almost doubled from 27% of the research articles published in the first six years (1977-1982) to 52% of the research articles published in the second six years (1983-1988). This increase suggests the development of a greater practice orientation in research as social work scholars have become increasingly concerned with documenting effectiveness and outcomes (Austin, 1991).

A parallel trend has been the increase in the number of research articles that are concerned specifically with direct practice, particularly with individuals. In the last six years, half of the research articles concerned direct practice and 40% concerned direct practice with individuals. The heightened focus on direct practice with individuals stems partly from professional ideology and partly from the current disproportionate influence of psychology on social work practice and research. Although historically social work has drawn upon sociology, economics, political science, and other more macro-oriented social science disciplines, social work and psychology appear to be increasingly competing in the same practice arena for the same clients and in the same research arena for the same research funding, as found in the funding provided by NIMH.

Among the more negative findings concerning social work research is the steady dominance throughout the twelve-year period of quick, inexpensive and relatively simple research methods. Cross-sectional survey designs are reported in the majority of the research articles (63%). The design which is reported next most often is the case study (13%), followed by the quasi-experimental design (9%). In addition, 74% of the articles report research that relies on non-

representative samples of convenience. Moreover, while 85% of the articles rely on some type of quantitative analysis, half of these articles report only descriptive statistics such as percentages and means, or univariate statistics that incorporate only one independent and one dependent variable at a time. The risk of inferential error is high when these simplistic statistical techniques are coupled with the low internal validity and low external validity of the research strategies reported in these articles. This risk is particularly serious when inferences are being drawn about practice effectiveness and outcomes as is the case in half of the research articles published in the last six-year period.

Despite some of these negative findings, there is also evident a small but increasing concern in this literature with the further development of social work research methods. In 8% of the articles published in the last six-year period, attention is given specifically to the development of social work research methods. Moreover, the proportion of research articles incorporating more sophisticated multivariate data analytic techniques almost doubled from the first six years (8.7%) to the second six years (16.2%). There is, therefore, evidence that social work researchers are beginning to be interested in developing more sophisticated research methods and to incorporate more powerful analytic techniques in their research. The attraction of these more advanced methods and techniques is that they improve the researcher's ability to study complex social problems and interventions while reducing the risk of oversimplification and inferential error.

IMPLICATIONS OF THE NIMH REPORT FINDINGS

There are symbiotic relationships among three key aspects of the social work research effort. These are the social work researchers themselves, the social work doctoral programs which train them, and the social work research literature in which their work is published. The characteristics of each of these aspects informs and affects the other two. Glisson's (1990) report documents that the vast majority of the social work research literature is produced by those who have social work doctorates or are members of social work program faculties. Therefore, inadequacies identified in existing social work research are to some extent maintained in a "cycle of poverty" of knowledge: poorly trained researchers produce poor research and poorly trained researchers who, in turn, produce more poor research and more poorly trained researchers.

The evidence provided in the report confirms Glisson's previous findings concerning poor statistical training received by social workers (Glisson and Fischer, 1987) and the inadequate application of statistical analyses in published social work research (Glisson, 1985). Because the more sophisticated analytic techniques are currently found in only about 16% of the research articles and because the research articles represent only about half of the articles published

in the major social work journals, it can be assumed that knowledge of sophisticated methods among social work researchers remains limited.

These conclusions suggest the need for more information concerning the levels of expertise among those who are developing and using social work research knowledge. This also suggests the need for more widespread dissemination of existing research-based knowledge to social work researchers. Until there is a broader understanding and application of more sophisticated methods throughout the social work literature, we are unlikely to achieve research which will be useful in solving the most complex and critical problems facing social work practice.

A RESPONSE TO THE NEED

A group of social work researchers has recognized the need for a broader understanding and application of advanced research methods among social work researchers generally. Some three years ago, this group emerged to form the Quantitative Methods Interest Group (QMIG) for the purpose of developing and disseminating knowledge about the application of quantitative analytic techniques in social work research. Each year since its founding, the QMIG has sponsored a Quantitative Methods Symposium at the Council on Social Work Education Annual Program Meeting. In addition, the QMIG has compiled the papers in this collection, most of which were written by members of the interest group. The papers are intended to give examples of the most advanced research now being carried out in the profession in various areas of knowledge relevant to the field of social work. It is also intended that they will stimulate the further development of quantitative methodology among social work researchers.

The authors of the papers presented here assume that the reader is familiar with basic research methodology, including descriptive statistics and the elementary inferential statistics used most often in published social work research: t-tests, analysis of variance, and correlation/regression techniques. The papers address several significant methodological issues involved in using quantitative analytic techniques that are state-of-the-art for social work research. In most cases, the techniques are state-of-the-art in other disciplines as well, although in some papers the techniques are presented in their basic forms. This is consistent with the goal of stimulating the development of more advanced quantitative methods in social work research.

Three types of methodological issues are addressed in the papers: (1) measurement issues; (2) issues related to incorporating non-quantitative variables in quantitative data analyses; and (3) issues surrounding the use of quantitative analytic techniques to model and assess complex social phenomena. An elaboration of each of these three issues is presented below. Although the content of some of the papers overlaps more than one of these issues, they are grouped by the primary issue that is addressed.

Measurement

As in the social sciences generally, measurement issues in social work research are particularly problematic. Many of the variables that are of concern to social worker researchers are abstract constructs that are not easy to observe directly. Examples are self-esteem, depression and marital satisfaction measured at the individual level; cohesion, cooperation and participation at the group level; complexity, centralization and formalization at the organizational level; and stratification, power and oppression at the societal level. Attempts to assess such variables and estimate their accuracy are plagued with difficulties, yet very little work has been completed to date among social work researchers concerning measurement (see Hudson, 1982, for an exception).

The paper by Nugent and Hankins compares the application of the three major theories of measurement—classical, generalizability, and item response theories—to the evaluation of Hudson's (1982) Generalized Contentment Scale (GCS), an instrument that is used by both social work researchers and practitioners to measure depression. The paper compares the different types of measurement information provided by the three approaches and describes the strengths and weaknesses of each. In contrast, the paper by Kronick and Silver describes content analysis, a technique that is usually not considered a measurement technique, and applies it to the study of health policy using the Canada Health Act as an example. Content analysis is a method for identifying and measuring the occurrence of concepts, phrases, and other variables within the content of documents, transcripts, interviews and group interactions. The paper compares the utility of several software packages that can be used in content analyses and provides practical suggestions for improving their applications. The third measurement paper, by Orme and Fickling, illustrates the use of latent variable structural equation modeling (LISREL) in assessing the validity of a scale that is designed to measure a parent's knowledge of infant development. LISREL has continued to become more and more popular among social science researchers for confirming measurement models as well as for analyzing the structure of complex relationships among multiple exogenous and endogenous variables. Since applications of LISREL in social work research are rare, this paper makes an important contribution to this volume.

Incorporating Qualitative Variables into Quantitative Analyses

There are many methods for incorporating into quantitative analytic techniques variables which are commonly labeled nominal, categorical or qualitative. Analysis of variance is designed specifically for these types of independent variables. Qualitative variables also can be easily included in correlation/regression analyses with the aid of special coding. In addition to these relatively

common methods, there are other powerful analytic techniques designed specifically for qualitative variables; unfortunately these are used much less frequently by social work researchers. For example, logistic regression is designed for the analysis of qualitative dependent variables, loglinear analysis is designed for both qualitative independent and qualitative dependent variables, and event history analysis provides for the longitudinal analysis of a specific type of qualitative dependent variable, the occurrence of an event.

These three techniques, logistic regression, loglinear analysis and event history analysis, are described and applied in separate papers in this collection. Morrow-Howell and Proctor demonstrate the use of logistic regression in their research on the factors contributing to hospital readmissions among Medicare patients. Combs-Orme explains the application of log-linear analysis using examples from published social work studies of alcoholism and minority adolescent parents. Fraser, Pecora, Popuang and Haapala demonstrate the use of event history analysis in identifying the factors that contribute to the success or failure of family preservation services. These techniques have special significance to social work researchers because so many substantive and practice-related variables are qualitative in nature.

Modeling Complex Social Phenomena

Social work research is frequently concerned with complex social phenomena which cannot be accurately represented by simple bivariate relationships or by a collection of main effects. For example, moderator effects occur when the effect of one variable on another is contingent upon the values of a third variable. Koeske uses studies of worker burnout and income bias to describe a variety of moderation effects which, if ignored or unanalyzed, can pose threats to the validity of findings. In a related paper, Coulton and Chow use studies of depression and locus of control to describe the analysis of interactions using regression techniques that include continuous moderator variables rather than the more traditional categorical moderator variables.

Another example of complex social phenomena of interest to social work researchers is the nature of networks or relations among multiple social units. Whether the relationships describe networks of individuals, as in a family, or networks of organizations or other larger social units, depicting and analyzing the structure of relationships and their consequences can be frustrating if not impossible with the usual analytic approaches. Network analysis has been used with increasing frequency in anthropology and sociology to describe and understand complex networks, but is used infrequently in social work. Streeter and Gillespie present a basic explanation of network analysis and apply it to social service organizational networks that respond to natural disasters.

Many complex phenomena of interest to social work researchers are events that occur at different times for different members of a population of interest. These include events such as marriages, divorces, residential placements, spouse

abuse, adoptions, recidivism, and so forth. Although used more often by biostatisticians, sociologists, and economists than by social work researchers, event history analysis has been developed specifically for analyzing these types of phenomena with longitudinal data. As mentioned above, the paper by Fraser et al., describes the theoretical foundations of the method and provides an example by using event history analysis to identify factors that prevent or contribute to the out-of-home placement of children who participate in family preservation programs.

RELATED ISSUES

There are numerous issues related to quantitative methods in social work research that have not been addressed by the papers in this collection. These include issues of sampling and design, as well as additional issues surrounding measurement and data analysis. Several related multivariate analytic techniques that provide for the simultaneous analysis of multiple independent and multiple dependent variables are not considered here. These multivariate techniques include canonical analysis, multivariate analysis of variance, and multivariate multiple regression. Although the use of LISREL is described in the context of assessing a measurement model, its use in analyzing more complex structural equation models is not described. Finally, still other quantitative methods that are applied with increasing frequency in social work research are missing from this collection, including time-series analysis and meta-analysis.

The omission of papers that address these additional issues and methods is not intentional and is not intended to suggest that they are less important than those which have been included. Rather, it suggests that the major objectives of the present collection cannot be fully met with one volume. There is a need for subsequent similar collections.

At the same time, the articles that follow are successful in describing several distinct and effective strategies used by social work researchers in addressing three critical methodological issues within specific substantive contexts. These articles collectively represent some of the best research efforts currently found among social workers and provide both a guide and a challenge to social work researchers interested in the application of quantitative methods to social work problem-solving.

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