METHODS IN QUANTITATIVE CRIMINOLOGY

Edited by

James Alan Fox

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IN SOCIAL RELATIONS

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JAMES ALAN FOX
College of Criminal Justice
Northeastern University
Boston, Massachusetts

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Methods in Quantitative Criminology

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A complete list of titles in this series appears at the end of this volume.

To my mother and stepfather
Inez and Leo Burgin

List of Contributors

Numbers in parentheses indicate the pages on which the authors' contributions begin.

ARNOLD BARNETT (127), Sloan School of Management, Massachusetts Institute of Technology, Cambridge, Massachusetts 02138

GEORGE S. BRIDGES (59), Federal Justice Research Program, United States Department of Justice, Washington, D.C. 20530

STUART JAY DEUTSCH (171), School of Industrial and Systems Engineering, Georgia Institute of Technology, Atlanta, Georgia 30332

JOSEPH C. FISHER (99), Consulting Statisticians, Inc., 20 William Street, Wellesley Hills, Massachusetts 02181

JAMES ALAN FOX (41), College of Criminal Justice, Northeastern University, Boston, Massachusetts 02115

DAVID F. GREENBERG (1), Department of Sociology, New York University, New York, New York 10003

RONALD C. KESSLER (1), Department of Sociology, University of Michigan, Ann Arbor, Michigan 48109

LEE R. McPHETERS (147), Department of Economics, Arizona State University, Tempe, Arizona 85281

MICHAEL D. MALTZ (77), Department of Criminal Justice and Department of Systems Engineering, University of Illinois at Chicago Circle, Chicago, Illinois 60680

ROBERT L. MASON (99), Southwest Research Institute, San Antonio, Texas 78284

PAUL MAXIM (19), Department of Criminology, Simon Fraser University, Burnaby, B. C., Canada V5A 1S6

DON E. SCHLAGENHAUF (147), Department of Economics, Arizona State University, Tempe, Arizona 85281

PAUL E. TRACY (41), Center for Studies in Criminology and Criminal Law, University of Pennsylvania, Philadelphia, Pennsylvania 19104

Foreword

This particular volume, as well as its companion volume, is new and fascinating. It is new because no one before has brought such a group of scholars together, scholars who have the sensitivity of refined, detailed analysis that can use the currently most robust tools of a quantitative approach to the old problems of crime and punishment. It is fascinating in the etymological meaning: *fascinare,* from the Latin, meaning a spell, and akin to *fascina,* meaning a bundle—in this case, the collection of writings. If the reader is not spellbound, he will still find the allure of this volume seductive. The methods, the models, the paradigms are presented with clarity, conciseness, and a dignity of language that has not always blessed quantitative studies in social science.

Criminology, it has been said, is still in its infancy as a discipline. The assertion may be true; but this superbly collected and edited volume projects the discipline—whether labeled criminology or criminal justice—well into the firmament of solid science. Karl Pearson is alleged to have said that whatever exists exists in some quantity. This is a worthy proposition to contemplate. This volume, perhaps without the authors' consciousness of that proposition, attests to its validity.

Some persons not attuned to the mathematics and statistics involved in quantitative studies in criminology (or in social science generally) have claimed that the quantitative approach is a punchcard, nonhumanistic

methodology that is insensitive to the individual. This volume adds to the rebuttal of that assertion. Scholars who aggregate data are in the tradition of science that requires classifications and patterns of behavior. Such requirement does not at all denude aggregationists of their sensitivity to humanity; instead, they become even more concerned with the uniformity and regularity of human behavior than can the individualistic, naturalistic ethnographer who may record idiosyncratic behavior. The literary tradition of a Dostoevski is built not on a single case, albeit the story may be about a particular person; it is based on a literature of science that rejects null hypotheses, that strengthens our confidence in the truth of our findings.

University of Pennsylvania MARVIN E. WOLFGANG

Preface

A cursory glance at the recent literature in criminology clearly suggests a significant shift in the level of mathematical rigor brought to research efforts concerning crime and justice. A more careful inspection, however, indicates that this trend has been uneven across the literature. In particular, while modeling efforts in some areas (e.g., deterrence, recidivism, and criminal careers) have been appreciable, other research areas remain quantitatively underdeveloped.

Apparently a small but growing cadre of quantitatively skilled researchers has attended to a handful of research concerns, while other researchers have had difficulty remaining competitive with the advancing quantitative rigor of the social sciences in general and criminology in particular. Further, while the policy/theoretical utility of more mathematically sophisticated modeling efforts may be debated in some circles, the need for improved data analytic tools is unequivocal, and their applicability to the field is broad.

The first four chapters of this volume address some of the newer methodological approaches appearing in the literature of criminology. In addition, these advances are described and illustrated with specific reference to their criminological application.

The first chapter concerns panel models, an approach that employs data gathered both longitudinally and cross sectionally to permit causal

interpretations that neither of the two dimensions alone can provide. Building a multiwave panel model of crime rates and clearance rates, Greenberg and Kessler demonstrate how certain causal statements emerge that ordinarily are severely confounded in the usual longitudinal and cross-sectional analyses of deterrence.

The second contribution is devoted to a much discussed, often used, and sometimes misused and misunderstood approach—the log–linear model. Although often spoken of as if it were synonymous with one particular technique, the log–linear approach actually encompasses a number of analytic schemes, all involving models that are linear when they are expressed logarithmically. In this chapter Maxim describes and illustrates one particular log–linear approach to categorical data, demonstrating through a reanalysis of homicide data the array of possible hypotheses that become testable with this approach.

The next contribution reviews an approach to surveys of a sensitive nature that, although being eminently applicable to criminology, has had little exposure in the discipline. In particular, Tracy and Fox describe an array of survey designs, termed randomized response, that offer survey respondents the kind of protection that is essential in sensitive (and perhaps incriminating) inquiries but that still provide sufficient data analytic capabilities for the researcher.

Similar to the Tracy and Fox chapter, Bridges' contribution addresses the survey enterprise, but with particular focus on response errors and response bias. Combining a multiple indicator approach with a fairly complete measurement model, Bridges is able to estimate the extent and effects of inaccurate survey responses. Not only does this chapter illustrate the use of the Jöreskog approach to linear structural models, but, more important, it contrasts the usual tacit acceptance of data quality among researchers in this discipline.

In reviewing the first four chapters, one admonishment seems necessary. Too often in applied disciplines that borrow their methods from other fields, there is a tendency to embrace uncritically new methodological developments, that is, to view the new ways as the right ways and the old ways as the wrong ways. On the contrary, more traditional approaches, if used carefully and sensibly, can be more productive than the indiscriminate application of their alternatives. The next three chapters endorse this position, demonstrating how one basic tool (i.e., regression analysis) can be most fruitful if employed with restrained imagination.

The contribution by Maltz of a regression model of cigarette smuggling is elegant. Primarily, the appeal lies in its attention to theoretical reasoning and detail rather than to prolonged and complex technical dis-

cussions. Emphasizing that technique can hardly substitute for substance, the author's own remark deserves to be underscored: "Reasonable assumptions and approximations about the nature of a process can often be of greater utility in understanding the process than sophisticated analytic techniques."

Certainly, as regression methods have had increasing application in the literature, criminologists have grown more knowledgeable (if not wiser) regarding this staple technique. While many of the methodological pitfalls surrounding the use of regression are often noted in the criminological literature, seldom are remedial steps employed in practice. One such problem area is that associated with correlated regressors. Perhaps because multicollinearity among regressors does not produce bias in estimation procedures, some researchers feel little compulsion to be concerned. On the contrary, the deleterious effects of multicollinearity can indeed be substantial, as Fisher and Mason maintain in their contribution to the volume. Specifically, the authors give a comprehensive treatment of methods for detecting and handling multicollinearity. Clearly, their warning against ignoring the potential for poorly conditioned data cannot be overstated.

The next contribution highlights Maltz's earlier prescription for grounding analysis in a solid theoretical position. In particular, Barnett criticizes the atheoretical application of regression analysis evident in some recent deterrence research. Rather than passively maintaining the standard assumptions of regression, Barnett actively advances assumptions that arise from explicit propositions concerning criminal behavior. Certainly, the necessity of using theory to define limits of analysis—rather than the reverse—is a strong suggestion of this chapter.

Although many of the issues discussed in the previous three chapters can extend to longitudinal designs, their analyses focused on cross-sectional data. In contrast, the final two chapters specifically exhibit the use of time series data for forecasting and evaluation purposes. First, McPheters and Schlagenhauf provide a superb comparison of several methods of forecasting crime data. Illustrating various forecasting approaches with monthly volumes of burglary, robbery, and larceny, several recommendations emerge for the forecasting exercise.

Whereas applications to evaluation are only some of the uses of the forecasting techniques surveyed by McPheters and Schlagenhauf, the final chapter concerns an approach to time series data that is specifically tailored to evaluate program policy changes. After reviewing in a general way procedures for identifying and estimating stochastic models, Deutsch outlines how this approach to time series data can be extended for

estimating the effects of policy change or intervention. Combining step-by-step detail with an illustrative analysis of the effects of gun control legislation, this contribution offers a comprehensive treatment of this popular analytic approach.

My gratitude extends to all the contributors to this collection and its companion volume, *Models in Quantitative Criminology,* who have toiled to fulfill all my promises to the publisher concerning the outcome of this project. Moreover, I am indebted to the staff of Academic Press for its efforts.

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