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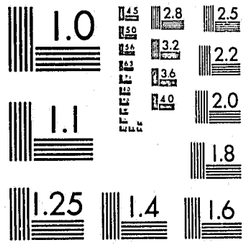

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Bibliography on Crime Forecasting and Related Topics

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(revised October 1983)

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Public-use tapes of BJS data sets and other criminal justice data are available from the Criminal Justice Archive and Information Network, P.O. Box 1248, Ann Arbor, Mich. 48106, (313/764-5199).

National Crime Survey

Criminal victimization in the U.S.:
1973-82 trends, NCJ-90541, 9/83

1980 (final report), NCJ-84015, 4/83
1979 (final report), NCJ-76710, 12/81

BJS bulletins:
Households touched by crime 1982, NCJ-86671, 6/83
Violent crime by strangers, NCJ-80829, 4/82
Crime and the elderly, NCJ-79614, 1/82
Measuring crime, NCJ-75710, 2/81

The National Crime Survey: Working papers, vol. I: Current and historical perspectives, NCJ-75374, 8/82
Crime against the elderly in 26 cities, NCJ-76706, 1/82
The Hispanic victim, NCJ-69261, 11/81
Issues in the measurement of crime, NCJ-74682, 10/81
Criminal victimization of California residents, 1974-77, NCJ-70944, 6/81
Restitution to victims of personal and household crimes, NCJ-72770, 5/81
Criminal victimization of New York State residents, 1974-77, NCJ-70944, 9/80
The cost of negligence: Losses from preventable household burglaries, NCJ-53527, 12/79
Rape victimization in 26 American cities, NCJ-55878, 8/79
Criminal victimization in urban schools, NCJ-56396, 8/79
Crime against persons in urban, suburban, and rural areas, NCJ-53551, 7/79
An introduction to the National Crime Survey, NCJ-43732, 4/78
Local victim surveys: A review of the issues, NCJ-39973, 8/77

National Prisoner Statistics

BJS bulletins:
Prisoners at midyear 1983, NCJ-91034, 10/83
Capital punishment 1982, NCJ-89395, 7/83
Prisoners in 1982, NCJ-87933, 4/83
Prisoners 1925-81, NCJ-85861, 12/82

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Capital punishment 1981 (final report), NCJ-86484, 5/83

1979 survey of inmates of State correctional facilities and 1979 census of State correctional facilities
Career patterns in crime (BJS special report), NCJ-88672, 6/83
BJS bulletins:
Prisoners and drugs, NCJ-87575, 3/83
Prisoners and alcohol, NCJ-86223, 1/83
Prisons and prisoners, NCJ-80697, 2/82
Veterans in prison, NCJ-79632, 11/81

Census of jails and survey of jail inmates:
Jail inmates 1982 (BJS bulletin), NCJ-87161, 2/83
Census of jails, 1978: Data for individual jails, vols. I-IV, Northeast, North Central, South, West, NCJ-72279-72282, 12/81
Profile of jail inmates, 1978, NCJ-65412, 2/81
Census of jails and survey of jail inmates, 1978, preliminary report, NCJ-55172, 5/79

Parole and probation

BJS bulletins:
Probation and parole 1982, NCJ-89874, 9/83
Setting prison terms, NCJ-76218, 8/83
Characteristics of persons entering parole during 1978 and 1979, NCJ-87243, 5/83
Characteristics of the parole population, 1978, NCJ-66479, 4/81
Parole in the U.S., 1979, NCJ-69562, 3/81

Courts

State court caseload statistics: 1977 and 1981 (BJS special report), NCJ-87587, 2/83
State court organization 1980, NCJ-76711, 7/82
State court model statistical dictionary, NCJ-62320, 9/80
A cross-city comparison of felony case processing, NCJ-55171, 7/79
Federal criminal sentencing: Perspectives of analysis and a design for research, NCJ-33683, 10/78
Variations in Federal criminal sentences, NCJ-33684, 10/78
Federal sentencing patterns: A study of geographical variations, NCJ-33685, 10/78
Predicting sentences in Federal courts: The feasibility of a national sentencing policy, NCJ-33686, 10/78
State and local prosecution and civil attorney systems, NCJ-41334, 7/78

Expenditure and employment

Justice expenditure and employment in the U.S., 1979 (final report), NCJ-87242, 12/83
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Expenditure and employment data for the criminal justice system, 1978, NCJ-66482, 7/81
Trends in expenditure and employment data for the criminal justice system, 1971-77, NCJ-57463, 1/80

Privacy and security

Computer crime:
Computer security techniques, NCJ-84049, 9/82
Electronic fund transfer systems and crime, NCJ-83736, 9/82
Legislative resource manual, NCJ-78890, 9/81
Expert witness manual, NCJ-77927, 9/81
Criminal justice, NCJ-61550, 12/79

Privacy and security of criminal history information:
A guide to research and statistical use, NCJ-69790, 5/81
A guide to dissemination, NCJ-40000, 1/79
Compendium of State legislation: NCJ-48981, 7/78
1981 supplement, NCJ-79652, 3/82

Criminal justice information policy:
Research access to criminal justice data, NCJ-84154, 2/83
Privacy and juvenile justice records, NCJ-84152, 1/83
Survey of State laws (BJS bulletin), NCJ-80836, 6/82
Privacy and the private employer, NCJ-79651, 11/81

General

Report to the nation on crime and justice: The data, NCJ-87068, 10/83
1983 directory of automated criminal justice information systems, NCJ-89425, 10/83
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Violent crime in the U.S. (White House briefing book), NCJ-79741, 6/82
Federal justice statistics (BJS bulletin), NCJ-80814, 3/82
Dictionary of criminal justice data terminology: Terms and definitions proposed for interstate and national data collection and exchange, 2nd ed., NCJ-76939, 2/82
Correctional data analysis systems, NCJ-76940, 8/81
Technical standards for machine-readable data supplied to BJS, NCJ-75318, 6/81
Justice agencies in the U.S., 1980, NCJ-65560, 1/81
Indicators of crime and criminal justice: Quantitative studies, NCJ-62349, 1/81
A style manual for machine-readable data, NCJ-62766, 9/80
Myths and realities about crime, NCJ-46249, 10/78

BJS mailing lists:

BJS Bulletin — timely reports of the most current justice data

Corrections reports — results of sample surveys and censuses of jails, prisons, parole, probation, and other corrections data

Court reports — State court caseload surveys, model annual State court reports, State court organization surveys

National Crime Survey — the Nation's only regular national survey of crime victims

Sourcebook of Criminal Justice Statistics — a broad spectrum of data from 153 sources in an easy-to-use, comprehensive format (433 tables, 103 figures, index)

All BJS reports — 25 to 35 publications a year (includes all of the above)

To be added to these lists, write to the National Criminal Justice Reference Service, User Services Dept. 2, Box 6000, Rockville, Md. 20850.

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Bibliography on Crime Forecasting and Related Topics

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Funding for this research was provided by Grant No. 82-BJ-CX-K420 to the Justice Center, University of Alaska, Anchorage, from the Bureau of Justice Statistics. Points of view or opinions stated in this document are those of the authors and do not necessarily represent the official position or policies of the Bureau of Justice Statistics.

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PREFACE

Forecasting techniques have been used for decades in both the public and private sectors. On the federal level, models of the national economy have helped to shape monetary and fiscal policy. In the private sector, forecasts of series such as sales and inventory have reduced uncertainty of management. In criminal justice, prison population forecasts began being used during the 1970's. As we emerge into the 1980's, crime forecasting is being evaluated as to its potential usefulness.

Crime forecasts can be useful to criminal justice planners in a number of ways. In regard to long term planning, models for forecasting crime could be of service for those who need to anticipate the construction of law enforcement and correctional facilities, or the training of highly skilled personnel in specialized fields, e.g., forensics science. In addition, knowing about the future (for example, knowing that crime will not continue to increase in the next ten years) allows law enforcement adminis-trators lead time to begin preparing for anticipated budget cuts. Models that include social and economic indicators as predictors of crime may also generate the costs and benefits of long range policies in areas other than criminal justice.

Crime forecasting with shorter time horizons is likely to be most useful to planners at the local and state level; such problem centered information enables one to anticipate the level of resources required and to allocate existing resources efficiently. For example, location specific predictions of crime by

type could be helpful in assigning the manpower of a law enforcement agency to different regions of the state or different areas of the city. Additionally, patrol routes could be set according to weekly or monthly crime forecasts. Furthermore, knowing monthly rates of crime for specific areas of a law enforcement jurisdiction could be useful in scheduling vacation time and in buying gasoline for patrol cars.

Community based crime prevention is another policy area that can benefit from short term problem centered forecasts. For example, in the mid 1970's, the New Orleans Police Department issued two week crime probability forecasts of specific crime in specific police districts to alert residents and businesses (Crime Control Digest, 1975). Future crime estimates by type and location could also be made available to citizen groups interested in working with the police.

The foregoing discussion has focused on uses of crime forecasts for the purposes of problem identification. That is, results help define the specificity of the problem, i.e., type, location, time horizon, etc., but there is no information provided on what alternative policies are more likely to reduce the crime problem. Forecasting based on policy grounded theory can provide this information. For example, some forecasting methods yield crime estimates that are predicted, not from previous crime data, but from a variety of other independent variables such as police expenditures, prison admissions, unemployment, and risk population estimates. In these instances, future crime estimates are produced as well as information on the causes of crime. With

this additional data on crime causal factors, the administrator can begin to formulate policy or programs that can impact the cause of crime, like unemployment in particular areas; and, in return can expect a reduction in the crime problem.

A final policy area in which crime forecasts can be useful is the evaluation of crime control and prevention programs. Forecasting can be used as an evaluative tool in two ways. First, an intervention analysis might involve the evaluation of a proposed change in a specific policy, such as the reallocation of effort to combat a particular type of crime. A technique like Box-Jenkins time series could provide information on the potential impact of alternative policies and/or programming before the change has been implemented. Second, in cases where there is no control group for evaluating an alternative policy, a post hoc intervention analysis can generate crime forecasts based on preintervention data. These results can predict a crime pattern which would stimulate a decision not to implement the alternative policy.

Since forecasting has only recently been introduced to criminal justice as a planning tool, the "state of the art" has yet to be established. Toward this end, the following bibliography includes one of the most comprehensive listings of crime forecasting works available, and, in addition, presents an extensive listing of closely related topics. It is one of the major products of a project funded by the Bureau of Justice Statistics to the Alaska Department of Public Safety. This larger project, entitled Crime and Arrest Rate Predictions for the States of Alaska and Oregon, centered on piloting a multiple method

approach to forecasting crime at the state level. The bibliography introduction includes information about the format and content of this bibliography, along with the methods and procedures used to locate relevant citations.

It is important to give special acknowledgment to the Project Advisory Group, James Fox, Clinton Goff and Robert Willstadter, who assisted in several reviews of our draft materials. We are grateful for their suggestions and input and feel that their contribution is worthy of collaborating authorship.

We also wish to thank Jos Mapranath, the Director of Administrative Services, Department of Public Safety in Alaska and John Jones of the Bureau of Justice Statistics, for their encouragement and responsiveness as state and federal Project Monitors. Special thanks is extended to Phyl Booth who was responsible for formatting, typing and organizing the Bibliography. Editorial assistance provided by Darline Creen and administrative support of Jane Barcott should also be acknowledged. Finally, we appreciate the responsiveness of the National Criminal Justice Reference Service, the Directors of state Statistical Analysis Centers, and the Uniform Crime Reporting Program who provided us with reference material and unpublished documents.

August 1983

Knowlton Johnson

Janet Eidson

INTRODUCTION

Format and Content

In Section I of the bibliography, literature is presented that shows the development of crime-related forecasting. This is a comprehensive and exhaustive listing of crime and arrest forecasting work with most of the documents abstracted. Of the 55 citations addressing crime-related forecasting, 34 concern discussions of empirical forecasting studies; and of these, 30 center specifically on crime and/or arrest forecasting. The remaining work deals mostly with theoretical and methodological issues associated with crime forecasting.

In regard to the time frame of the 55 crime forecasting related citations, only two pre-1970 listings were found, neither one a crime forecasting study. In 1976 an increasing number of crime-related forecasting works began to appear; from 1976 through 1979 30 citations were uncovered. Most of these studies centered on forecasting vis-a-vis regression, structural equation techniques and Box-Jenkins time series analysis, both in the U.S.A. and other countries. With the emergence of the 1980s came new developments and controversy in the area of crime forecasting. Fifteen citations appeared during the 1980-82 period.

Twenty-six of the 30 crime forecasting empirical studies are also indexed according to type of analytical forecasting method and the unit of analysis. The original document for the remaining four studies could not be located. These indexes enable readers to identify those studies which used cities,

states, the nation or foreign countries as the basis of their forecasts and what mathematical method they used to arrive at their forecasts, i.e., regression, Box-Jenkins, etc.

In an effort to uncover crime and arrest forecasting works, we discovered many practitioners in the criminal justice field had a strong interest in prisoner and inmate population forecasting. Budget and manpower allocations are often based on such projections, and in this era of prison overcrowding and court ordered minimum of prisoner living space such studies are increasingly valuable. Because of this increasing importance, Section II presents "Prison Population Forecasting" citations. Included are the more current literature on the subject and many unpublished documents from state governments.

Section III traces the development of the Uniform Crime Report System in the United States, as well as presenting publications that deal with issues in the use of such statistics and the use of criminal statistics in other countries. This section provides an illustrative but not exhaustive list of literature on the history of crime indicators.

In Section IV, an illustrative listing of crime causation literature is presented. Crime causation work is too numerous to present in any comprehensive manner. Instead, we present illustrative causation literature, most of which was used in our forecasting project. This listing concerns only theoretical and empirical work concerning explanations of the level of crime, not individual criminality. Additionally, this listing is divided

according to the major sets of theories that have influenced crime forecasting works. These include economic ecology, deterrence, opportunity, social disorganization, and demographic theories.

Section V, Social Forecasting Methodology, is included as a sampling of forecasting "basics." Prediction studies are used throughout the social science field with a great deal of respectability. With its growth as an accepted practice, problems and refinements have developed that can be applied to forecasting in the criminal justice field as well as in other areas. This section is only intended to serve as a guide for those practitioners interested in the technicalities of conducting forecasting studies.

Methods and Procedures

The primary method employed in the creation of the bibliography was the use of DIALOG Information Retrieval Service, available through the University of Alaska, Anchorage Library. DIALOG is a computerized bibliographic data base which allows easy access to a wide range of data bases. Through contract agreement, DIALOG references all the citations and abstracts provided by such traditional services as Sociological Abstracts. It can perform system searches quickly, and is far more efficient, both in terms of cost and time, than searching such data bases by hand. For approximately $300, we received over a thousand possible citations for consideration in compiling this bibliography.

The first step in using DIALOG was to identify those data bases which would be appropriate, i.e., those which might conceivably include publications dealing with crime and arrest forecasting. The following data bases were so identified:

Legal Resource Index (LRI)
Criminal Justice Periodicals Index (CJPI)
Sociological Abstracts (SocAb)
Social Science Citation Index (SSCI)
Conference Papers Index
Dissertation Abstrcts
Foundation Grants Index
National Technical Information Service (NTIS)
National Institute of Justice - National Criminal Justice Reference Service (NIJ-NCJRS)

The second step involved indentifying "key words" or phrases with which to search each individual data base. Some of these bases index publications according to title; others use pertinent content or abstract phrases and some use both. Identifying the correct key words for each data base increased efficiency, avoided duplications and irrelevant publications, and kept costs down.

Obtaining a search of the National Institute of Justice-National Criminal Justice Reference Service (NIJ-NCJRS) was made more efficient and cost objective by going directly to NIJ-NCJRS. The NIJ-NCJRS is an international clearinghouse of information on law enforcement, criminal justice and juvenile justice. It draws on a great variety of sources for its data base - publications, film, speeches, etc. - and has many services available to researchers. NIJ-NCJRS will perform reference searches, help in identifying appropriate key-words for a search and suggest other possible sources. Many documents referenced by NIJ-NCJRS are available from commercial publishing houses, the National

Technical Information Service or the U.S. Governmnent Printing Office. In addition, most documents are available from NIJ-NCJRS through interlibrary loan. Many documents are also available from NIJ-NCJRS through their microfiche program. In this program, they provide requesters with single free microfiche copies of documents.

The NIJ-NCJRS provides not only citations of relevant material, but also abstracts of the documents. The abstracts are very complete and useful. In Section I, Crime and Arrest Forecasting, several of NIJ-NCJRS's abstracts were modified for our bibliography. These modified abstracts are so indicated by having "NIJ-NCJRS" appear in parentheses at the end of the abstract.

The citations that were gathered were sorted for relevance and content. Those selected were catalogued and every effort was made to try to obtain the original publication through resources at the University Library or thrcugh Inter-Library Loan, connecting the UAA Library with libraries all across the country. In addition, references used by the authors of all the articles reviewed were examined for publications that our searches may have missed. Finally, the National Forecasting Survey, which was responded to by Statistical Analysis Center directors as well as directors of Uniform Crime Report Programs in 48 states, the District of Columbia and Puerto Rico, revealed unpublished crime forecasting related documents.

SECTION I

CRIME FORECASTING*

ANDERSON, F.
1976 Changes in the Distribution of Population and Its Effects Upon Arrests. Richmond, VA: Virginia Division of Justice and Crime Prevention.

This study examines the impact of population growth (particularly the crime-prone age group 13 - 29) on crime rates. Crime rates are highly correlated with the crime-prone age group and it is predicted that 1976 will see a downward trend in crime that is expected to continue. Other inflationary factors impacting crime, such as unemployment, are also discussed. (NIJ - NCJRS)

1977 Crime and Arrest Rate Projections for the State and the Nation, 1976-1980. Richmond, VA: Virginia Division of Justice and Crime Prevention Statistical Analysis Center. [A1,3; B1]

This paper shows that the rise in crime since 1960 corresponds precisely with the rise in the number of persons aged 15 through 29, the most crime prone ages. The author presents the technique used for making crime projections based on this population age group and forecasts crime rates for Virginia and the nation for 1976 to 1980 and beyond.

BRENNER, M. HARVEY
1979 "Book Review of Fox." Journal of Criminal Law and Criminology 70(2):273-74.

Brenner feels, in this review of James Fox (Forecasting Crime Data, 1978), that Mr. Fox's book is largely irrelevant for research workers in criminology. No real explanation of econometric models appears, nor any comparison of models, and Brenner believes this limits the usefulness of the volume. In addition, Brenner takes argument with Fox's determination that the unemployment rate has no impact on the crime rate.

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* INDEX to Crime Forecasting studies only:

A - Unit of Analysis: 1=nation; 2=city; 3=state; 4=foreign.

B - Analytical Method: 1=regression; 2=time-series; 3=straight line projection; 4=system dynamic model; 5=smoothing; 6=cross-spectral analysis; 7=diffusion model.

CALIFORNIA BUREAU OF CRIMINAL STATISTICS
1974 Crime and Delinquency in California, 1974. California: Division of Law Enforcement, Department of Justice. [A3; B3]

Brief crime/arrest forecast included in report.

CALIFORNIA INSTITUTE OF TECHNOLOGY JET PROPULSION LABORATORY
1971 Crime Prediction Modeling - Final Report. Washington, D.C.: National Aeronautics and Space Administration. [A2; B2]

This study presents various techniques for crime prediction and discusses the usefulness of the alternatives, functional forms, parameter estimation techniques and the quality of the resultant predictions. An extrapolative technique was employed to predict crime in the city of Los Angeles as part of an evaluation of the use of police helicopters as patrol vehicles. (NIJ - NCJRS)

COHEN, LAWRENCE E.
1981 "Modeling Crime Trends - A Criminal Opportunity Perspective." Journal of Research in Crime and Delinquency 18(1):138-64. [A1; B1]

This article models trends in reported robbery, burglary, larceny and auto theft. A "criminal opportunity perspective" is used to formulate several social production functions for these crime rate trends, showing how relatively moderate social changes - such as the participation of women in the labor force, presence of lightweight durable goods and increases in the number of people living alone - can generate dramatic increments in the crime rates. (NIJ - NCJRS)

COHEN, LAWRENCE E.; FELSON, M.; and LAND, K.C.
1980 "Property Crime Rates in the United Sates - A Macro Macrodynamic Analysis, 1947-1977 - With Ex Ante Forecasts for the Mid-1980's." American Journal of Sociology 86(1):90-118. [A1; B1]

This article develops several macrodynamic social indicator models of post-World War II property crime trends. The theory presented suggests that a decrease in the density of the population in physical locations which are normally the sites of primary groups' routine activities - family patterns in a household - could produce an increase in criminal opportunities and hence in property crime rates. Forecasts based on the model indicate that robbery and auto thefts should drop in the 1980's, but burglary rates should continue to grow or drop less. (NIJ - NCJRS)

CONNECTICUT, OFFICE OF THE GOVERNOR
1982 Crime Trends in Connecticut. Justice Planning Division, Office Policy and Management, Budget Division. Connecticut (March). [A2,3; B1]

Brief crime/arrest forecast included in report.

COUNCIL OF EUROPE LIBRARIE BERGER-LEVRAULT
1974 Methods of Forecasting Trends in Criminality. Strasbourg, France.

This report discusses the forecasting methods used by France, Scandinavia and the United Kingdom. A forecasting method classification scheme is presented and the study recommends that all member states of the Council of Europe utilize some type of crime forecasting technique. (NIJ - NCJRS)

CRIME CONTROL DIGEST
1975 "NOPD Gives Crime Forecasts." Crime Control Digest, 9(28):5-6.

Brief press release stating that the New Orleans Police Department issues two week "crime probability forecasts" for specific crimes in specific police districts to alert residents and businesses and increase community cooperation in guarding against crime.

DALLEY, A.F.
1977 "Use of Modelling Techniques as Crime Predictors - An Assessment." International Criminal Police Review, 32(312):278-89.

This paper explores several modeling techniques used by social scientists in the prediction of crime. The strengths and weaknesses of each technique are pointed out, and the author recommends that the simpler methods of averages and linear equations provide sufficient and accurate long-range predictions. (NIJ - NCJRS)

DECKER, S. and KOHFELD, C.
1982 "Fox Reexamined: A Research Note Examining the Perils of Quantification." Journal of Research in Crime and Delinquency 19:110-21.

In this research note, the authors discuss general problems encountered in quantitative analysis and specific problems they feel apply to James A. Fox (Forecasting Crime Data, 1978). They suggest problems relating to (1) aggregation, (2) causal variables and time precedence, (3) regressor

independence, (4) autocorrelated error, and (5) the omission from the model of crucial variables. In particular, they find that Fox's use of the Consumer Price Index for an economic predictor of crime to be inappropriate.

1982 "Reply to Fox." Journal of Research in Crime and Delinquency 19:132-34.

DELAWARE STATISTICAL ANALYSIS CENTER
1982 Prison Populations and Arrests. Delaware: Governor's Commission on Criminal Justice (December). [A3; B2]

Brief crime/arrest forecast included in report.

DEUTSCH, STUART JAY
1978 "Stochastic Models of Crime Rates." International Journal of Comparable and Applied Criminal Justice (2):128-51. [A2; B2]

In this study, Deutsch describes and illustrates a Box-Jenkins time-series model for crime occurrences in ten U.S. cities. The model is then applied to forecasting future crime in two of these cities with accuracy above 90%.

DEUTSCH, S.J.; JARVIS, J.J.; and PARKER, R.G.
1979 "Network Flow Model for Forecasting and Evaluating Criminal Displacement." Evaluation Quarterly 3(2):219-35. [A2; B4]

This study is a technical account of the construction and application of a model that describes patterns of crime displacement - the occurrence of crimes in areas other than areas in which the perpetrators reside. The model includes crime/victim data, socioeconomic data, and geographical data. Using an example of Atlanta, GA, the model predicts a significant trend toward the commission of crimes in the inner city by suburban residents. (NIJ - NCJRS)

DISTRICT OF COLUMBIA OFFICE OF PLANNING AND PROGRAM ANALYSIS
1982 A Study of Criminal Justice System Trends Affecting the District of Columbia's Department of Corrections Population from 1978 to 1981, with Projections through 1984. Washington, D.C.: Department of Corrections (September). [A3; B3]

Brief crime/arrest forecast included in report.

FOX, J.A.

1976 Econometric Analysis of Crime Data. Doctoral Dissertation, University of Pennsylvania. [A1; B1]

A mathematical model using econometric techniques is developed to explain and predict trends in crime rates and related variables. The crime trend was most significantly related to the consumer price index with age composition of the population accounting for fluctuations. A general upward trend, with fluctuations, through the year 2,000, is predicted. (NIJ - NCJRS)

1978a Forecasting Crime Data - An Econometric Analysis. Lexington, MA: Heath Lexington Books. [A1; B1]

This is an expanded study of Econometric Analysis of Crime Data (Fox, 1976). A simultaneous equation model is presented of national crime trends with forecasts through the year 2000. Results, with the Consumer Price Index and age distributions used as prime predictors, show a general reduction in the upward trend in crime rates during the 1980's and an increase during the 1990's. Race disribution and birth rates are also discussed. (NIJ - NCJRS)

1978b "Generations and the Generation of Crime." Virginia Law Weekly 31(1):1-4.

Drawing on his work in Forecasting Crime Data (Fox, 1978), Fox presents a discussion of the "baby boom" and consequent use in violent crime. Because the baby boom generated a larger group of 14- to 21-year-olds, a group with a greater than average propensity toward committing crime, Americans saw the crime rate escalate in the 60's and early 70's. Now that this cohort of baby boom children is aging, crime, especially violent crime, will naturally go down. Policies of police, judges or prosecutors cannot be credited - or blamed - for these changes in the crime rate. It is suggested that as this birth cohort ages there may be increases in "adult" crimes, i.e., embezzlement, fraud, graft or computer theft. As the baby boom cohort have children of their own, there should be a slight increase in the violent crime rate in the 90's. Barring any great wars, depressions or disasters, however, the birth rates and crime rates will both even out and remain fairly steady: the "crime wave" of the 60's is over.

1981 "Forecasts of Crime Rates and Their Relation to Demographic and Economic Indicators." U.S. House of Representatives Subcommittee on Crime Hearing on the American Crime Problem (June 10, 1981).

1982 "A Reply to Decker and Kohfeld - Reexamining Some Perils of Quantification in the Econometric Study of Crime." Journal of Research in Crime and Delinquency 19:122-31.

In this article, Fox answers issues brought up by Decker and Kohfeld (1982) concerning suggested problems in his work, Forecasting Crime Data - An Econometric Analysis (1978). Fox addresses the arguments dealing with aggregation and specification, the use of the Consumer Price Index rather than the unemployment rate, and time trends in time series data.

FORST, B.E.

1973 "Crime Prediction Within and Between Police Jurisdictions." 44th National Meeting of Operations Research Society of America, San Diego, CA, Nov. 12-14.

FREEDY, A. and WELTMAN, G.

1973 "Application of a Learning Computer System to Help Predict and Prevent Crimes" from Carnahan Conference on Electronic Crime Countermeasures, 1973 - Proceedings, J.S. Jackson and R.W. Devore. New York, NY: Institute of Electrical and Electronics Engineers.

This study presents a description of the development, operation and appreciation of an adaptive decision-aiding concept in which a human decision-maker is aided by a trainable, computer parallel decision-maker. The author then describes how this type of model is suitable for crime prediction. (NIJ - NCJRS)

GLADSTONE, F.

1979 "Crime and the Crystal Ball." Home Office Research Bulletin 7:36-41. London, England.

This study is a discussion of the most common kind of social forecasting, the extrapolation of existing trends. In applying this technique to crime rates, the social consequences of demographic change, especially changes in the number of young males aged 17 to 20 must be accounted for to achieve valid forecasts. Other factors affecting the crime rate, such as unemployment, affluence, birth rates and crime reporting, are also discussed. (NIJ - NCJRS)

GOLDMAN, JERRY; HOOPER, RICHARD; and MAHAFFEY, JUDY
1976 "Caseload Forecasting Models for Federal District Courts." The Journal of Legal Studies 5(2):201-242.

Testing two types of models, indicator-based regression model and a time-series or autoregressive model, the authors describe in detail efforts to forecast caseloads for the U.S. District Courts. A total of 158 general, civil and criminal indicators were originally analyzed in the regression model. The time-series model was based on the number of past court filings, and in every case the indicator-based models were superior to the time-series in terms of utility and goodness of fit. The most predictive indicators appeared to be economic measures, number of lawyers in the population and federal budget data. Arrest indicators were not significant.

HASENPUSCH, B.
1978 "Rise and Fall of Crime in Canada - An Attempt at Criminological Forecasting." Crime ET/And Justice 6(2):108-123. [A4; B1]

This article presents an introduction to criminological forecasting in general and to previous forecasting efforts in Canada. Multiple regression analysis of reported crime and demographic factors suggests that while total crime reported to police and the number of violent crimes in Canada will continue to rise, property crimes will decrease for the projections 1977-1982. (NIJ - NCJRS)

1979 "Future Trends of Crime in Canada." Canadian Police College Journal 3(2):89-114. [A4; B1]

The results of a crime trend forecast for the years 1978 to 1984 are examined in conjunction with past Canadian forecasts and forecasting methods in general. Results suggest a slow increase in total offenses and homicides, woundings and theft, with a leveling off of breakins and a decrease in rapes, assaults, auto thefts and frauds. (NIJ - NCJRS)

HELLER, NELSON B. and MARKLAND, ROBERT E.
1970 "A Climatological Model for Forecasting the Demand for Police Service." Journal of Research in Crime and Delinquency 7(2):167-76.

Weekly demand for police service is forecasted for St. Louis, Chicago and Detroit. The authors report forecasting errors of very close to zero, with the most significant variable being the weekly average temperature.

IOWA STATISTICAL ANALYSIS CENTER
1979 Crime and Arrest Patterns, Vol. II of Crime and Criminal Justice in Iowa. Office for Planning and Programming, State of Iowa. [A3; B3]

Crime/arrest forecasts included in report.

JEPSEN J. and PAL, L.
1966 "Forecasting the Volume and Structure of Future Criminality," in European Committee on Crime Problems Collected Studies in Criminological Research, Vol. IV, Strasbourg: Council of Europe.

JONES, LANDEN Y.
1980 "The Crime Boom" Chapter 11 in Great Expectations: America and the Baby Boom Generation. New York: Coward, McCann and Geoghegan.

KENNEDY, J.B.
1978 "Forecasting Methods in Criminology." Quarterly 34(4) - 35(1)(Dec-Mar):28-33. Pennsylvania Association on Probation, Parole and Correction, Camp Hill, PA.

Application of statistical forecasting methods in criminality are briefly reviewed in this article. Common applications of these methods, their data requirements, forecasting ability and the situations each is best suited for are discussed. Forecasting crime, police demand and seasonality of crime are also discussed. (NIJ - NCJRS)

KLEPINGER, D.; WEIS, J.; and STARK, R.
1979 "Projecting Arrest Trends: An Age, Period and Cohort Model." Draft Document, Center for Law and Justice, University of Washington, Seattle, WA.

KUBE, E.
1976 "What's Happening in the Area of Crime Prognosis?" Kiminalistik (3)8:350-55.

This paper reviews the basic applications of crime rate prediction to police work as conceived by the West German police and briefly summarizes the experiences of Canada, Sweden, Japan, and West Germany in this field. It concludes that crime rate prediction is still based more on experience and intuition than on scientific methods. (NIJ - NCJRS)

KURUSU, M.; OKUSAWA, Y.; SHINDO, H.; SATO, T.; KATSURAJIMA, M.; and TOKUYAMA, T.
1976 "Estimation of Crime Rate Based on Socio-Economic Indices - Second Interim Report - An Approach by Time-Series Analysis." Tokyo, Japan: Japan Ministry of Justice Research and Training Institute. [A4; B1]

This study relates eight socioeconomic factors to specific crimes over 5-year periods to determine whether correlations are simultaneous and constant or lagged. The correlation was found to vary according to the length of time a particular socioeconomic trend was prevalent and suggests that predicting the incidence of a particular crime needs careful consideration on which socioeconomic factor should be adopted for each year. (NIJ - NCJRS)

LAND, KENNETH C. and MARCUS FELSON
1976 "A General Framework for Building Dynamic Macro Social Indicator Models: Including an Analysis of Changes in Crime Rates and Police Expenditures." American Journal of Sociology (82)3:565-604. [A1; B1]

This analysis presents (1) an opportunity-structures framework for generating equations of dynamic macro social indicator models; (2) a demographic accounting framework for establishing population stocks and flows; and (3) a structural equation strategy for estimating and evaluating the resulting models. As illustrations, three equations determining changes in property crime rates, violent crime rates and public police expenditures are included. These models were estimated for a period from 1947 to 1972 and forecasts presented for 1973. The property crime rate equations had inflation and prosperity indices as their most significant variables with police expenditures entering strongly negative. Estimating the equation for violent crime, however, showed that inflation, unemployment and age-structure variables all had negligible influence and an equation with just police expenditures, reported violent crime and reported property crime worked well.

LE BLANC, M.
1974 "Forecasting Juvenile Delinquency," from Project Search International Symposium on Criminal Justice Information and Statistics Systems Proceedings, E. Cresswell. Sacramento, CA: Search Group, Inc. [A4; B3]

This study compares various juvenile delinquency forecasting methods and explains the ARIMA method of forecasting. In its application here, however, ARIMA failed to show long-

range forecasting capabilities and did not retain the cyclical variation of delinquency. (NIJ - NCJRS)

LESTER, D.
1978 "Predicting Murder Rates of Police Officers in Urban Areas." Police Law Quarterly 7(3):20-25.

This study attempts to predict murder rates of police officers, by civilians, for urban areas. Demographic and environmental variables along with crime rates and police statistics were correlated with police murder figures for the cities analyzed. The proportion of blacks in the city, the proportion of people below the poverty line and having a high crime index were moderately significant. The author suggests that variables within the police structure, such as age, training and racial structure, might be more significantly related to police murder rates, but that such data are difficult to obtain. (NIJ - NCJRS)

MC MASTER, D.J.; O'LEARY, M.K.; and COPLIN, W.D.
1979 "Testing Two Methods of Short-Term Forecasting of Political Violence." Technological Forecasting and Social Change 14:115-33.

In an effort to aid foreign policy decision making, the authors have created two forecasting models to predict political violence. Argentina, Ethiopia and Thailand were chosen as test subjects and monthly data from diplomatic reporting and surveys of specialists were gathered for a 6 - month period. It was concluded that the techniques and models employed were successful and that further investigation would be useful.

MC PHETERS, L.R. and SCHLAGENHAUF, D.E.
1979 "Forecasting Reported Crime Data - Some Tests of Alternative Models" from Criminal Justice Statistics Association, Inc. Proceedings. Washington, D.C. [A2; B2,3,5]

The paper describes and rates three different forecasting models which might be appropriate for medium-sized cities with limited resources. It suggests that (1) elaborate models are not always necessary, and (2) the most likely type of intuitive forecast undertaken by an experienced police administrator would probably yield a cost-effective forecast. (NIJ - NCJRS)

1981 "Evaluation of Alternative Crime Forecasting Models," in Methods in Quantitative Criminology, ed. James Alan Fox, New York: Academic Press, pp. 147-70.

This article evaluates four alternative short range crime forecasting models. These models are: Naive, Extrapolative, Holt-Winters Exponential Smoothing, and Box-Jenkins Forecasting Models. All four models are then applied to the same data set. Box-Jenkins was easily the most accurate of the methods, with the naive and extrapolative models being least accurate. The actual choice of a forecasting model for use by a police department, however, depends on the amount of crime there is to forecast, and the resources available to use in developing the models. For some departments, especially small ones, the most accurate techniques may not be the most cost effective.

MISSISSIPPI CRIMINAL JUSTICE PLANNING COMMISSION
1979 FY 1979 Comprehensive Plan. State of Mississippi. [A3; B1]

Brief crime/arrest forecast included in report.

MONTANA CRIMINAL JUSTICE DATA CENTER
1977 Crime in Montana - Annual Report, 1976. Helena, MT: Montana Criminal Justice Data Center. [A3; B1]

This report includes a statistical analysis of the number and types of crime, a projection of how much crime may be expected in the future and a summary of arrests, criminal court proceedings and prison admissions. (NIJ - NCJRS)

NOBLE, R.
1977 "Feedback, Instability and Crime Waves." Journal of Research in Crime and Delinquency 14(Apr):107-128.

ORSAGH, THOMAS
1980 "Unemployment and Crime: An Objection to Professor Brenner's View." Journal of Criminal Law and Criminology 71(2):181-83.

This comment takes issue with Harvey M. Brenner's book review of Forecasting Crime Data, 1978, by James Fox (Brenner, J. of Criminal Law & Criminology 70(2):273-74). Orsagh devotes his rebuttal to the issue of whether or not the unemployment rate has an effect on crime and he cites many studies to show that it does not.

PENNSYLVANIA COMMISSION ON CRIME AND DELINQUENCY
1980 Analysis of the Adequacy of Our Current State Correctional Facilities: Now and in the Future January 1980. Executive Office, State of Pennsylvania.

Brief crime/arrest forecast included in report.

PRESIDENT'S COMMISSION ON LAW ENFORCEMENT AND ADMINISTRATION OF JUSTICE
1967 "Projected Percentage of U.S. Population with Criminal Arrest and Conviction Records." Task Force Report: Science and Technology, pp. 216-28. Washington, D.C.: Government Printing Office.

This paper presents projections of the percentages of U.S. population which will have a criminal record (non-traffic arrest) and the percentage which will have a conviction resulting from such an arrest. The predictions were made based on the assumptions that current situations (i.e., current age-specific arrest probabilities) will continue on into the future.

SAGI, PHILIP C.
n.d. "Projections of Arrests in the United States, 1975-2000." Unpublished manuscript, Department of Sociology, University of Pennsylvania.

SEPLER, H.J.
1979 "Next Twenty-Five Years Facing the Criminal Justice System - Using Standard Celeration Charting For Systems Analysis." American Journal of Criminal Law 7(1):47-66. [A1; B1]

A standard celeration charting (SCC) method for system analysis is applied to the criminal justice system in this paper. SCC is extensively described and presented as a rapid, easily interpreted and inexpensive way to examine and predict protective, rehabilitative and judicial services as well as juvenile delinquency arrests and court cases. (NIJ - NCJRS)

STEVENS, P.
1979 "Predicting Black Crime - Great Britain." Home Office Research Bulletin (London, England) 8:14-17.

This article examines the number of blacks represented in the 15 to 24-year-old age group and unemployed population of London and correlates it with the number of blacks arrested.

It predicts rapid escalation of young, unemployed blacks, and accordingly, escalation of the number of blacks arrested and convicted. (NIJ - NCJRS) [A4; B1]

TRACY, G.S.; PHIFER, J.A.; HADDER, G., and MILLER, R.S.
1979 "Building a Simulation Model to Assess Costs of Alternative Policies and Procedures in a Department of Corrections" from Criminal Justice Statistics Association, Inc. Proceedings, 1979.

This research indicates that a crime slope is a more consistent and useful indicator of crime trends than is the crime rate. Because the number of index crimes has a linear relationship with the exponential growth in population, the authors suggest using crime slope and intercept methodology to produce a crime trend indicator that is statistically useful for comparisons. (NIJ - NCJRS)

VIGDERHOUS, G.
1978 "Cyclical Variations of Monthly and Yearly Homicide Rates in the United States and Their Relationship to Changes in the Unemployment Rate," from Quantitative Studies in Criminology, Charles Wellford. Beverly Hills, CA: Sage Publications. [A1; B6]

This article combines spectral analysis and the autoregressive moving average (ARMA) methodologies to examine the statistical relationship between two stationary time series: seasonally adjusted unemployment rates for males aged 20 to 24 and monthly data on homicide rates for 1963-1974. This demonstrates a useful method for identifying socioeconomic and demographic factors which explain temporal variations in homicide rates. The author then sugests applications for developing forecasting models. (NIJ - NCJRS)

WASHINGTON, STATE OF
1980 Crime Prediction for Washington State. Washington Office of Financial Management, Statistical Analysis Center. Olympia, WA: State of Washington. [A3; B7]

This study predicts total crime, violent crime and property crime for Washington state to the year 2000, taking into account the future number of males aged 15 to 34. It suggests that crime rates have stabilized since 1974 and will remain so unless social change of the magnitude of that of the late 1960's recurs. (NIJ - NCJRS)

WELLER, D.
1979 Forecasting Crime Rates - A Review of the Available Methodology. Stanford, CA: Hoover Institution Center for Econometic Studies of the Justice System.

This paper discusses issues involved in forecasting the incidence of crime, the variety of approaches used to produce forecasts and the literature dealing with these methods. The author suggests that extrapolation by means of one of the univariate methods would be most appropriate for generating short-term forecasts at a reasonable cost and that coherent theoretical models offer the possibility of long-term forecasts. (NIJ - NCJRS)

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1978 The Art and Methods of Criminal Justice Forecasting. Doctoral Dissertation Sam Houston State University.

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1980 "Demographically Disaggregated Projections of Prison Populations." Journal of Criminal Justice 8:1-26.

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1978 "Demographically Disaggregated Projections of Prison Populations." Urban Systems Institute, Carnegie-Mellon University, School of Urban and Public Affairs. Pittsburgh, PA.

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1976 "The Dynamics of a Homeostatic Punishment Process." Journal of Criminal Law and Criminology 68:317-34.

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1980 "Growing or Stable Incarceration Rates: A Comment on Cahalan's 'Trends in Incarceration in the United States Since 1880's.'" Crime and Delinquency 26(Jan):91-94.

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1979 "Trends in Incarceration in the United States Since 1880: A Summary of Reported Rates and the Distribution of Offenses." Crime and Delinquency 25(Jan):9-41.

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1980 "Populations Trends and Projections," Vol. II in American Prisons and Jails. Washington, D.C.: United States Department of Justice, October.

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1979 "Prison Populaton and Policy Choices, Volume 1 - Preliminary Report to Congress." ABT Associates, Inc., Cambridge, MA.

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1982 Inmate Population Projections, 1982-1987. Colorado Springs.

CONNECTICUT GOVERNOR'S OFFICE JUSTICE PLANNING DIVISION
1982 Final Report of the Task Force on the Prison and Jail Overcrowding Report. Office of Policy and Management, Budget Division, March.

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1976 "Beyond a Straight Line Fit - Probation Projection Techniques Which Use Readily Available Data." Proceedings of the 106th Annual Congress of Correction of the American Correctional Association, Denver, Colorado. pp. 203-13.

DELAWARE STATISTICAL ANALYSIS CENTER
1982 Corrections Populations, Time Series Analysis, Prison, Probation and Parole. Delaware: Governor's Commission on Criminal Justice, November.

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DISTRICT OF COLUMBIA OFFICE OF PLANNING AND PROGRAM ANALYSIS
1982 Population Projections for the Department of Corrections 1982-1985. Washington, D.C.: Department of Corrections, November.

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1975 "Imminent Crisis in Prison Populations." American Journal of Corrections 37/6 (Nov-Dec):20-21 & 36.

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FLORIDA DEPARTMENT OF OFFENDER REHABILITATION
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1977 "Labor Market and Imprisonment." Crime and Social Justice 8:17-31.

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1979 "The Impact of Determinate Sentencing Legislation on Prison Population and Sentence Length: A California Case Study." Public Policy 27(1):69-98.

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SECTION IV

CRIME CAUSATION MODELS

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