



APRIL 1991

WASHINGTON
STATISTICAL
SOCIETY

NEWSLETTER

April 11	Thursday	Cognitive Factors in Comprehending Statistical Graphs
April 12	Friday	A Simulation Estimator for Dynamic Discrete Choice Models
April 12	Friday	The Demand for M1 in the USA, 1960-1988
April 18	Thursday	Neural Nets, Digit Recognition, and Nonlinear Programming
April 25	Thursday	VPLX: The Second Year
May 7	Tuesday	Advances in Accelerated Testing
May 14	Tuesday	StatXact: A Statistical Package
May 15	Wednesday	Structured Problem-Solving for Administrative Processes: A Case Study

ANNOUNCEMENTS

Morris Hansen Memorial Lectures

The Washington Statistical Society is honored to administer a financial grant from WESTAT that will support a series of annual lectures by distinguished statisticians in memory of Morris Hansen who passed away this fall.

In addition to his career at the Bureau of Census, Hansen was senior statistician at WESTAT for 20 years and the Chairman of the Board of Directors at the time of his death. Over his career he made significant contributions to survey sampling, statistical methods and to his profession in many other ways. Since Morris Hansen's

main contributions to statistics were in sampling theory, models for nonsampling errors, and other problems of survey methodology, the central focus of the lectures will be on these aspects of statistics. However, this focus will be interpreted fairly broadly. It is hoped that over the years there will be a mix of academic researchers and those involved in applications. Programs having and outstanding statistician conduct a one or two day workshop will also be considered. It is anticipated that the first **Morris Hansen Memorial Lecture** will occur in the Fall of 1991.

WASHINGTON STATISTICAL SOCIETY PROGRAM CHAIRS

Agriculture & Natural Resources

Cynthia Clark 763-8558
John Herbert 532-4544

Social & Demographic Statistics

Harvey Schwartz 443-6990
Tom Dietz 323-2916

Short Courses

Glenn White 763-7524
Donald Gantz 764-6565
Brad Pafford 447-3623
Sid Schwartz 268-3490

Economics

John Ruser 523-1347
Neil Ericsson 452-3709

Methodology

Sam Slowinski 452-2622
Sue Ahmed 357-6781

Public Health & Biostatistics

Ed Lakatos 496-5905
Gordon Lan 881-9260

Physical Sciences & Engineering

Nozer Singpurwalla 994-7515
Julia Abrahams 696-4320

Statistical Computing

Nancy Flournoy 885-3127
Sylvia Leaver 272-2350

Quality Assurance

Stanley Freedman 586-2038
John Galvin 272-5066

Newsletter Editor

Stephen H. Cohen 523-7551

Employment

Bill Arends 447-6812

PROGRAM ABSTRACTS

TOPIC: COGNITIVE FACTORS IN COMPREHENDING STATISTICAL GRAPHS

SPEAKERS: Don Beu, National Center for Health Statistics
Jared Jobe, National Center for Health Statistics

CHAIR: Andrew White, National Center for Health Statistics

DATE & TIME: Thursday, April 11, 1991, 12:30-2:00 pm.

LOCATION: Room 2736, GAO Bldg., 441 G St., N.W., Washington, D.C. (Near Judiciary Square Metro Station)

SPONSOR: WSS Methodology Section

ABSTRACT: Recently, cognitive research has been conducted on respondents' comprehension of statistical graphs and maps. The speakers will discuss some of the current scientific theory regarding graph comprehension as well as experiments conducted by the Office of Research and Methodology at the National Center for Health Statistics. The session will also include the showing of a videotape of some recent cognitive interviews demonstrating respondent comprehension problems in interpreting various graphs of statistical data published by federal agencies. Finally, the audience will be invited to participate in a short group experiment interpreting statistical graphs from federal agencies.

TOPIC: A SIMULATION ESTIMATOR FOR DYNAMIC DISCRETE CHOICE MODELS

SPEAKER: Robert A. Miller, Carnegie Mellon University and NORC

DATE & TIME: Friday, April 12, 1991, 10:00-11:30 am (Please note special time)

LOCATION: Room 2437, GAO Bldg., 441 G Street, N.W., Washington, D.C.
(Sign in at Guard desk and state purpose and room number of visit.)

SPONSOR: WSS Economics Section and Office of Economic research, Bureau of Labor Statistics

ABSTRACT: In recent work, Hotz and Miller (1990) develop a new strategy for estimating structural models of dynamic, discrete choice. Their approach to estimation exploits representing the value functions for each current choice in terms of the conditional probabilities of actions which might be feasible in the future. Utilizing nonparametric estimates of these future choice probabilities formed from data on observed actions, these authors derive a \sqrt{N} -consistent and asymptotically normal estimator for the structural parameters characterizing agents' optimal decision rules. This estimator greatly reduces the computational burdens encountered in previous approaches to estimation of such parameters. In this paper, we extend the work of Hotz and Miller to cases in which the set of feasible future alternative choices is large. We show that rather than computing estimates of conditional choice probabilities for the future feasible paths which might follow from a current action, one need only estimate those probabilities associated with a simulated path. We characterize the structure used to generate these simulations and an estimator for the structural parameters of the optimal decision rules. We show that the latter is also \sqrt{N} -consistent and asymptotically normal. The derivation of our estimator's asymptotic properties makes use of recent results in Pakes and Pollard (1989). We present results of a Monte Carlo study, based on a model of Rust (1987), which compare the performance of the proposed estimator with the nested fixed-point maximum likelihood estimation strategy used in the previous literature.

PROGRAM ABSTRACTS (continued)

TOPIC: THE DEMAND FOR M1 IN THE USA, 1960-1988

SPEAKER: David F. Hendry, Nuffield College, Oxford, England

CHAIR: Charles Thomas, Federal Reserve Board

DATE & TIME: Friday, April 12, 1991, 3:30-5:00 pm

LOCATION: Room B-1215, Federal Reserve Board, 20th and C Streets, N.W., Washington, D.C.
(entrance on the South side of C St. between 20th and 21st. Also sign in at the guard desk, state purpose and room number of visit.) Please call Margaret Gray at 202-452-3726 by 2:00 pm the day prior to the seminar.

SPONSOR: Federal Reserve Board and Economics Section, WSS

ABSTRACT: Estimated M1 money demand functions in the United States have exhibited regular bouts of "breakdown" over the period of 1960-1988, including the so-called *missing money*, *great velocity decline* and *M1-explosion* Periods. A model is presented to account for this phenomenon by confronting the issues of dynamic specification and financial innovation, and by including inflation, the yield and risk to holding long-term bonds as arguments of the money demand function. The money demand model estimated here displays parameter constancy (stability) over sample and subperiods.

Dynamics are modeled in the error correction framework, from an unrestricted autoregressive-distributed lag equation. Financial innovation is treated by representing the yield on non-transactions M2 as the maximum yield on M2 instruments (rather than the rate on a single instrument) with a learning adjustment to represent adaptation to newly created assets. NOW and SuperNOW accounts are accorded the same treatment. The effects of inflation, real income and T-bill interest rates are incorporated through the error correction mechanism allowing short-run convergence to a demand for real money. Volatility in holding-period yields is used to represent the risk to long-term bond holding, to partial out the effects of shifts in maturity preferences from the observed yield.

The resulting model variance dominates most previously developed models, with an equation standard error of 0.4%, is considerably more constant historically than existing equations, successfully confronting the previous problematic episodes. A series of experiments elucidate the reasons for earlier "breakdowns." The distinctive features of the model are each shown to be important over some time period in accounting for the data evidence.

The presentation will include interactive usage of Hendry's PC econometrics software PC-GIVE in analyzing the money demand data.

TOPIC: NEURAL NETS, DIGIT RECOGNITION, AND NONLINEAR PROGRAMMING

SPEAKER: Garth P. McCormick, The George Washington University

CHAIR: Sylvia G. Leaver, U.S. Bureau of Labor Statistics

DATE & TIME: Thursday, April 18, 1991, 12:30-2:00 pm

LOCATION: Room 2437, GAO Bldg., 441 G Street, N.W., Washington, D.C.
(Sign in at guard desk and state purpose and room number of visit.)

SPONSOR: Statistical Computing Section

ABSTRACT: In this talk, two alternative methods for solving the digit recognition problem are presented. Unlike the traditional Neural Net approach which solves a least squares problem using a models whose unknowns are thresholds and weights on node outputs, the underlying models here utilize the geometry of the digits. The unknowns are the parameters defining relevant geometric forms. The first model estimates the parameters using nonlinear least squares. The second uses the approach of maximum likelihood estimation. Constrained nonlinear programming problems need to be solved in both cases. Examples are given.

PROGRAM ABSTRACTS (continued)

TOPIC: VPLX: THE SECOND YEAR

SPEAKER: Robert E. Fay, U.S. Bureau of Census

CHAIR: Richard Valliant, U.S. Bureau of Labor Statistics

DATE & TIME: Thursday, April 25, 1991, 12:30-2:00 pm

LOCATION: Room 2736, GAO Bldg., 441 G Street, N.W., Washington, D.C.
(Sign in at guard desk and state purpose and room number of visit.)

SPONSOR: Statistical Computing Section

ABSTRACT: VPLX, Variance Estimation for Complex Sample Designs, is a general FORTRAN program for variance estimation through replication. It is designed to be implemented on a wide variety of computing environments, from mainframes to IBM-PCs with math coprocessors. This talk follows one given to WSS over one year ago on the same topic. The intervening year has seen the program approximately double in length and add features missing earlier: the capacity to compute ratio estimates and more complex functions of estimated sample totals; the ability to write estimates variances, and covariances in a format suitable for input to other systems, such as SAS; and additional facility in displaying results in a variety of ways. The talk will discuss the program generally and its role in the 1990 Census Post-Enumeration Survey.

TOPIC: ADVANCES IN ACCELERATED TESTING

SPEAKER: Wayne Nelson, Private Consultant and Senior Research Fellow, NIST.

DATE & TIME: Tuesday, May 7, 1991, 2:00 pm

LOCATION: Lecture Room D, National Institute of Standards and Technology.
Take Rt 270 North to Clopper Road (Exit 10). Due to new security procedures at NIST, all visitors must call Kaye Wade @ 301-975-2838 before 2:00 pm on May 6th. Visitor Control Center will have a list of attendees. Sign in upon arrival.

SPONSOR: Methodology Section, WSS and the Statistical Engineering Division, NIST.

ABSTRACT: This talk describes recent advances in statistical models and methods for accelerated tests. The advances include: 1) Better models for degradation, cumulative damage size effect, multivariable situations, and a mix of failure modes. 2) Stopping a test before all tests fail. 3) The use of larger specimens. 4) Unequal allocation of specimens to overstress conditions. These advances will be illustrated with a variety of applications including electromigration failure of microcircuit conductors, electrical insulation, metal fatigue, creep-rupture, and others.

PROGRAM ABSTRACTS (continued)

TOPIC: STATXACT: A STATISTICAL PACKAGE

SPEAKER: Cyrus R. Mehta, Harvard University & Cytel Software Corporation

CHAIR: Charlie Hallahan, USDA Economic Research Service

DISCUSSANT: Joseph Gastwirth, George Washington University

DATE & TIME: May 14, 1991, 2:00-3:30 pm

LOCATION: 1301 New York Ave., N.W. (@ 13th & New York Ave), Waugh Auditorium basement. Between Metro Center and McPherson Square Metro Station. (Call Charlie Hallahan @ 202-219-0507 to get your name on guard's list for entry.)

SPONSOR: Statistical Computing Section, WSS

ABSTRACT: We will demonstrate StatXact, a new IBM-PC based statistical package for exact nonparametric inference. In small, imbalanced, or heavily tied data sets, p-value and confidence interval estimates that are based on large-sample theory are unreliable. Exact permutational p-values and confidence intervals are obtainable in principle, but are usually computationally intractable. Over the past ten years several numerical algorithms have been developed that make exact inference computationally feasible. These algorithms have been incorporated into StatXact. The package features the following exact tests: *Two-Sample Tests, *R x C Contingency Tables, * Stratified 2 x 2 Contingency Tables, * Stratified 2 x C Contingency Tables (New Module). In addition to demonstrating the software, we will also briefly discuss underlying permutational problems and the ways in which algorithms resolve them inside StatXact

TOPIC: STRUCTURED PROBLEM-SOLVING FOR ADMINISTRATIVE PROCESSES: A CASE STUDY

SPEAKER: John M. Galvin, Bureau of Labor Statistics

CHAIR: Stan Freedman, Energy Information Administration

DATE & TIME: Wednesday, May 15, 1991; 12:30-2:00 pm

LOCATION: Room 2736, GAO Bldg., 441 G Street, N.W., Washington, DC (Sign in at guard desk and state purpose and room number of visit.)

SPONSOR: Quality Assurance Section

ABSTRACT: Administrative processes such as personnel and procurement are often neglected candidates for quality improvement. A common strategy for organizations embarking on quality improvement is to focus solely on "production" processes that directly impact the external customer. While such initiatives are on target with their customer focus, they miss the mark in overlooking the significant impact of administrative processes on the ability of organizations to carry out their missions.

This non-technical presentation relates the experiences of a team of employees who systematically analyzed and improved the performance of an important administrative process. The presentation will start with a discussion of the special characteristics of administrative processes that make structured problem-solving difficult. Next, The problem-solving model used by the team will be described. The main steps in the model are: start up, collect data, and identify root causes, develop solutions, plan and make changes, and closure. Finally, actual results from the case study will be presented for each step in the problem-solving model.

ANNOUNCEMENTS (continued)

Volunteers for Prince George's County Quantitative Literacy Interest Group

The Quantitative Literacy (QL) Interest Group continues to look for volunteers interested in working with local schools.

In the short term, we have been asked to participate in the Career Day at Central High School in Capitol Heights in PG County on April 16, 1991. We also meet with the Chairs of all PG high school math departments in March which may lead to several requests for speakers at schools or for other activities. If you have any interest, call WSS PG County QL Coordinator, Gary Shapiro, @ 301-763-2674 (work) or 301-350-0621 (home).

If you are interested in participating in WSS QL activities in other local jurisdictions, please call Ron Fecso @ 202-475-3486 or Dwight Brock @ 301-496-9795.

New IRS statistics of Income Methodology Report Now Available

The Internal Revenue Service's (IRS) Statistics of Income Division announces the availability of Statistics of Income and Related Administrative Record Research: 1988-1989. This volume is the latest in the IRS Methodology Reports series, which draws together selected papers from annual American Statistical Association (ASA) meetings and other related conferences. It provides a look at current methodological improvements and applications in administrative record research at the IRS

and in the US Federal statistical community.

The present volume contains 35 selected papers, most of which were delivered at the Survey Research Methods sessions of the ASA in New Orleans and Washington, DC. The focus of the collection is on five general areas of interest:

- * *perspectives on statistics in government--including several papers reprinted from the special ASA150 Proceedings;*
- * *improvements in income and wealth estimation;*
- * *methodological enhancements to administrative record data;*
- * *the effects of tax reform; and*
- * *technological innovation for statistical use.*

For more information on the contents of this 276 page publication and how to obtain it, write to:

Director
Statistics of Income Division (R:S)
PO Box 2608
Washington, DC 20013-2608

A limited number of copies of earlier reports in the series are also available. Write to the above address for further information.

Schedule of SIGSTAT Meetings

SIGSTAT is the Joint Special Interest Group in Statistics for the Capital PC User Group and WORMSC. The schedule of events through next May is as follows:

04/10/91	Derive Part 3: Programming in Derive, Applications
05/15/91	Axum-Technical graphics and data analysis, 2D and 3D graphics

All meetings are scheduled for Wednesdays from 12:30-1:30 in Room B-14, 1301 New York Ave., N.W. The building is located midway between the Metro Center and McPherson Square Metro stops. If this is your first SIGSTAT meeting, call Charlie Hallahan, 202-219-0507, and leave your name in order to gain entry into the building.

EMPLOYMENT COLUMN

The Washington Statistical Society Newsletter provides a service of notification of employment opportunities and descriptions of those seeking employment here in the Washington, DC area. Readers are encouraged to take advantage of this feature of the newsletter. Deadline for inserting notices is 5 (five) weeks before the publication date. Those interested should write to: Bill Arends, USDA-NASS, Room 4133 South Building, Washington, D.C. 20250-2000. Contact Mr. Arends at 202-447-6812.

JOB OPENINGS

STATISTICIAN/DEMOGRAPHER: GS 11/12

Survey Statistician for analysis of major family policy issues. Skills in statistical analysis, experimental design, and research design required. Familiarity with major Federal national population-based surveys and experience with interpretation of survey results and findings must be shown. Job involves evaluation and analysis of family functioning. Two year term appointment with health benefits and retirement provided. Salary ranges from GS-11 to GS-12 depending on experience and education. Send resume and/or SF 171 to: Patrick Fagan, Deputy Assistant Secretary, Office of Family, Community, and Long-Term Care Policy, Office of the Assistant Secretary for Planning and Evaluation, DHHS, Humphrey Building, 200 Independence Avenue, S.W., Washington, D.C. 20201. For further information, Call 202-245-6443.

Listed below is a brief description of the qualifications of an applicant seeking employment. Employers interested in interviewing this applicant should notify Mr. Arends of their interest by CODE NUMBER. The request should be by mail and should include the employer's name, organization, and telephone number. The applicant will be notified of the employer's interest and initiation of any further contact will be left to the applicant. All contacts will be kept confidential.

JOB APPLICANTS

CODE NUMBER: 91-01

EDUCATION: * B.A. in Mathematics, Scripps/Pomona College, California.
* M.S. in Mathematical Sciences, Johns Hopkins University, Maryland.
* M.S. in Statistics, Iowa State University, Iowa.

CAREER INTEREST: Interested in working on data analysis, linear models, experimental design, and/or survey sampling, in the research and development area in industry (pharmaceutical or otherwise) or consulting. My Creative Component project involved work on statistical graphics.

EXPERIENCE IN STATISTICS: Graduate Student Instructor of a 5 credit 2nd-3rd year level course in business statistics.

AVAILABILITY: Immediately

VISA STATUS: Permanent Resident. Eligible for U.S. citizenship in May 1993.

THE AMERICAN UNIVERSITY

SPECIAL YEAR IN SAMPLING

42.517.31 Special Topics in Statistical Methodology: Sampling. First 7 week summer session (May-June, 1991).

A study of the classical approaches to sampling involving the basic principles of survey design so as to obtain the best tradeoff between the accuracy (variance and bias) of the estimator and the cost of the survey. The course considers methods for determining expected value, bias, variance and mean square error as applied to different methods of selecting observations from a population. Designs include simple random, systematic, stratified and cluster sampling; estimators include sample means, ratio and regression techniques.

The course should be accessible to people with two previous courses in statistics.

Text:

W. Cochran (1977), Sampling Techniques, John Wiley & Sons, New York.

42.510 Theory of Sampling 1. Fall 1991.

This course considers the theoretical background underlying the finite population approach and should equip the student to read the advanced literature in this field. Review of the classical approaches to sampling, single and multistage cluster sampling, Horvitz-Thompson estimator, pps and ppz estimators. Fixed population and superpopulation approaches. Sufficiency, Rao-Blackwellization, admissibility and the nonexistence of UMV estimators. Design unbiased estimators, optimal strategies, Bayesian approaches, robustness.

The course requires a two semester mathematical statistics course using a textbook such as Hogg and Craig, Introduction to Mathematical Statistics, as background. It will be assumed that the student is also familiar with the material in 42.517 (above).

Texts:

1. Cassel, Sarndal and Wretman(1977), Foundations of Inference in Survey Sampling. John Wiley & Sons, New York.

2. W. Cochran (1977), Sampling Techniques, John Wiley & Sons, New York.

42.511 Theory of Sampling II. Spring 1992.

This course will focus on techniques for estimating the variance of a sample statistic under complex designs and with nonlinear estimators. Method of Random Groups, Generalized Variance Functions, Taylor series methods, Jackknifing, Bootstrapping and Balanced Half Sample approaches.

Prerequisites: 42.517 and 42.510

Texts:

1. K. Wolter (1982), Introduction to Variance Estimation. Springer Verlag.

2. W. Cochran (1977), Sampling Techniques. John Wiley & Sons, New York.

Each Course is 3 semester hours and meets two nights each week. For further information, call Ms Daphne Cox @ 202-885-3120.

Annual Dinner

The WSS Annual Dinner will be held Tuesday, June 11 at 6 p.m. at Bish Thompson's Seafood Restaurant. A choice of five entrees will be offered. Please mark your calendar and plan to join us. Further information will be available in next month's newsletter. The restaurant is located in Bethesda at 7935 Wisconsin Avenue, four blocks north of the Bethesda Metro Station.



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