WASHINGTON STATISTICAL SOCIETY

WSS NEWS

April 1992

CNSTAT Turns 20

On Friday, February 21, 1992, the Committee on National Statistics (CNSTAT), National Academy of Sciences-National Research Council celebrated 20 years, since its formation in 1972 at the recommendation of the President's Commission on Federal Statistics. A special write-up on CNSTAT is provided on page 8.

Short Course on Categorical Data Analysis

The Washington Statistical Society is pleased to announce its third short course for this program year -- **Categorical Data Analysis in the Context of Complex Sample Surveys,** by **Robert E. Fay,** Bureau of the Census.

This course will focus on log-linear and logistic models for categorical data in the context of simple random samples. Basic notation and illustrative examples will be presented, to demonstrate their effectiveness in interpreting interrelationships in categorical survey data. Discussion will follow on the special issues that arise through application of these models in the context of complex samples. Standard errors and suitable test statistics will be described and information on useful software will be presented. The emphasis will be on general results and methods. All participants will receive Bob Fay's detailed notes and handouts.

The short course will be held on Thursday, April 23, 1992, from 8:00 AM to 4:30 PM in the Cabinet-Judiciary Suite of the Hyatt Regency Bethesda. A registration form for the session is enclosed in this newsletter. For further information about the course, contact Glenn White at (202) 874-1114 (at work) or (301) 952-1507 (at home).

WSS Seminars
(All events are open to any interested persons.)

APRIL		
2	Thurs.	The Role of the Statistician in Addressing Technical Issues of National Interest
9	Thurs.	Efficiency Robust Rank Tests for the Location-Scale Problem
16	Thurs.	Function Estimation and Regression Using Density Ridges
23	Thurs.	**Short Course:** Categorical Data Analysis in the Context of Complex Sample Surveys
23	Thurs.	Isolating Errors in State-Space Models of Complex Systems: an Efficient Bayesian Approach
MAY		
19	Tues.	Age and Race Data From the 1990 Census: Dealing with Anomalies and Historical Discontinuities

Announcements

WSS Election Ballot Announced

The election of new officers for the 1992-93 program year will be conducted by ballot with the May newsletter. The following members have agreed to run for office:

Vice President and President-Elect:
Dwight Brock, National Institute on Aging
Michael Cohen, University of Maryland

Methodology Program Chair:
Phillip Kott, National Agricultural Statistics Service
Stewart Scott, Bureau of Labor Statistics

Representative-at-Large (select two):
Sue Ahmed, National Center for Education Statistics
Richard Bolstein, George Mason University
Nancy Flournoy, The American University
Sam Slowinski, Board of Governors of the Federal Reserve System

Treasurer:
Virginia deWolf, Department of Transportation

Candidates other than those listed above may be nominated by petition of at least thirty (30) members of WSS, provided that such a petition is received by the Nominations and Elections Committee, at least two weeks before balloting. Any petitions must be received by Ed Wegman, Center for Computational Statistics, George Mason University, 242 Science Technology Building, Fairfax, VA 22030 by April 17, 1992.

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WSS Social

Mark your calendars for this year's WSS Annual Dinner! The dinner will be held Wednesday, June 10 at the China Garden in Rosslyn, VA. More details on this opportunity to chat with fellow statisticians, enjoy a delicious meal, and hear interesting after-dinner talk will follow in the next newsletter.

(continued on page 6)

Program Abstracts

Topic: The Role of the Statistician in Addressing Technical Issues of National Interest

Speaker: Ronald L. Iman, Sandia National Laboratories

Discussant: Robert Lundegard, National Institute of Standards and Technology

Chair: Rich Allen, National Agricultural Statistics Service

Date/Time: Thursday, April 2, 1992, 12:30-2:00 PM

Location: George Washington University, Bldg. H, Room 105, 2000 G St., NW, Washington, DC (Blue/Orange Lines -- Foggy Bottom)

Sponsor: Physical Science and Engineering Section

Abstract: How should risk for nuclear power generating stations be assessed? Can radioactive wastes be effectively isolated geologically? Statisticians should have a very important role in the resolution of such vital national and international technical issues. In some cases, this role is widely acknowledged and the statistician's help is sought. Sometimes, this role is filled by nonstatisticans. In other situations, the role of the statistician is ignored or is precluded by political considerations.

In this presentation, the speaker uses his personal experiences to consider the role of the statistician in addressing technical issues such as the ones above. He will also draw on his work in the area of the semiconductor industry, the space program and the environment. The discussant, who is the Chief of the Statistical Engineering Division at the National Institute of Standards and Technology, will respond and amplify the role of the statistician based on his experiences with major projects at NIST and at the Naval Research Laboratory.

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Topic: Efficiency Robust Rank Tests for the Location-Scale Problem

Speaker: Marvin Podgor, National Eye Institute

Chair: Dean Follmann, National Heart, Lung and Blood Institute

Date/Time: Thursday, April 9, 1992, 12:30-2:00 PM

Location: National Institutes of Health, Bldg. 31, Conference Room 10, 9000 Rockville Pike, Bethesda, MD (Red Line -- Medical Center)

Sponsor: Public Health and Biostatistics Section

Program Abstracts (cont'd)

Efficiency Robust Rank Tests for the Location-Scale Problem (cont'd)

Abstract: Most two-sample tests are developed for either a location or a scale change. In some situations both parameters can change in a consistent manner, e.g., the scale change is proportional to the location change. Asymptotically, most powerful rank tests for this problem were considered by Lepage. These tests, however, depend on knowing the underlying distribution and the constant, ℓ, of proportionality. Often one might only know a range of possible values of ℓ and a family of distributions that could generate the data. We use efficiency robustness techniques to obtain tests having high relative efficiency in this setting. We also demonstrate the usefulness of these procedures in a small sample setting and illustrate their application on data from an ophthalmologic clinical trial.

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Topic: Function Estimation and Regression Using Density Ridges

Speaker: Qiang Luo, George Mason University

Chair: Nancy Flournoy, The American University

Date/Time: Thursday, April 16, 1992, 12:30-2:00 PM

Location: GAO Building, Room 2437, 441 G Street, NW, Washington, DC (Red Line -- Judiciary Square) Sign in at guard's desk and state destination.

Sponsor: Statistical Computing Section

Abstract: In this paper, co-authored by Edward J. Wegman, we explore a geometric generalization of nonlinear function estimation and regression. The idea is to use certain estimated geometric features of a joint probability density to produce the function estimates. A k-ridge of a d-dimensional density is the k-dimensional smooth manifold on the density surface that maximizes the likelihood function defined as the volume under the manifold. The k-skeleton is the support of the k-ridge. Such skeletons are self consistent with respect to mode; that is, each point on the skeleton is the conditional mode of the density, conditioned on the skeleton itself. A k-selection is the k-dimensional nonlinear summarizing feature for a d-dimensional data set. It is a geometric generalization of the principal curves and surfaces (Hastie, 1984). The proposed method can handle very complex nonlinear structures, including self-intersecting structures and structures with mixed dimension. Since the conditional mode is used instead of conditional expectation, the ridge function estimator is inherently robust against outliers. Conditioned on the independent variables, the ridge method extends directly to the regression problem, leading to a class of robust estimators similar to LOWESS (Cleveland, 1979).

Program Abstracts (cont'd)

Topic: Isolating Errors in State-Space Models of Complex Systems: An Efficient Bayesian Approach

Speaker: John L. Maryak, Johns Hopkins University

Discussant: Myron Katzoff, National Center for Health Statistics

Chair: Telba Z. Irony, George Washington University

Date/Time: Thursday, April 23, 1992, 11:00 AM-12:00 Noon

Location: George Washington University, Staughton Hall, Room 301, 707 22nd Street, NW, Washington, DC (Blue/Orange Lines -- Foggy Bottom)

Sponsor: Physical Sciences and Engineering Section and Methodology Section, WSS and Department of Operations Research, GWU

Abstract: One of the steps in creating a mathematical model of a system is to test the preliminary model to see whether it is performing adequately. Often, it is found that the model is not performing acceptably (e.g., if the model is not giving accurate predictions of the actual system's performance). This lack of fidelity can also be observed in established models that had been performing well, indicating a change in the actual system. At this point, it is necessary to diagnose where the problem in the model lies, a process called "error isolation." We describe a Bayesian error isolation technique for detecting the misspecified model parameter (or set of parameters). This technique is designed for use on models (of general form) of large-scale systems and overcomes the large computational burden (for numerical integration) ordinarily associated with a Bayesian analysis. We present an implementation of the technique especially tailored for use with state-space models and report on an application of the methodology to localizing errors in the model of an inertial navigation system. Applications to quality control and to an econometric model will also be discussed.

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***** Note from *WSS NEWS* Editors *****

Items for publication in the May *WSS NEWS* should be submitted no later than **Tuesday, March 31, 1992.** Fax items to:

Bettye Jamerson or Wendy Alvey
Fax: (202) 874-0922

Announcements (cont'd)

Patricia Roberts Harris Fellowship

The Department of Mathematics and Statistics of The American University anticipates having available several Patricia Roberts Harris Fellowships for students admitted to its doctoral programs in statistics or mathematics education in September 1992. These fellowships are intended to increase the participation of women and underrepresented minorities in the mathematical sciences.

The fellowships, for U.S. citizens/resident aliens, are contingent upon the approval of funding from the U.S. Department of Education and provide full tuition and stipend of $10,000. No duties are required as a condition of the fellowship, but additional support is available through adjunct teaching appointments. In addition to support from the U.S. Department of Education, fellowships in the department are funded by the University, itself. Tuition support and variable stipends (up to $12,000) are provided and teaching or lab duties are required.

For additional information, please contact Dr. Robert W. Jernigan, Chair, or Professor Mary W. Gray, Department of Mathematics and Statistics, The American University, Washington, DC 20016-8050. Phone: (202) 885-3120; Fax: (202) 885-3155.

QL Update

A meeting of Quantitative Literacy volunteers was held on February 26, 1992. Twenty volunteers, representing most area jurisdictions were able to attend. The purpose of the meeting was to share ideas on how to improve and increase WSS' QL activities. A structured brainstorming session was held to develop a plan for the future. If you would like to find out about these activities, please call Ron Fecso at (202) 334-2295 or Easley Hoy at (301) 763-7800.

Role Models Needed

One key to enticing more school-age girls to higher achievement in math and science is to expose them to successful female role models. While there are many women teachers for them to look up to, often math and science is not their strong suit. This, plus subtle influences, tends to lower girls' expectations about careers in math and science.

An effort is, therefore, being made to attract successful women (outside of education) who would be willing to serve as role models and tutor school-age girls. Show them that career opportunities exist and help them develop more positive attitudes towards a future in math or science. For more information, contact: Laurie Smith, Mt. Vernon College, 2100 Foxhall Road, NW, Washington, DC 20007. Phone: (202) 625-4633.

Washington Deming Study Group

A Deming Study Group has recently been formed in the DC area by the Washington chapter of the American Society for Quality Control (ASQC). The group, endorsed by W. Edwards Deming, will meet regularly to discuss all areas of quality. The next meeting -- scheduled for Tuesday, April 14, from 5:30 - 7:30 PM at ESI, Room 250, 2100 Pennsylvania Ave., NW, Washington, DC -- will feature guest speaker Peter Scholtes, Joiner Associates. For more information, call Kay L. Carlson at (301) 340-0293.

Announcements (cont'd)

Conference on Attrition in Longitudinal Surveys

All longitudinal surveys lose portions of their samples to nonresponse. While it is easy to calculate response rates and describe the initial characteristics of subsequent nonrespondents, there has been very little work on how attrition might affect parameter estimates of behavioral models.

To encourage work in this area, the Board of Overseers of the Panel Survey of Income Dynamics (PSID) -- under the sponsorship of the National Science Foundation, the Bureau of Labor Statistics, the Bureau of the Census and the National Center for Education Statistics -- is organizing a conference on Attrition in Longitudinal Surveys for the spring or summer of 1993. Research on one or more of the following studies is of particular interest: the PSID, the National Longitudinal Surveys, the Survey of Income and Program Participation, the National Longitudinal Study of the Class of 1972, High School and Beyond, and the National Education Longitudinal Study of 1988.

Abstracts are due April 15, 1992. About 20 proposed papers will be selected by May 15, 1992. For more information, contact Mary Wreford, Room 3200, Institute for Social Research, University of Michigan, PO Box 1248, Ann Arbor, MI 48106-1248. Send electronic mail to WREFORD@ UM.CC.UMICH.EDU or USERSSWA @UMICHUM.BITNET.

Preliminary Announcement:

NIH Conference on Biostatistics

A National Institutes of Health (NIH) conference on the applications of statistics to biomedical research will be held on the NIH Campus in Bethesda, MD, January 25-26, 1993. The program will include a broad range of topics covering methodologic approaches to the diverse design and analysis issues encountered by NIH statisticians. Attendance will be limited by the capacity of the lecture hall (approximately 150). A modest registration fee is anticipated. A banquet honoring those who introduced statistics to NIH will be held on the evening of Monday, January 25th (fee event). Details and registration forms will be availiable later this year. For further information, please send name and complete address to:

NIH Conference on Biostatistics
c/o Jonas H. Ellenberg, Ph.D.
7550 Wisconsin Avenue, Room 7A-12
Bethesda, Maryland 20895
or FAX (301) 496-3444.

Tentative Schedule of SIGSTAT Meetings

SIGSTAT is the Joint Special Interest Group in Statistics for the Capital PC User Group and WORMSC (Washington Operations Research/ Management Science Council). The tentative schedule of events for the next few months is as follows:

April 8 **Using SAS/IML for Statistical Programming.--** Examples using the Interactive Matrix Language in SAS (bootstrapping, smoothing, ...).

May 13 **Mesosaur.--**A time series analysis from the Soviet Union distributed by SYSTAT Inc. Includes hot-linked graphs (change data values and the graph instantly changes & conversely).

Announcements (cont'd)

Tentative Schedule of SIGSTAT Meetings (cont'd)

June 3 **Microfit.**--An interactive, menu-driven, econometric package from England. Includes many specification tests.

All meetings are scheduled for Wednesdays from 12:30 - 1:30 PM in Room B-14, 1301 New York Ave., NW. (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, to gain entry into the building.

Committee on National Statistics Celebrates Twentieth

The Committee on National Statistics recently celebrated its twentieth anniversary at the National Academy of Sciences. Joining the Committee in its celebration were Congressman Tom Sawyer and Senator Daniel Patrick Moynihan, as well as members of the 1971 President's Commission on Federal Statistics, the group that recommended the creation of the Committee.

The Committee's Work

The Committee on National Statistics was established at the National Academy of Sciences-National Research Council (NAS-NRC) in 1972, at the recommendation of the President's Commission on Federal Statistics. The Committee has a broad charter to select and study statistical topics to improve the effectiveness of the national statistical system by reviewing the statistical programs of federal agencies and suggesting improvements. It studies what data and methodology are needed to improve understanding of national issues for which public policy decisions are made. Topics of past studies have included crime, pollution and its effects, education, immigration, productivity, the census, poverty, quality of social welfare programs, the aging population, and statistics in the courts. Some studies that have made major contributions to statistical methods include ones on incomplete data, small-area estimation, cognitive aspects of survey methodology, and meta-analysis. The Committee is a major division of the NAS-NRC Commission on Behavioral and Social Sciences and Education.

New Activities: The Year 2000 Census and Poverty Statistics

A major new activity of the Committee is a detailed examination of the next decennial census. The Committee's study on the census in the year 2000 will be conducted by two panels. One panel will focus on census requirements in the year 2000 and beyond, as requested by Congress. The panel will recommend alternative ways of enumerating the population, evaluate the needs for data currently collected in the census, and identify whether the census or other data collection is more effective to meet those needs. The panel will be chaired by Charles L. Schultze, former Chairman of the Council of Economic Advisors and currently a senior fellow at The Brookings Institution.

A separate panel, requested by the Bureau of the Census, will focus on more technical aspects of evaluating alternative census methods. Norman M. Bradburn, Director of the National Opinion Research Center at the University of Chicago, will chair this panel. Because the study, through the two panels, will consider not only new ways to take the census, but also ways to meet the information needs for public policy through other means, it will have important implications for the entire federal statistical system.

Announcements (cont'd)

CNSTAT Celebrates Twentieth (cont'd)

The new study on poverty and family assistance, also requested by the Congress, will address statistical issues involved in measuring and understanding poverty and in establishing a national minimum welfare benefit for low-income families with children. The study will focus on the concepts, information, and measurement methods needed for decisions on poverty threshold and minimum welfare benefits.

Current Activities

Three Committee projects are nearing completion. The Panel on the Survey of Income and Program Participation (SIPP) is carrying out an in-depth review of the SIPP program, examining design and content features of the survey, and considering ways to improve the uses of SIPP longitudinal data. The Panel to Review Evaluation Studies of Bilingual Education is reviewing and assessing the methodology of data collection and analysis of two major studies of bilingual education programs. The panel on Confidentiality and Data Access is studying issues associated with better accommodating the increasing tension between data access and confidentiality. All three projects are expected to issue their reports later this year.

Other current activities of the Committee include the proceedings of a conference on the supply and demand for pre-college science and mathematics teachers and a study of quality improvement of student financial aid programs. The Committee is also launching a second phase of its study on foreign trade statistics, which will focus on international capital transactions. Two workshops are planned for this year: one on national economic accounts and one on statistical issues in defense analysis and testing. In the early stage of development is a study on disability statistics.

Reports recently issued by the Committee include **Improving Information for Social Policy Decisions: The Uses of Microsimulation Modeling** and **Toward a National Health Care System: A Data System for the Twenty-First Century** and a workshop report on the Center for Survey Methods, to be funded by the National Science Foundation. Another report, **Behind the Numbers: U.S. Trade in the World Economy**, was the subject of a press conference upon its publication in January.

Information about the Committee can be obtained from Miron L. Straf, Director, Committee on National Statistics, 2101 Constitution Avenue, NW, Washington, D.C. 20418; telephone (202) 334-3096. Committee reports are available from the National Academy Press, telephone 1-800-624-6242.

COMMITTEE ON NATIONAL STATISTICS, 1991-1992

Burton H. Singer (Chair), Yale University
Norman M. Bradburn, University of Chicago
Martin H. David, University of Wisconsin
Angus S. Deaton, Princeton University
Noreen Goldman, Princeton University
Louis Gordon, University of Southern California
Joel B. Greenhouse, Carnegie Mellon University
Robert M. Hauser, University of Wisconsin
Graham Kalton, Westat, Inc., Rockville, MD
William A. Morrill, Mathtech, Inc., Princeton, NJ
Janet L. Norwood, The Urban Institute, Washington, DC
Dorothy P. Rice, University of California, San Francisco
John E. Rolph, The Rand Corporation, Santa Monica, CA
Donald B. Rubin, Harvard University
Staff Director: Miron L. Straf

Employment Column

As a service to local statisticians, the **Washington Statistical Society News** provides 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. The deadline for inserting notices is five (5) weeks before the publication date. Those interested should write to: Bill Arends, USDA-NASS, Room 4133 South Building, Washington, DC 20250-2000. Contact Mr. Arends at (202) 720-6812.

EPA Statistician/Math Stat Job

The Health Effects Division, Office of Pesticide Programs, U.S. Environmental Protection Agency has an opening for a junior or mid-level statistician (GS 7- GS 12; GS-1529 or GS-1530). Statistical expertise plays an important role in making regulatory decisions by contributing to the process of risk assessment of dietary exposure to pesticides.

Range of activities and responsibilities includes: review of industry submissions; full responsibility for data analyses and statistical conclusions; and preparation of written reports and oral briefings.

Type of experience or background utilized includes: analysis of dietary residue exposure chemistry; mathematics of sampling in complex surveys; bioassay analysis of animal studies; applied estimation techniques; applied risk analysis; and statistical computing and data management.

Salary is commensurate with training and experience, $22,000 to $50,000. US citizenship is required. Office is located in Arlington, Virginia. For more information, contact: Maureen Clifford, OPP/HED, Mail Code H7509C, EPA, 401 M St., SW, Washington, DC 20460. Phone: (703) 308-2827. EOE

Obituary

William Gregory Madow, 1911-1992

William Gregory Madow, one of the major innovators of sampling theory, died on February 11, 1992, from a heart ailment. He was 81 years old.

A child of Russian immigrants, Madow grew up in New York City, where he pursued his college education, earning degrees from Columbia University. In 1938 he received his Ph.D. in Mathematics for his dissertation on multivariate distribution theory, under the direction of Harold Hotelling. He, then, went on to work on the distribution of quadratic and bilinear forms and of serial correlation, contributions which were published in the **Annals of Mathematical Statistics** and in the **Transactions of the American Mathematical Society.**

In 1939, Madow came to Washington, DC, where he went to work for the federal government -- primarily, at the Bureau of the Census. It was there that he met his wife, Lillian, and where he joined forces with Morris Hansen and William Hurwitz (and others), who were making major innovative contributions to sampling theory. In 1944, the first of three seminal papers "On the Theory of Systematic Sampling," (co-authored with Lillian Madow) was published in the **Annals of Mathematical Statistics**. (See, also, Madow, 1949 and Madow, 1953.) These papers were to become the cornerstone for systematic sampling. Later, in 1953, Hansen, Hurwitz and Madow completed the two-volume opus, **Sample Survey Methods and Theory**, that still stands today among the definitive works on sampling theory.

Obituary (cont'd)

William Gregory Madow (cont'd)

After teaching at several universities in the U.S. and abroad, the Madows settled in California, where he taught at Stanford University from 1957 to 1975. During that time Madow was elected Fellow of the Institute of Mathematical Statistics, the American Statistical Association, and the American Association for the Advancement of Science. He was often called on to help with sampling problems and served as a member of several government panels, including the Census Bureau's Panel of Statistical Consultants (1955-1968), the Census Advisory Committee of the American Statistical Association (1973-1975), and the Advisory Panel on Education Statistics. In 1976 he also became a consultant to the Committee on National Statistics, National Academy of Sciences, where, in 1983, he co-edited the three-volume set **Incomplete Data in Sample Surveys**, with Ingram Olkin and Don Rubin.

William Madow has left a legacy of important contributions to the development of sample surveys. His pioneering efforts will not be forgotten. A special session in his honor will be held at Stanford this month. WSS will be organizing a memorial session later this spring.

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A LIGHT NOTE

In conjunction with our lunch time seminar series on variance estimation, it seemed only fitting to share the following delightful poem. The submission, by Miriam Rosenthal, recently appeared in **Chance** (Vol. 4, No. 3, 1991). Rosenthal works in the Statistical Methods Division, Bureau of the Census.

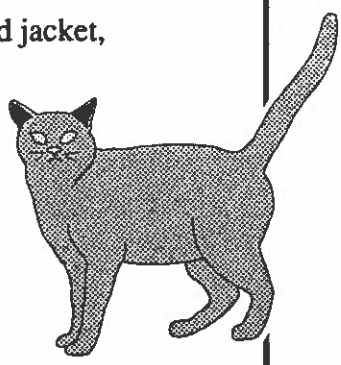
A Cat's Guide to Variance Estimation

Miriam D. Rosenthal

Puss in Boots strapped a sample to her back
And in intervals of decreasing confidence tried to replicate her steps.
Her estimators were unstable, imprecise, inconsistent
And, if I may interject my biased opinion, downright poor
Lacking the balance needed to achieve a Hadamard
That would get her home most efficiently.

Not to worry, though.
She randomly regrouped, buttoned up her disheveled taylored jacket,
Readjusted her weighted theta hat
Then jackknifed and pseudo-stratified onto the normal curve
Which set her confidently with a modest effort
And enough degrees of freedom on a linear path.

Wolter, Fay, Rao and Wu; Sitter and Judkins too?
Anyway, for a real (design?) effect, a Kish will do.



WASHINGTON STATISTICAL SOCIETY

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