



WSS NEWS

WASHINGTON
STATISTICAL
SOCIETY

October 1992

2nd Morris Hansen Memorial Lecture Set

The Washington Statistical Society is pleased to announce that the second in an annual series of lectures to honor the memory of Morris Hansen has been set for Tuesday, November 17, 1992, in the Jefferson Auditorium of the Department of Agriculture, South Building. Wayne Fuller, a distinguished Professor in the Departments of Statistics and Economics at Iowa State University will be the guest lecturer. Dr. Fuller is a Fellow of the American Statistical Association and of the Institute of Mathematical Statistics, and is currently Vice President of ASA. He will give a brief review of Hansen's contributions and will examine the importance of measurement error for parameter estimation and for the design of statistical studies, particularly sample surveys. A reception will follow Dr. Fuller's talk.

This lecture series was established in 1990 by a financial grant from Westat, Inc., to honor Morris Hansen, who made significant contributions to survey sampling and statistical methods during his long and distinguished career at the Census Bureau and at Westat, Inc. Further details on this year's program will be published in the November issue of the *WSS NEWS*.

QL Literacy Program to Expand

The WSS Quantitative Literacy group is holding an informational and recruiting seminar on October 28, 1992. If you are interested in participating in the QL program in your county, then this seminar is for you. A full description of the seminar is provided in the "program abstract" section of this newsletter.

In addition to the general call for volunteers, the WSS Quantitative Literacy Program has a greater need for statisticians willing to help out in Fairfax County, VA. During a recent meeting
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WSS Seminars		
(All events are open to any interested persons.)		
October		
1	Thur.	Wavelet-Based Visualization of Sequences of Images
7	Wed.	On the Road to Benchmarking with Bob Hogg
7	Wed.	A Method of Post-Stratified Estimation and Nonresponse Adjustment
8	Thur.	Analysis of Data from Complex Surveys: Multiple Comparison Methods for Data Review of Census of Agriculture Press Releases
13	Tues.	The Art and Science of Political Polling
20	Tues.	Handling Missing (or Bad) Data: Imputation for Missing Survey Responses -- A Review
22	Thur.	The State of the Economy before the Election
28	Wed.	Quantitative Literacy Informational/Recruiting Seminar

Announcements

New 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: 1990*. 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 contains 19 papers, most of which were presented at the ASA annual meetings held in Anaheim, California.

The papers selected for this volume contain discussions of methodological improvements and applications currently underway in the U.S. Federal statistical community. In particular, the focus is on work done by the Statistics of Income Division of the IRS. Five general areas of interest are presented:

- longitudinal panel and estimation issues;
- analytical research using survey and administrative data;
- design issues for Federal surveys;
- information on the conclusions of the Establishment Reporting Unit Match Study; and
- a look at future data needs for the Federal sector.

The present collection is the last in a series of reports entitled *Statistics of Income and Related Administrative Record Research*. Future reports in the series will appear under a new title, the first of which is to be published later this year. For more information on the contents of this 180-page publication and how to obtain it, write to: Director, Statistics of Income Division (R:S); P.O. Box 2608, Washington, DC 20013-2608. A limited number of copies of earlier reports in the series is also available. Write to the above address for further information.

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 two months is as follows:

Oct. 21 SPSS for Windows.--The popular statistical package is now available under WINDOWS. New features include automatic statistical graphs to display the result of tests.

Nov. 18 S-Plus Programming.--Examples of using S-Plus as a statistical programming language will be presented.

All meetings are scheduled for Wednesdays from 12:30 - 1:30 PM in Room B-14, 1301 New York Ave., NW, Washington, DC. (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.

Accelerated Testing Course Announced

A course on Accelerated Testing: Statistical Models, Test Plans, and Data Analyses will be conducted by Wayne Nelson, Fellow ASA, ASQC and IEEE, on the following dates and locations:

Oct. 12-15, 1992 -- Detroit, MI
Nov. 30 - Dec. 3, 1992 -- Washington, DC
(Courtyard Marriott, Rosslyn, VA)
Jan. 11-15, 1993 -- San Jose, CA

This course will benefit engineers, statisticians,
(Continued on page 11.)

Program Abstracts

Topic: Wavelet-Based Visualization of Sequences of Images

Speaker: Andrew G. Bruce, Statistical Sciences, Inc.

Chair: Catherine Hurley, George Washington University

Date/Time: Thursday, October 1, 1992, 12:30 - 2:00 PM

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

Sponsor: Methodology Section and George Washington University

Abstract: The volume of digital image data available for analysis is rapidly exploding in a variety of areas, such as remote sensing, HDTV and medical imaging. There is a lack of software for effective analysis of these huge volumes of image data. To meet this need, a wavelet-based "image browser" for visualization of sequences of images is being developed.

The 2D-wavelet transform decomposes an image into an orthonormal basis, providing a natural framework for "multi-resolution" image analysis. The low-frequency 2D-wavelet representations allow a sequence of images to be scanned at a coarse resolution. An image which appears interesting can then be viewed at full resolution. The high-frequency components of the wavelet transform provide the capability to visualize the edges of an image.

The use of the 3D-wavelet transform of sequences of images is also being explored. In sequences with temporal redundancy, the 3D representation allows more efficient representation of a signal. In addition, the 3D-wavelet temporal high-frequency component yields a visualization tool for change detection in sequence of images.

The image browser is being developed in the X-Windows environment on top of the Khoros system for image analysis and visualization. As a companion to the image browser, an interface is provided to the S-PLUS statistical system. This allows one to manipulate the wavelet transform of a signal or image using standard data analysis and statistical tools.

Program Abstracts (cont'd)

Topic: On the Road to Benchmarking with Bob Hogg

Speaker: Robert Hogg, University of Iowa

Chair: Fritz Scheuren, Internal Revenue Service

Date/Time: Wednesday, October 7, 1992, 12:30 - 2:00 PM

Location: Postal Square Building, Room G-440, Meeting Room 1, 2 Massachusetts Ave., NE Washington, DC (Red Line -- Union Station). Enter at First Street (main BLS entrance). Take elevator down to ground floor, through double doors to Conference and Training Center.

Abstract: This talk will describe the speaker's trip to approximately 20 companies and universities in which he attended meetings relating to total quality management (TQM). Specific illustrations of the quality principles in use by the better companies will be presented. Drawing on discussions with people in industry about the role of statisticians in the quality movement, this talk will also provide thoughts about what should be taught in statistics programs, as well as how to get TQM started.

Program Abstracts (cont'd)

Topic: A Method of Post-Stratified Estimation and Nonresponse Adjustment

Speaker: Steve Woodruff, Bureau of Labor Statistics

Chair: James T. Massey, National Center for Health Statistics

Date/Time: Wednesday, October 7, 1992, 1:30 - 3:30 PM

Location: National Center for Health Statistics, Auditorium, Presidential Building, 11th Floor, 6525 Belcrest Road, Hyattsville, MD

Sponsors: Office of Research and Methodology, NCHS and the Washington Statistical Society

Abstract: In survey sampling we are usually collecting data on many study variates, some of which are correlated with the sample design variable and others which are not (peripheral variates). A sample design which is nearly optimal for estimating (via Horvitz-Thompson (HT)) the means of those variates which are correlated with the design variable may be extremely inefficient for estimating (via HT) means of peripheral variates. In addition, item nonresponse is often a problem for both correlated and peripheral variates. These problems can be addressed by first post-stratifying on one or more other auxiliary variates which are correlated with the peripheral variates, and then using known data dependencies to let the responses "lend strength" to the missing data items in a way that is equivalent to imputation. This talk describes a way of building an estimator, which makes use of the available data together with the relationships between data items to reduce the error of estimates in the presence of these typical sampling problems.

Program Abstracts (cont'd)

Topic: Analysis of Data from Complex Surveys: Multiple Comparison Methods for Data Review of Census of Agriculture Press Releases (5th in series)

Speaker: Richard Griffiths, Bureau of the Census

Discussant: Susan Ahmed, National Center for Education Statistics

Date/Time: Thursday, October 8, 1992, 12:30 - 2:00 PM

Location: Postal Square Building, Room G-440, Meeting Room 8, 2 Massachusetts Ave., NE, Washington, DC (Red Line -- Union Station). Enter at First Street (main BLS entrance). Take elevator down to ground floor and go through double doors to Conference and Training Center.

Sponsor: Methodology Section

Abstract: When given the problem of ranking a set of K populations (or K items), it is appropriate, in order to control the experimentwise type I error rate, to employ multiple comparison methodology. Such a problem is encountered in the data review of census of agriculture press releases. This review process involves verifying statements, generally pairwise comparisons, via tests of hypotheses. Sets of pairwise comparisons are naturally defined in the context of rankings of items. It is for these sets that we are interested in controlling the experimentwise error rate. This talk concerns itself with an empirical quantification of the differences among four multiple comparison methods: Scheffe, Bonferroni, Sidak, and Tukey-Kramer. The 1987 Census of Agriculture press release data are used for the empirical analysis. The talk examines some theoretical concerns and presents results of the empirical study. Observed differences among the four methods, as well as recommendations, are presented.

Program Abstracts (cont'd)

Topic: The Art and Science of Political Polling

Speaker: Richard Morin, *The Washington Post*

Discussant: Allan J. Lichtman, The American University

Chair: Michael A. Greene, The American University

Date/Time: Tuesday, October 13, 1992, 12:30 - 2:00 PM

Location: Postal Square Building, Room G-440, Meeting Room 10, 2 Massachusetts Ave., NE, Washington, DC (Red Line -- Union Station). Enter at First Street (main BLS entrance). Take elevator down to ground floor and go through double doors to Conference and Training Center.

Sponsor: Social and Demographic Section

Abstract: Right after the Republican National Convention in August, one poll found a difference of ten percent between Bush and Clinton, while another found that they were dead even. Why do polls disagree so much? Why are there Republican polls and Democratic polls? The talk will discuss sources of bias and variability in polls which go beyond the "margin of error." Using information from polls and his own model, the speaker will also predict the winner of the election.

Program Abstracts (cont'd)

Topic: Handling Missing (or Bad) Data: Imputation for Missing Survey Responses -- A Review (1st in series)

Speaker: Graham Kalton, Westat, Inc.

Discussant: Fritz Scheuren, Internal Revenue Service

Date/Time: Tuesday, October 20, 1992, 12:30 - 2:00 PM

Location: Postal Square Building, Room G-440, Meeting Room 8, 2 Massachusetts Ave., NE, Washington, DC (Red Line -- Union Station). Enter at First Street (main BLS entrance). Take elevator down to ground floor and go through double doors to Conference and Training Center.

Sponsor: Methodology Section

Abstract: The talk will review and compare a variety of commonly used imputation methods, including mean value, hot deck, and regression imputations. The various methods are placed in the common framework of a regression model. Within this model, deterministic imputation methods are defined as those that assign predicted values from the regression for the missing values, whereas stochastic methods are defined as those that assign predicted values, plus randomly chosen residuals. The effects of the various imputation methods on the distribution of the variable subject to imputation and on the relationships between that variable and other variables are examined. The problems involved in imputing for many variables in a survey data set are considered. The estimation of standard errors of survey estimates when imputation has been used is discussed and the use of multiple imputation methodology for this purpose is reviewed.

Program Abstracts (cont'd)

Topic: The State of the Economy Before the Election

Speaker: Ralph Monaco, Department of Agriculture

Chair: Michael Horrigan, Bureau of Labor Statistics

Date/Time: Thursday, October 22, 1992, 12:00 - 1:30 PM

Location: Postal Square Building, Room G-440, Meeting Room 8, 2 Massachusetts Ave., NE, Washington, DC (Red Line -- Union Station). Enter at First Street (main BLS entrance). Take elevator down to ground floor and go through double doors to Conference and Training Center.

Sponsor: Social and Demographic Section

Abstract: As the national election nears, how the electorate perceives the state of the economy and its likely direction may have a considerable impact on voters. This session will discuss the current state of the economy, the forecast for the near term, and how the economic statistics match up with voter perception. During 1990-91, the speaker was a Senior Staff Economist for macroeconomics and forecasting at the Council of Economic Advisors.

Program Abstracts (cont'd)

Topic: Quantitative Literacy Information and Recruiting Seminar

Speaker: Shail Butani and other WSS QL Program Members

Chair: Ron Fecso, Department of Agriculture

Date/Time: Wednesday, October 28, 1992, 12:00 Noon - 2:00 PM

Location: Postal Square Building, Room G-440, Meeting Room 10, 2 Massachusetts Ave., NE, Washington, DC (Red Line -- Union Station) Enter at First Street (main BLS entrance). Take elevator down one level to ground floor, through double doors to Conference and Training Center.

Sponsor: Quantitative Literacy Section

Abstract: In this seminar, the audience will have an opportunity to learn about the QL program, to ask questions, and to become a volunteer. Fairfax County, Virginia, educators have recently requested the WSS QL section to provide speakers for each of their eighth grade classes (approximately 125) during the 1992-93 school year. Several volunteers will describe the QL activities in which they have participated, they will give a demonstration of the type of presentation that will meet Fairfax County's request.



*** * * ATTENTION * * ***

The one-page pamphlet prepared by the Quantitative Literacy Committee is provided for you to share with your neighborhood schools.

Announcements (cont'd)

QL Literacy Program to Expand (cont'd)

with educators, Shail Butani, the QL coordinator for Fairfax County, was asked to provide volunteers to speak to all 8th grade classes (about 125) in the County about what statistics is, what statisticians do, and about careers in statistics. The educators' request provides the QL program access to its largest audience to date. It enables the WSS QL program to continue educating our area's youth about the usefulness and necessity of statistics and critical statistical thinking in today's society.

Would you like an opportunity to speak in Fairfax County classrooms in the 1992-93 school year? If so, please contact Butani at (202) 606-6347 and plan to attend the QL Seminar on October 28th.

Accelerated Testing Course Announced (cont'd)

and others working in development, reliability, testing, manufacturing, procurement and data analysis. You will learn how to plan efficient tests and to accurately estimate and improve product reliability using accelerated test data. You are encouraged to bring your data to the course.

The course fee of \$1,195 includes the Wiley textbook, *Accelerated Testing*, by Dr. Wayne Nelson, supplementary materials, and break refreshments. For the detailed course flyer or registration information, phone Convention Services, (518) 383-5937, ext. 575. For technical details, contact Dr. Nelson at (518) 346-5138.

Mid-Atlantic Regional Probability and Statistics Day -- October 24, 1992

The Johns Hopkins University, Applied Physics Laboratory invites you to the next meeting of the on-

going series of regional Probability and Statistics Days. These informal meetings offer a chance for professionals in academia, government, and industry in the Mid-Atlantic region to meet with each other, communicate recent findings, and discuss common interests. The Laboratory is located approximately midway between Baltimore and Washington.

Invited and contributed talks will be presented from about 9:00 AM until about 5:00 PM. A fee of about \$14.00 will cover registration, lunch, and refreshments. For further information, please contact John L. Maryak, The Johns Hopkins University, Applied Physics Laboratory, Johns Hopkins Road, Laurel, MD. Contact Mr. Maryak at (301) 953-5000, ext. 4959, or (410) 792-5000, ext. 4959.

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.

Vacancy

Statistician/Economist/Social Scientist

The Division of Science Resources Studies, National Science Foundation, is planning to fill four positions as statisticians, economists, and/or social scientists. The persons selected will be responsible for aspects of the design, management, and/or

Employment Column (cont'd)

Statistician/Economist/Social Scientist (cont'd)

analysis of survey data related to science and engineering (S&E) personnel, investment, or international S&E activities. One of the positions will include econometric modeling of the S&E labor force. Initial salary will be at the GS-11/12/13 levels (\$32,423 - \$60,070). Applicants should have skills in several of the following areas: sampling statistics, computer modeling, questionnaire design, data analysis, survey operations, econometrics, contract management, and report writing. Familiarity with S&E issues is highly desirable. Relevant education and/or experience are required. To obtain more detailed description of the positions, call or write Dr. Carolyn Shettle, Director, S&E Personnel Program, Division of Science Resources Studies, National Science Foundation, 1800 G Street (L-609), Washington, DC 20550. Contact Dr. Shettle at (202) 634-4664. EOE.

Fellowship Announcement

ASA/NSF/NIST 1993-94 Senior Research Fellowship Program.--The Program, cosponsored by the National Science Foundation and the National

Institute of Standards and Technology, seeks senior researchers, advanced graduate students, or recent Ph.D.'s for 1993-94 Fellowships and Associateships at the National Institute of Standards and Technology (NIST). In particular, the Program seeks Fellows with a strong interest in cross-disciplinary research in process modeling and optimization. Areas of research that fit NIST's research mission and facilities include: statistical approaches in materials processing and measurement; on-line control in automated manufacturing; design of experiments; statistical computing; graphical data analysis; statistical image processing; and design, modeling, and simulation of measurement processes.

Stipends are commensurate with qualifications and experience. Fringe benefits are provided. Appointments are for 3 to 9 months. Applications are due January 15, 1993, for Fellows, and February 15, 1993, for Associates. For application information, contact Carolee Bush, ASA/NSF/NIST Research Program, American Statistical Association, 1429 Duke St., Alexandria, VA 22314-3402; (703) 684-1221. For information on research topics and other aspects of the program contact Ruth Varner, Coordinator, ASA/NSF/NIST Research Program, Statistical Engineering Division, National Institute of Standards and Technology, Admin. Bldg., Room A337, Gaithersburg, MD 20899; (301) 975-2839. EOE.

*** Note from WSS NEWS Editors ***

Items for publication in the November WSS NEWS should be submitted no later than Tuesday, September 29, 1992. Fax items to:

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

A Plea for Quantitative Literacy

The following article appeared on the National Academy Op-Ed Service electronic bulletin board. It was forwarded by Ron Fecso, who is always looking for volunteers for the WSS' Quantitative Literacy efforts. To get involved, call Fecso at (202) 334-2295.

GETTING SCIENTISTS INVOLVED IN SCIENCE EDUCATION

By Ramon E. Lopez

Millions of young Americans barely know the difference between a protein and a proton. In a world that depends on science and technology, they're in big trouble. The irony is that the United States possesses the world's most productive scientific community -- many thousands of people blazing a path in immunology, astrophysics and other fields.

An obvious question is why more of these experts don't help students in local elementary, junior high and high schools to overcome their ignorance of science and become the world's best in the subject by the end of the decade, as President Bush has proposed.

Scientists teaching kids about "real science" might work wonders. Students could hear for themselves how exciting it is to unravel the mysteries of diseases or distant galaxies.

Unfortunately, although scientists complain about science education regularly, they tend to be like most people in not getting involved in something that doesn't affect them directly. Once at a scientific meeting I asked everyone to sign a volunteer list for local schools. One of my colleagues rolled his eyes and said something to the effect of, "Oh, no, Lopez is at it again." Needless to say, he was not interested in helping.

Another reason scientists aren't doing more is that they may come to a school expecting to "fix" a situation they do not really understand.

Well-meaning scientists sometimes believe all educational problems would be solved if only the teachers would listen to them. They fail to recognize that knowing something about chemistry or biology does not make them experts in teaching young people.

Furthermore, some scientists have a poor opinion of teachers and difficulty treating them as equals. The teachers I have known are dedicated, hard-working and intelligent. Given innovative materials and the necessary training and resources, they do an excellent job. What they need is not condescension but support.

Perhaps the biggest underlying problem is that many scientists continue to see science education as a filter for identifying a handful of interested people like themselves rather than as a pump that injects everyone with excitement about science. Such an open approach is especially important with girls and minority students, who now are badly outnumbered in the sciences and must fill the ranks in the future.

Rather than just listening to lectures and memorizing facts, young people should be encouraged to make hypotheses, observe, measure, and draw conclusions on their own -- in other words, to learn science by doing science instead of just reading about it. Even if they don't become scientists, they must know how to evaluate facts and make judgments, skills essential in a democratic society.

Although several obstacles impede scientists from becoming more active, the fact is that a growing number are working hard to help improve local schools. Several scientific organizations have organized efforts to help them.

The National Academy of Sciences and the Smithsonian Institution, for example, have established a National Science Resources Center, which has begun holding workshops that train scientists to assist at schools. The center also brings together scientists and teachers in developing innovative teaching materials, such as kits for experimenting with electric circuits or for cultivating fast-growing plants. Programs elsewhere are helping scientists share their skills in ways students can understand and emulate.

Even scientists who receive this training face a problem. They generally work long hours and survive on grants and contracts of short duration. They must write proposals and publish results. There are few nights and weekends left over for personal projects such as working in local schools. I have heard many colleagues say, "You know, I'd really like to help but just can't find the time."

The heart of the problem, in other words, is not a lack of good intentions but of resources and structure. Scientists could provide schools with expertise and role models to inspire students to raise their sights to the heavens. But they cannot do it alone. They need guidance on how to be truly helpful. They need employers to support their efforts. And they need schools that really want to change. Scientists and parents alike should be demanding reforms like these to produce excellence in science education. Otherwise, our children may grow up to be scientific dimwits in an increasingly scientific world.

Ramon Lopez, Ph.D., a space physicist in the astronomy department at the University of Maryland, College Park, has worked closely with local public schools.

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