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STATISTICAL
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WSS NEWS

November 1993

Quantitative Literacy

The new school year promises another leap in the level of activity for Quantitative Literacy (QL) volunteers. Fairfax County volunteers, having participated in over 125 eighth grade career days last year, received a letter from Ron Zirkle of the Department of Instructional Services of Fairfax County Public Schools thanking them for their "commitment to helping improve the educational experiences of our students in learning about statistics." Zirkle requested that Shail Butani, our Fairfax coordinator, organize a similar effort this year for seventh grade students. In addition, he asked for volunteers to assist classes as they develop survey research projects--a great opportunity for WSS members to contribute their small group consulting skills. For more information, please call Shail Butani at (202) 606-6347.

Long awaited activities in Montgomery County are about to begin! We "got our foot in the door" because Wendy Alvey passed our flyer on to a teacher acquaintance. The teacher called and on September 29, Dwight Brock and I met with teachers from Bethesda and Somerset elementary schools. After listening to their needs, we agreed to develop a three-hour training session on probability and statistics for their elementary school teachers. The teachers need this training because Montgomery County is revising their math curriculum to include statistics concepts in Kindergarden to fifth grade instructions. That evening, we met with available Montgomery County QL volunteers to begin development. Heather Smith and Wendy Rotz agreed to provide another service to Bethesda elementary school, helping them understand a new probability computer program for their eight Mac computers.

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

November		
2	Tues.	An Introduction and Application of Thin Plate Splines: Mapping Muscle Response in the Human Brain
4	Thurs.	Effects of Magnitude and Reliability Information on Detection of Clusters in Mortality Maps
4	Thurs.	**What Respondents Learn from Questionnaires: The Survey Interview and the Logic of Conversation**
9	Tues.	A Critique of Standard Statistical Assumptions, with Reliability Applications or *To IID or Not to IID, That is the Question*!
10	Wed.	Small Domain Estimation (second in a series)
15	Mon.	The Seasonal Adjustment of the Consumer Price Indexes of Women's Apparel: An Application of State Space Model-Based Approach with Intervention Analysis
17	Wed.	Gibbs Sampling with an Application in Estimating Variance Components of the U.S. Consumer Price Index (Latest Presentation in Methodology Seminar Series on Variance Estimation)
19	Fri.	Estimating the Term Structure of Interest with an Exponential Discount Function and Generalized Cross Validation
December		
13	Mon.	**Annual Holiday Party**

Announcements

Quantitative Literacy (Continued)

They will also determine how the computers might fit into the training session. If the training session is successful, they will recommend that we assist in the five-year plan to introduce these concepts to all elementary school teachers in the county. A great training-the-trainer opportunity! Please call our Montgomery County coordinator, Dwight Brock, at (301) 496-9795 if you want to learn more about opportunities to get involved.

We would like to create similar excitement in other counties! To find out how you can help, please call the county coordinator for your area or me (see the flyer in this newsletter for the phone numbers). As a start, you could pass the flyer on to the math teacher at your next PTA meeting or give it to a teacher you know. Don't worry that we will absorb all your scarce free time, most volunteers spend only a few hours once or twice a year (others are very generous with their time) but none that I'm aware of have found the experience anything but a joy. Get involved in raising the awareness and image of your profession--give us a hand **(Ron Fecso, Chair, Quantitative Literacy Group).**

The New Statistics of Income Methodology Report Available

Turning Administrative Systems Into Information Systems: 1991-1992 is the latest volume in a continuation of the IRS' methodology report series which documents technological and methodological changes in Statistics of Income (SOI) programs and other related statistical uses of administrative records. Previous volumes in the series were called *Statistics of Income and Related Administrative Record Research.*

Seven general areas of interest are included in this report: information from tax return data, the 1989 Survey of Consumer Finances, estimation and methodological research in SOI business programs, sample design and weighting issues in the SOI individual program, some quality improvements applications, some technological innovations for SOI research, and a look to the future data needs for the Federal sector.

The report is available free of charge. To obtain a copy, write to: Statistics of Income Division R:S:P, Internal Revenue Service, P. O. Box 2608, Washington, DC 20013-2608, Phone (202) 874-0410, Fax (202) 874-0922.

Joint University of Maryland - University of Michigan Program in Survey Methodology

The Joint University of Maryland - University of Michigan Program in Survey Methodology (JPSM) announces four short courses to be held in the Fall, 1993 and Winter, 1994 in the Washington, DC area, including:

"Introduction to Questionnaire Design," November 17-18, 1993, at the Capital Hyatt taught by Nora Cate Schaeffer;

"Cognitive and Communicative Aspects of Survey Measurement," December 6-7, 1993, at the Capital Hyatt taught by Norbert Schwartz;

"Measurement Errors in Surveys," January 25-26, 1994, at the University of Maryland Conference Center taught by Paul Biemer;

"Self-Administered/Mail Surveys," February 23-24, 1994 at the Capital Hyatt taught by Don Dillman.

Call the JPSM at 1-800-937-9320 for more information about the courses and registration.

Program Abstracts

Topic: An Introduction and Application of Thin Plate Splines: Mapping Muscle Response in the Human Brain

Speaker: Kristen Meier, U.S. Department of Agriculture

Chair: Todd Sahlroot, National Institute of Neurological Disorders and Stroke

Day/Time: Tuesday, November 2, 1993, 1:30 - 3:30 PM **(Please note special time.)**

Location: Federal Building, Room B1-19, 7550 Wisconsin Avenue, Bethesda, MD--Red Line Metro to Bethesda Stop, one-half block North on Wisconsin Avenue.

Sponsor: Public Health and Biostatistics

Abstract: Thin plate splines provide a flexible tool for quantifying a smooth response from "noisy" spatial data. A thin plate spline is a nonparametric estimate of a smooth, continuous, 2-dimensional surface. Such data are encountered in a wide range of applications. For example, in an experiment to determine which areas of the human cortex are most strongly linked with various muscles, magnetic stimuli are applied to a grid of points on a person's scalp and the response is measured in the muscles. Neurological researchers are interested in obtaining a smooth representation of data from such an experiment. That is, they would like to be able to produce a "brainmap" of muscle-neuron associations. This talk will provide a brief introduction to the theory of thin plate splines and show how they can be applied to obtain a map of muscle responses in the human brain.

Program Abstracts (Cont'd)

Topic: Effects of Magnitude and Reliability Information on Detection of Clusters in Mortality Maps

Speaker: Stephen Lewandowsky, University of Oklahoma

Chair: Douglas Herrmann, National Center for Health Statistics

Day/Time: Thursday, November 4, 1993, 10:30 - 12:00 Noon **(Please note special time.)**

Location: National Center for Health Statistics--Presidential Building, 9th Floor, Room 948, 6525 Belcrest Road, Hyattsville, MD

Sponsor: Data Collection Methods Section, WSS and Office of Research and Methodology, NCHS

Abstract: Mortality maps, which display the geographical distribution of deaths from a disease, play an important role in exploring potential epidemiologically relevant environmental or sociological factors. Most public health researchers and epidemiologists are particularly interested in the detection of mortality clusters; that is, distinct areas with a particularly high or low incidence of a disease. In many cases, epidemiologic analyses of this type rely primarily on the visual inspection of statistical maps. Although mathematical cluster detection techniques exist, visual analysis is often preferred because it does not require full knowledge of the correct underlying epidemiologic model. Similarly, attributes such as rivers or political boundaries are difficult to model statistically, but do not pose problems for visual analysis. Until recently, the choice of maps (e.g., choropleth, symbol) has been primarily one of subjective preference. For example, a recent study by Lewandowsky et al. indicated that a multi-hue choropleth map is a viable candidate for the display of mortality information. This and other studies have not answered the question of how to integrate purely quantitative information with information concerning the statistical reliability of the data. This presentation will focus on how readers of mortality maps integrate and interpret these two diverse types of information, based on the results of two recent experiments.

Program Abstracts (Cont'd)

Third Annual Morris Hansen Lecture

Topic: What Respondents Learn from Questionnaires: The Survey Interview and the Logic of Conversation

Speaker: Norbert Schwarz, University of Michigan

Discussants: Eleanor Singer, Columbia University and U. S. Census Bureau
David Cantor, WESTAT, Inc.

Chair: Bob Groves, The Joint University of Maryland-University of Michigan Program in Survey Methodology

Day/Time: Thursday, November 4, 1993, 3:30 p.m. **(Please note special time.)**

Location: Jefferson Auditorium, South USDA Building, 12th Street and Independence, NW Washington, DC (Blue/Orange Line--Smithsonian, Independence Ave. Exit)

Co-Sponsor: National Agricultural Statistics Service, U. S. Department of Agriculture

Welcome: Rich Allen, National Agricultural Statistics Swrvice

Reception: Following the lecture, 5:30-6:30 p.m.

Abstract: From a social-cognitive perspective, the survey interview is best considered as an ongoing conversation that includes the intertwined tasks of question comprehension, recall of information from memory, computation of an answer, and reporting of this answer to an interviewer. The contributions of the interviewer/researcher include apparently formal aspects of the questionnaire, such as the response alternatives provided to respondents, and respondents treat these contributions as they treat any other contribution to an ongoing conversation. That is, they proceed on the basis of the cooperativeness principle that governs the conduct of conversation in everyday life.

This principle holds that every contribution should be relevant to the aim of the ongoing conversation, and that speakers should not provide information that is irrelevant to the task at hand. Moreover, speakers are required to make their contribution informative, that is, to provide information that the recipient needs rather than information that the recipient already has--or may take for granted.

Program Abstracts (Cont'd)

Conforming to these conversational norms requires a considerable degree of inference to determine which information is "informative" in the specific context given. In the survey interview, this context is, in part, constituted by the questionnaire. Apparently formal aspects of questionnaire design, therefore, influence respondents' interpretation of the question, determine which information they use in making a judgment, and which responses they consider appropriate to report.

This framework is applied to the use of open and closed question formats, precoded response alternatives and rating scales, the impact of question order, unintended side-effects of assurances of confidentiality and related issues. Experimental research demonstrates that apparently minor changes of supposedly formal features of questionnaire design may strongly affect the obtained responses, resulting, for example, in differences of up to 30 percentage points in factual reports of behaviors or in correlations of .1 or of .7 between a behavioral report and related attitudes, depending on the choices made at the questionnaire construction stage.

Program Abstracts (Cont'd)

Topic: A Critique of Standard Statistical Assumptions, with Reliability Applications or *To IID or Not to IID, That is the Question*!

Speaker: Harry Ascher, Harold E. Ascher and Associates

Chair: Tom Mazzuchi, George Washington University

Day/Time: Tuesday, November 9, 1993, 5:00 - 6:00 PM **(Please note special time.)**

Location: Staughton Hall, George Washington University, Room 301, 707 22nd Street, NW, Washington, DC (Foggy Bottom/GWU Metro--Blue/Orange lines, on 22nd between G and H Street). Pay parking is available at GWU Marvin Center (800 21st Street--H Street entrance), and at 22nd and Eye Streets garage)

Sponsor: Physical Sciences and Engineering Section

Abstract: The assumptions that any given set of data are independent and identically distributed (IID) are central to most statistical practice. This is hardly surprising, since these assumptions are also central to most statistical theory. If they are questioned at all, the focus is usually on whether or not the data are independent, with virtually no attention paid to the possibility that they are not identically distributed. As important as the independence assumption is, however, the identically distributed assumption is crucial! Put simply: if a set of data is not identically distributed, it is **meaningless** to estimate the "parameters" of a nonexistent distribution. Moreover, most "distribution-free" techniques, which are often assumed to be completely general, are also inapplicable when the data are not identically distributed.

The following examples will be presented to demonstrate the pervasiveness of the **implicit** IID assumptions:

(1) The empirical distribution function is **not** necessarily a strongly consistent estimator of a cumulative distribution function.

(2) The proportion of successes is **not** necessarily a sufficient estimator for "the" probability of success in a sequence of go/no-go trials.

(3) Most reliability texts assume that a repairable system is always renewed by repair. Not only is this assumption unrealistic, it is often **hoped** that it is **not** true!

Program Abstracts (Cont'd)

Topic: Small Domain Estimation (second in a series)

Speaker (s): Wesley L. Schaible, Bureau of Labor Statistics
Michael E. Bellow, National Agricultural Statistics Service

Chair: Phillip S. Kott, National Agricultural Statistics Service

Date/Time: Wednesday, November 10, 1993, 12:30 - 2:00 PM

Location: BLS Cognitive Lab, Postal Square Building, Room 2990, 2 Massachusetts Avenue NE, Washington, DC (Red Line--Union Station). Enter at Massachusetts Ave. and North Capitol St. Federal government employees show ID; nongovernment employees call Ed Riddick at (202) 606-7376 to add name to visitors' list.

Sponsor: Methodology Section

Abstract: Indirect Estimators: Definitions, Characteristics, and Recommendations

Federal Statistical agencies produce estimates for the national population and for many subnational domains. Sample surveys and other data systems designed to produce specified estimates generally incorporate standard, direct estimation methods. When a data system is required to produce estimates other than those for which it was designed, non-standard methods may be required. Indirect or small area estimators, which use values of the variable of interest from units that are not in the domain and time period of interest, are sometimes used in these situations. This presentation summarizes a report by the Subcommittee on Small Area Estimation of the Federal Committee on Statistical Methodology. The definitions of direct and indirect estimators are particularly emphasized. A review of characteristics of indirect estimators and recommendations for producers and users of indirect estimates is included.

Abstract: Crop Area Estimation at the County Level Using Satellite Data

Organizations that perform crop surveys often use remotely sensed data from satellites to improve the efficiency of their estimates. The National Agricultural Statistics Service applies the Battese-Fuller error components model to estimate crop acreage at the county level using both survey and satellite data. In this model, satellite data is treated as an auxiliary variable in a regression estimator with a random county effect. A simpler indirect estimation method, known as pixel count estimation, has recently been proposed that does not employ any error component modelling. In this presentation, the Battese-Fuller estimator will be compared with two types of pixel count estimators.

Program Abstracts (Cont'd)

Topic: The Seasonal Adjustment of the Consumer Price Indexes of Women's Apparel: An Application of State Space Model-Based Approach with Intervention Analysis

Speaker: Raj K. Jain, Bureau of Labor Statistics

Discussant: Nancy Kirkendall, Department of Energy

Chair: Brian Monsell, Bureau of the Census

Day/Time: Monday, November 15, 1993, 12:30 - 2:00 PM

Location: BLS Cognitive Lab, Postal Square Building, Room 2990, 2 Massachusetts Avenue NE, Washington, DC (Red Line--Union Station). Enter at Massachusetts Ave. and North Capitol St. Federal government employees show ID; nongovernment employees call Ed Riddick at (202) 606-7376 to add name to visitors' list.

Sponsor: Economic Section

Abstract: The Consumer Price Indexes of three categories of women's apparel showed substantial level shift in February 1990. The main reason for this shift is attributable to a conscious decision of the BLS in 1990 to price seasonal apparel several months earlier than they used to be priced before the shift. The X-11 ARIMA method of seasonal adjustment together with the prior adjustment for the intervention done by ramp method did not give satisfactory seasonal factors. In this paper, these series are seasonally adjusted by state space models with intervention analysis and ARIMA error structure. The results are compared with those obtained by the X-11 ARIMA and prior ramp adjustment.

Program Abstracts (Cont'd)

Topic: Gibbs Sampling with an Application in Estimating Variance Components of the U.S. Consumer Price Index (Latest Presentation in Methodology Seminar Series on Variance Estimation)

Speaker: Robert M. Baskin, Bureau of Labor Statistics

Chair: Michael P. Cohen, National Center for Education Statistics

Date/Time: Wednesday, November 17, 1993, 12:30 - 2:00 PM

Location: BLS Cognitive Lab, Postal Square Building, Room 2990, 2 Massachusetts Avenue NE, Washington, DC (Red Line--Union Station). Enter at Massachusetts Ave. and North Capitol St. Federal government employees show ID; nongovernment employees call Ed Riddick at (202) 606-7376 to add name to visitors' list.

Sponsor: Methodology Section

Abstract: Gibbs sampling is currently a fashionable approach for estimation purposes. A Gibbs Sampler is a Markov chain which is an iterative updating scheme. It has achieved some success in estimating sets of parameters where, previously, methods were typically unavailable. An introduction to this methodology will be presented. An illustration of the process will be given by an application in estimating variance components for the U.S. Consumer Price Index. Strengths and weaknesses of the methodology will be discussed as well as the model for variance components.

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

Items for publication in the January 1994 WSS NEWS should be submitted no later than November 30, 1993. FAX items to:

Hattie Ramseur or Theresa Hallquist
FAX: (202) 586-0018

Program Abstracts (Cont'd)

Topic: Estimating the Term Structure of Interest with an Exponential Discount Function and Generalized Cross Validation

Speakers: Mark E. Fisher and David Zervos, Federal Reserve Board

Discussant: Jon Faust, Federal Reserve Board

Chair: Arthur Kennickell, Federal Reserve Board

Day/Time: Friday, November 19, 1993, 12:30 - 2:00 P.M.

Location: Room M-3319, Martin Building, Federal Reserve Board--Call Sheila Griffin at (202) 736-5549 to put you name on the guard's list for entry.

Sponsor: Economics Section

Abstract: We estimate the term structure of interest using daily data on Treasury security prices from December 1987 to September 1993. We assume that security prices are approximately equal to the discounted sum of coupon payments and fit the logarithm of the discount function (the integral of the instantaneous forward rate function) with a cubic spline. Rather than arbitrarily choosing the number of parameters for the spline, we explicitly penalize profligate parameterizations and endogenously determine the appropriate number of parameters via generalized cross validation. Our results suggest that fitting a cubic spline to the logarithm of the discount function, rather than the discount function itself produces more stable results, especially for the implied forward rates at longer maturities. Although splining the logarithm involves non-linear estimation techniques, the precision of the estimates is generally higher than that of linear estimations which spline the discount function directly. For the purposes of this study we have developed a set of routines in Mathematica, which perform the estimations and display the resulting yield and forward rate curve graphically. During the presentation we plan to demonstrate the programs with live estimations and displays.

Announcements (Cont'd)

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). SIGSTAT is sponsoring the following meetings: on November 10, 1993, "Axum 3.0", technical graphics package with WYSIWYG graph editor, new features include nonlinear regression and curve fitting and more programming statements; and on December 8, 1993, "S-Plus for Windows", a revisit to the statistical programming language now running under Windows 3.1.

All meetings are scheduled for Wednesdays from 12:30-1:30 p.m. in Room B-14, 1301 New York Avenue NW, Washington, DC. The building is located midway between 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.

Public Data in the 90's

The Association of Public Data Users (APDU) will hold a conference, "Public Data in the 90's: Applications, Opportunities, and Challenges" on November 1-3, 1993. The conference will be held at Sheraton City Centre, 1143 New Hampshire Avenue NW, Washington, DC 20037, (202) 775-0800, near the Foggy Bottom Metro stop. Registration fee for APDU Members is $290, non-members $490. Further information may be obtained by contacting APDU at Telephone: (609) 258-6025, Fax: (609) 258-3943, INTERNET: apdu@pucc.princeton.edu, BITNET: APDU@PUCC.

Employment Column

As a service to local statisticians, *WSS News* provides notification of employment opportunities and description 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 or call: Bill Arends, USDA-NASS, Room 4133 South Building, Washington, DC 20250-2000, (202) 720-6812.

Vacancies

Mathematical Statistician

The U.S. Department of Labor, Unemployment Insurance Service, Benefits Quality Control Program, is seeking a GS-12 mathematical statistician for part-time (16-20 hours per week) employment. The qualifications for this position are: knowledge of and experience in sampling theory and design, and statistical process control methods and procedures; familiarity with Unemployment Insurance and/or social science programs; ability to work with Unemployment Insurance program specialists and advise them on statistical and other technical issues; ability to communicate effectively with other statisticians, programmers, and data analysts; ability to meet deadlines and carry out structured, planned research; and ability to write technical specifications and documentation, summarize findings from survey data, and discuss technical issues and requirements with non-technical audiences or program staff. Applicants can obtain a copy of the position announcement (ETA 93-104 PN) by contacting Alice Becton, U.S. Department of Labor, Employment and Training Administration, Office of Personnel, Room S-5214, 200 Constitution Avenue, NW, Washington, DC 20210; (202) 219-4947.

Employment Column (Cont'd)

Research Analyst/Programmer

Lewin-VHI, Inc. is a nationally-recognized health research and consulting firm that provides services to government policy-makers, private companies, organizations, and associations. Project work will fall mainly into the areas of health care reform, health services utilization, and provider (hospital and physician) payment policy of government and private insurers. Responsibilities include developing portions of analysis plans, carrying out analyses with quality control of results, computer programming, documentation of methods used, and writing results in memos and reports.

Qualifications include: Bachelors or Masters degree in Economics, Statistics, or Public Health/Public Policy with an exceptionally strong quantitative component; minimum three years advanced SAS experience (must be familiar with merging, arrays, and macros) for creation and analysis of databases, as well as knowledge of FORTRAN and JCL; experience with both mainframe and PC-DOS operating systems. Please send cover letter and resume to: Lewin-VHI, Inc., Attn: RJ-WSS, 9302 Lee Highway, Suite 500, Fairfax, VA 22031. No phone calls, please.

Statisticians

Price Waterhouse's Quantitative Methods Group provides Managing Consulting Services to both industry and government clients. Practice areas include sampling, modeling, and survey research applied for a diverse client base. Qualifications for managers include: advanced degree in Statistics or related field, 5 to 7 years experience, preferably in a consulting environment, project management experience, and proposal writing experience. Qualifications for consultants include: degree in Statistics or related field, up to 4 years experience, experience with SAS, excellent oral and written communications skills.

For consideration, forward your resume (no phone calls please), salary requirements, and three references to: Price Waterhouse, Department ST1003A, 1801 K Street NW, Suite 700, Washington, DC 20006.

Job Applicant

Listed below is a brief description of the qualifications of an applicant seeking employment. Employers interested in interviewing an applicant should write or call: Bill Arends, USDA-NASS, Room 4133 South Building, Washington, DC 20250-2000; (202) 720-6812. All requests should include the code number from the applicant's ad and 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.

Applicant #94-03

Experience: 18 years on Capitol Hill dealing with banking, finance, and urban affairs issues. Knowledgeable on all aspects of legislative process and how to lobby effectively. Comprehensive experience with numerous computer applications (including Lotus 1-2-3, Micro-TSP, Windows, Harvard Graphics, WordPerfect, etc.). Able to resolve issues with a minimum of direction and to show initiative. Solid written and verbal communications skills, and the ability to quickly analyze problems and develop options for their solution. This includes ability to define statistical conclusions in layman's terms.

Education: B.S. in Economics (Statistics Major) from the Wharton School, University of Pennsylvania; M.S. in Statistics at Case Western Reserve University.

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		Data Collection Methods			
		Jared Jobe	(301) 436-7111		
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Employment		WSS NEWS Editors		Membership	
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WASHINGTON STATISTICAL SOCIETY

P.O. Box 752
Suitland, MD 20752