



# WSS NEWS

January 2007

WASHINGTON  
STATISTICAL  
SOCIETY

## PH.D. PROGRAM IN STATISTICAL SCIENCE

The Department of Statistics, George Mason University, Fairfax, is currently accepting applications for its new Ph.D. program in Statistical Science, starting Fall 2007. The new program replaces the former Ph.D. program in Information Technology concentration Statistical Science. Competitive teaching and research assistants are available for talented full-time students. All graduate classes are taught after 4:30 p.m. one night per week.

Details can be found on the Department website: <http://statistics.gmu.edu>

## THE JEANNE E. GRIFFITH MENTORING AWARD

On receiving the Roger Herriot Award in June 2001, Jeanne E. Griffith said:

**One of the most rewarding aspects (of Federal statistics) for me was the opportunity to promote creative activities and energies among my staff...When I have had the blessing to mentor young people in their careers, I have tried to emphasize.....(that) only they, themselves, can make the most of (the)....chances that life presents.**

Dr. Griffith died in August 2001 after working for more than 25 years in the Federal statistical system. Throughout her career, and especially in her latter senior management positions at the National Center for Education Statistics and the National Science Foundation, one of Jeanne's *highest* priorities was to mentor and encourage younger staff at all levels to learn, to grow, and to recognize and seize career opportunities as they came along.

The Jeanne E. Griffith Mentoring Award has been established to encourage mentoring of younger staff in the Federal statistical system. It is presented annually, beginning in 2003, to a supervisor who is nominated by co-workers and supervisors, and chosen by the Award Selection Committee.

The award is co-sponsored by the Interagency Council on Statistical Policy, the Council for Excellence in Government, the Washington Statistical Society, the Social Statistics and Government Statistics Sections of the American Statistical Association, and the Council of Professional Associations on Federal Statistics.

Nominations for 2007 will be accepted beginning in February 2007. The last date for submission of nominations is March 30, 2007, and the Award Committee will make its determination of the award winner by May 4, 2007. The award will consist of a \$1000 honorarium and a citation, which will be presented at a ceremony arranged by the co-sponsors in June 2007.

The winning mentor will be selected for his or her efforts in supporting the work and developing the careers of younger staff. Examples of typical mentoring activities include:

- Advising junior staff to help them create career opportunities, networking skills, and contacts for growth and development;

- Counseling junior staff and providing resources to help develop their technical writing, analysis, presentation and organizational skills and knowledge;
- Encouraging junior staff growth and career development through attendance and oral presentations at meetings with higher level officials, staffs of other agencies, professional associations, training courses, and conferences;
- Motivating junior staff and building self confidence through feedback on their efforts, being a listener when that is needed, and creating a caring and supportive environment;
- Serving as a role model for junior staff through professional expertise, information and insights, balancing collegial and personal roles, and including everyone across rank, race, ethnicity, and seniority.

For further information on the award, contact Ed Spar, Council of Professional Associations on Federal Statistics (COPAFS) by phone: 703-836-0404; fax: 703-836-0406; or by e-mail at [copafs@aol.com](mailto:copafs@aol.com). The nomination cover sheet and guidelines form-or a photocopy of it-should be attached to a nomination memorandum or letter. Forms can be obtained by contacting Ed Spar, or by downloading from the COPAFS website at <http://www.copafs.org>. All nominations should be returned to the Jeanne E. Griffith Mentoring Award Committee, c/o COPAFS, 2121 Eisenhower Avenue, Suite 200, Alexandria, VA 22314 no later than March 30, 2007.

## **Nominations Sought for 2007 Julius Shiskin Award**

Nominations are invited for the annual Julius Shiskin Memorial Award for Economic Statistics. The Award is given in recognition of unusually original and important contributions in the development of economic statistics or in the use of statistics in interpreting the economy. Contributions are recognized for statistical research, development of statistical tools, application of information technology techniques, use of economic statistical programs, management of statistical programs, or developing public understanding of measurement issues. The Award was established in 1980 by the Washington Statistical Society (WSS) and is now cosponsored by the WSS, the National Association for Business Economics, and the Business and Economics Statistics Section of the American Statistical Association (ASA). The 2006 award recipient was J. Steven (Steve) Landefeld, Director of the Bureau of Economic Analysis, for his leadership in improving the U.S. economic accounts and related statistics through effective management, collaboration with domestic and international users, and scholarly research.

Because the program was initiated many years ago, it is little wonder that statisticians and economists often ask, "Who was Julius Shiskin?" At the time of his death in 1978, "Julie" was the Commissioner of the Bureau of Labor Statistics (BLS) and earlier served as the Chief Statistician at the Office of Management and Budget (OMB), and the Chief Economic Statistician and Assistant Director of the Census Bureau. Throughout his career, he was known as an innovator. At Census he was instrumental in developing an electronic computer method for seasonal adjustment. In 1961, he published *Signals of Recession and Recovery*, which laid the groundwork for the calculation of monthly economic indicators, and he developed the monthly Census report *Business Conditions Digest* to disseminate them to the public. In 1969, he was appointed Chief Statistician at OMB where he developed the policies and procedures that govern the release of key economic indicators (Statistical Policy Directive Number 3), and originated a *Social Indicators* report. In 1973, he was selected to head BLS where he was instrumental in preserving the integrity and independence of the BLS labor force data and directed the most comprehensive revision in the history of the Consumer Price Index (CPI), which included a new CPI for all urban consumers.

Nominations for the 2007 award are now being accepted. Individuals or groups in the public or private sector from any country can be nominated. The award will be presented with an honorarium of \$750 plus additional recognition from the sponsors. A nomination form and a list of all previous recipients are available on the ASA Website at <[www.amstat.org/sections/bus\\_econ/shiskin.html](http://www.amstat.org/sections/bus_econ/shiskin.html)> or by writing to the Julius Shiskin Award Committee, Attn: Monica Clark, American Statistical

Association, 732 North Washington Street, Alexandria, VA 22314-1943.

Completed nominations must be received by April 1, 2007. For further information contact Steven Paben, Julius Shiskin Award Committee Secretary, at paben.steven@bls.gov.

## **WSS and Other Seminars**

(All events are open to any interested persons)

### January

- 9 Tues. ROC Analysis of the Multiple-Biomarker Classifier Training and Testing Problem: The Influence Function and Specification of Uncertainties in ROC Summary Measures
- 12 Fri. Parameter Estimation for the Exponential-Normal Convolution Model for Background Correction of Affymetrix GeneChip Data
- 19 Fri. Considerations in Adapting Clinical Trial Design for Drug Development
- 29 Mon. Economic Turbulence in the U.S. Economy

### February

- 6 Tues. Mortality in Iraq

### March

- 8 Thur. Measurement and Statistical Analysis of Human Rights: A Model
- 28 Wed. Applications of the Johnson SB Distribution to Environmental Data

Also available on the Web at the following URL: <http://www.scs.gmu.edu/~wss/>

## **Announcement**

### **JUDGES FOR THE 2007 SCIENCE FAIRS**

Volunteers are needed to represent the Washington Statistical Society next spring as judges in five regional science fairs in Northern Virginia, suburban Maryland, and the District of Columbia. Since 1986, WSS has provided special awards at these fairs to students whose projects demonstrate excellence in data analysis or the application of statistical methods. Those who have participated in this activity have very much enjoyed the opportunity to interact with the students and to observe the widely diverse projects which are presented. The fairs are held on Saturday mornings in mid-March to mid-April. The only time required is that one Saturday morning, plus one weekday lunchtime meeting to discuss judging strategy.

If you would like to be a science fair judge next spring, please e-mail Robert Clickner at Robertclickner@westat.com by February 2, and include your e-mail address, work and home phone numbers, your fax number and your mailing address. If you judged last spring, there is no need to contact Bob unless your e-mail address or phone number has changed. If you have any questions, please call Bob at 301-294-2815.

## Announcement

### **SIGSTAT Topics for January 2007 – February 2007**

#### **January 17, 2007: SAS/LE (SAS Learning Edition 4.1)**

The SAS Learning Edition is an inexpensive (\$199.00) and easy-to-use (comes with the Enterprise Guide menu-based interface) version of SAS with an impressive array of features from SAS Base 9,1,3, SAS/STAT, SAS/GRAPH, SAS/QC, SAS/ETS and SAS Enterprise Guide 4.1. For statisticians, some of the included PROCs are MIXED, GENMOD, ARIMA, GLM, REG, LOGISTIC, and PHREG. See <http://support.sas.com/training/le/> for more information.

SAS/LE will read datasets of any size, but will only process the first 1,500 observations. There is no limitation on the number of variables. Charlie Hallahan will be the speaker.

#### **February 21, 2007: Demo of SPSS Complex Samples**

SPSS Complex Samples, an add-on module for SPSS for Windows®, provides the specialized planning tools and statistics you need when working with sample survey data. It enables you to make more statistically valid inferences for a population by incorporating the sample design into survey analysis. You can more accurately work with numerical and categorical outcomes in complex sample designs using two new algorithms for analysis and prediction. This presentation will demo the software and analysis wizards using tutorials and sample data sets provided with the module.

See [http://www.spss.com/complex\\_samples/](http://www.spss.com/complex_samples/) for more information. Linda Atkinson will be the speaker.

**SIGSTAT** is the Special Interest Group in Statistics for the **CPCUG**, the Capital PC User Group, and **WINFORMS**, the Washington Institute for Operations Research Service and Management Science.

All meetings are in Room S3031, 1800 M St, NW from **12:00 to 1:00**. Enter the South Tower & take the elevator to the 3<sup>rd</sup> floor to check in at the guard's desk.

First-time attendees should contact Charlie Hallahan, 202-694-5051, [hallahan@ers.usda.gov](mailto:hallahan@ers.usda.gov), and leave their name. Directions to the building & many links of statistical interest can be found at the **SIGSTAT** website, <http://www.cpcug.org/user/sigstat/>.

#### **Note from the WSS NEWS Editor**

Items for publication in the March issue of the WSS NEWS should be submitted no later than January 30, 2007. E-mail items to Michael Feil at [michael.feil@usda.gov](mailto:michael.feil@usda.gov).

## Program Announcement

- Title:** **ROC Analysis of the Multiple-Biomarker Classifier Training and Testing Problem: The Influence Function and Specification of Uncertainties in ROC Summary Measures**
- Speaker:** Waleed A. Yousef, D.Sc.,  
George Washington University and  
Center for Devices and Radiological Health (CDRH) FDA.  
wyousef@gwu.edu
- Co-investigators:**
- Robert F. Wagner, Ph.D.  
FDA Center for Devices and Radiological Health  
robert.wagner@fda.hhs.gov
- Murray H. Loew, Ph.D.  
George Washington University  
loew@gwu.edu
- Chair:** Robert F. Wagner, Ph.D.
- Discussant:** Grant Izmirlian, Ph.D.  
NCI Division of Cancer Prevention
- Date/Time:** Tuesday, January 9, 2007 / 12:30 to 2:00 p.m.
- Location:** NIH's Executive Plaza complex. Executive Plaza North, Conference Room 319, 6130 Executive Boulevard, Rockville, Maryland; pay parking is available. Check with security upon entry—photo ID required.
- Sponsor:** WSS Section on Public Health and Biostatistics
- Abstract:** One of the central biomedical issues for our time is the identification and fusion of multiple biomarkers for a specified diagnostic task. The fusion stage can be recognized immediately as a special case of the problem of statistical learning. That is, one trains a statistical learning machine (SLM) with cases whose health status or outcome is already known and then tests the learning machine on cases previously unseen. Almost all investigators of SLMs are familiar with early optimism, tempered by later experience. Assessment methods are needed that provide estimates not only of mean performance, but also of uncertainties associated with the finite size of the training and testing samples. Taking the work of Efron and Tibshirani as a point of departure, we have developed methods for calculating the statistical influence function for figures of merit based not only on probability of misclassification but also on the full receiver operating characteristic (ROC)—or true-positive versus false-positive rate—and several of its summary measures and their uncertainties. These methods have broad applicability across most diagnostic fields that plan to use multiple biomarkers and, in particular, are useful for designing a target database size based on a pilot study.

## Program Announcement

**Title:** **Parameter Estimation for the Exponential-Normal Convolution Model for Background Correction of Affymetrix GeneChip Data**

**Speaker:** Monnie McGee, Ph.D.  
Assistant Professor  
Department of Statistical Science  
Southern Methodist University  
Dallas, Texas

**Date/Time:** Friday, January 12, 2007 / 10:00 to 11:00 a.m. (refreshments will be served at 9:45)

**Location:** Georgetown University. Lombardi Comprehensive Cancer Center, 3800 Reservoir Road, NW. New Research Building, E501 Conference Room Washington, DC 20057. Phone: 202-687-4114

**Abstract:** There are many methods of correcting microarray data for non-biological sources of error. Authors routinely supply software or code so that interested analysts can implement their methods. Even with a thorough reading of associated references, it is not always clear how requisite parts of the method are calculated in the software packages. However, it is important to have an understanding of such details, as this understanding is necessary for proper use of the output, or for implementing extensions to the model.

In this paper, the calculation of parameter estimates used in Robust Multichip Average (RMA), a popular preprocessing algorithm for Affymetrix GeneChip brand microarrays, is elucidated. The background correction method for RMA assumes that the perfect match (PM) intensities observed result from a convolution of the true signal, assumed to be exponentially distributed, and a background noise component, assumed to have a normal distribution. A conditional expectation is calculated to estimate signal. Estimates of the mean and variance of the normal distribution and the rate parameter of the exponential distribution are needed to calculate this expectation. Simulation studies show that the current estimates are flawed; therefore, new ones are suggested. We examine the performance of preprocessing under the exponential-normal convolution model using several different methods to estimate the parameters.

## **Program Announcement**

- Title:**           **Considerations in Adapting Clinical Trial Design for Drug Development**
- Speaker:**       H.M. James Hung, Ph.D.  
Director, Division of Biometrics I  
Office of Biostatistics  
Office of Translational Sciences  
Center for Drug Evaluation and Research  
Food and Drug Administration
- Date/Time:**     Friday, January 19, 2007 / 10:00 to 11:00 a.m. (refreshments will be served at 9:45)
- Location:**       Georgetown University. Lombardi Comprehensive Cancer Center, 3800 Reservoir Road, NW. New Research Building, E501 Conference Room Washington, DC 20057. Phone: 202-687-4114
- Abstract:**       Enhancing flexibility of clinical trial designs is one of the hot topics nowadays. Proper adaptation of clinical trial design is one of the ways for achieving this goal and has drawn much attention from clinical trialists. In past decades, the classical design has been improved to allow the flexibility for terminating the trial early if the experimental treatment is proven effective or deemed harmful or futile, based on the data accumulating during the course of the trial. Statistical validity of such an enhanced design in terms of type I error is maintained. The operational aspects of this design can still be an issue but, by and large, there have been many good models for how to deal with these aspects. As the flexibility of trial design is enhanced further, the potential risk that the resulting trial may not be interpretable increases. In this presentation we shall share our review experience, discuss the many issues arising from use of more flexible designs and hopefully stimulate further research in this area.

## Program Announcement

- Title:** Economic Turbulence in the U.S. Economy
- Speaker:** Julia Lane, NORC/University of Chicago
- Discussants:** Jared Bernstein, Economic Policy Institute  
Ralph Rector, The Heritage Foundation
- Chair:** Linda Atkinson, Economic Research Service, USDA
- Date/time:** Monday, January 29, 2007 / 12:30 to 2:00 p.m.
- Location:** Bureau of Labor Statistics Conference Center in G440. To be placed on the seminar attendance list at the Bureau of Labor Statistics you need to e-mail your name, affiliation, and seminar name to [wss\\_seminar@bls.gov](mailto:wss_seminar@bls.gov) (underscore after `wss`) by noon at least 2 days in advance of the seminar or call 202-691-7524 and leave a message. Bring a photo ID to the seminar. BLS is located at 2 Massachusetts Avenue, NE. Take the Red Line to Union Station.
- Sponsor:** WSS Economics Section
- Abstract:** Turbulent change is the hallmark of the U.S. economy, and one of the reasons for its success. Every week, in every part of the economy, and in every corner of the country, some firms are shutting down and others are starting up, some jobs are being created and others are being destroyed, some workers are being hired and others are quitting or being laid off.
- The presentation will summarize the analysis from a new book "Economic Turbulence" derived from the use of the LEHD data at the Census Bureau, as well as from interviews with firms and workers in each industry.
- Three key topics will be discussed:
1. Firm performance and survival: What is the relationship between workforce quality, turnover, and firm survival?
  2. Worker career paths: What impact do firms have on workers' career paths? What is the long run impact of firm stability and instability on a worker's earnings growth?
  3. Wage distribution: What has happened to worker earnings over time? What has happened to middle, low, and high income jobs? Do new firms pay more or less than old?



## Program Announcement

- Title:** Mortality in Iraq
- Chair:** Dr. Graham Kalton, Westat
- Speakers:** Dr. Gilbert Burnham, Center for Refugee and Disaster Response, Bloomberg School of Public Health, JHU  
Ms. Shannon Doocy, Center for Refugee and Disaster Response, Bloomberg School of Public Health, JHU  
Dr. Scott Zeger, Dept of Biostatistics, Bloomberg School of Public Health, JHU
- Discussants:** Jana Asher, AAAS and Dr. David Marker, Westat
- Date:** Tuesday, February 6, 2007
- Time:** **2:00 pm to 4:30 pm (please note the atypical start time, light refreshments will follow the seminar)**
- Location:** Bureau of Labor Statistics, Conference Center in Room 1 & 2  
To be placed on the seminar list attendance list at the Bureau of Labor Statistics you need to e-mail your name, affiliation, and seminar name to [wss\\_seminar@bls.gov](mailto:wss_seminar@bls.gov) (underscore after 'wss') by noon at least 2 days in advance of the seminar or call 202-691-7524 and leave a message. Bring a photo ID to the seminar. BLS is located at 2 Massachusetts Avenue, NE. Use the Red Line to Union Station.
- Sponsor:** Methodology and Human Rights sections of the WSS, Science and Human Rights Program of AAAS, DC-AAPOR, and CASPA
- Abstract:** In unstable situations, population based data are the most reliable method of estimating mortality and other health indicators. In many conflicts and fragile state settings, however, collecting such data is difficult to do. Aside from the physical dangers, there is often an incomplete understanding of population numbers, population locations, migration patterns, and health status of the population. That lack of understanding contributes to many methodological challenges. However, population based data are increasingly important in planning protection of and assistance to affected populations, as well as for reconstruction policy.
- In Iraq we have undertaken two population-based national surveys of mortality related to conflict using a cluster survey approach. The first covered the period from January 2002 until July 2004, using 33 clusters with 988 households and 7,868 persons. That survey estimated an excess mortality of over 100,000 persons following the March 2003 invasion. The second survey covered the period from January 2002 until July 2006. That survey included 47 clusters containing 1,849 households and 12,801 persons. From that survey an excess mortality of 654,965 (CI 392 797-942 636) was estimated, with 601,027 deaths attributed to violent causes.
- The presentations will discuss the methodological and ethical issues involved in conducting our research in Iraq.

## **Program Announcement**

- Title:** Measurement and Statistical Analysis of Human Rights: A Model
- Speaker:** Brian J. Grim, Ph.D.  
Senior Research Fellow, Religion and World Affairs  
Pew Forum on Religion & Public Life  
1615 L Street, NW, Suite 700  
Washington, DC 20036  
bgrim@pewforum.org
- Date/Time:** Thursday, March 8, 2007/ 12:30 to 2:00 p.m.
- Location:** Bureau of Labor Statistics, Conference Center in Room 9. Bring a photo ID to the seminar. BLS is located at 2 Massachusetts Avenue, NE. Use the Red Line to Union Station.
- Sponsors:** WSS Human Right's, AAAS, and DC-AAPOR
- Abstract:** The study of human rights violations and the development of statistical models that can offer explanations are severely handicapped by a lack of adequate data. Most information on human rights is embedded in qualitative reports. Quantitative data that do exist tend to be limited to rough counts of violations or numeric indexes with little if any methodological transparency. This presentation will describe an extensive and rigorous coding project which uses the annual U.S. State Department's *International Religious Freedom Reports* as the primary information source and the procedures developed to check the coded data against alternative sources. The usefulness of these coded data will be demonstrated by testing an explanatory theory of religious persecution using structural equation modeling. The presentation will conclude with a discussion of how this research could be extended to the measurement and statistical analysis of other human rights.

## Program Announcement

- Title:** Applications of the Johnson SB Distribution to Environmental Data
- Speaker:** David T. Mage, (Retired), Institute for Survey Research, Temple University
- Chair:** Mel Kollander
- Date/time:** Wednesday, March 28, 2007 / 12:30 to 1:30 p.m.
- Location:** Bureau of Labor Statistics Conference Room 1. To be placed on the seminar list attendance list at the Bureau of Labor Statistics you need to e-mail your name, affiliation, and seminar name to wss\_seminar@bls.gov (underscore after 'wss') by noon at least 2 days in advance of the seminar or call 202-691-7524 and leave a message. Bring a photo ID to the seminar. BLS is located at 2 Massachusetts Avenue, NE. Use the Red Line to Union Station.
- Sponsor:** WSS Agriculture and Natural Resources Section
- Abstract:** In analyzing environmental data, it is common practice to assume that such data are from a 2-parameter lognormal if right skew and from a normal distribution if symmetrical. It is not generally recognized that the Johnson SB Distribution provides a continuum of distributions between the normal and lognormal distributions that constitute SB asymptotes. The Johnson SB transforms experimental data bounded by a minimum value ( $X_{min}$ ) and a maximum value ( $X_{max}$ ) into a normally distributed variable  $Y = \ln [(x - X_{min}) / (X_{max} - x)]$  which is bounded as  $-\infty < Y < +\infty$ . As  $X_{max}$  goes to  $+\infty$  and  $X_{min}$  goes to 0, the distribution is asymptotically 2-parameter lognormal. As  $X_{max}$  goes to  $+\infty$  and  $X_{min}$  goes to  $-\infty$  the distribution is asymptotically normal.
- Methods of objectively determining 4 optimal parameters for the SB distribution ( $X_{min}$ ,  $X_{max}$ ,  $\mu$ ,  $\sigma$ ) by the maximum likelihood estimation procedures are reviewed. Bruce Hill (1963) showed that the maximum likelihood solution for the three parameter lognormal yields degenerate and absurd solutions as  $X_{min}$  goes in the limit to the minimum observation; the likelihood of the minimum observation tends to infinity, as the likelihood of all other observations tend to zero. Although somewhat surprising, Hill's result conforms with known general problems with likelihood methods when the support points of the probability distribution are a function of the parameters of the distribution, in this case the parameters  $X_{min}$  and  $X_{max}$ . Several modifications of the maximum likelihood methods are proposed. It is also shown that for the standard likelihood function a local maximum occurs within natural parameter space.
- Different methods of resolving this problem are discussed along with other methods of obtaining the SB parameters, by fitting to 4 percentiles, by method of moments, and by a graphical technique that plots the data and minimizes the Kolmogorov-Smirnov statistic.

## Announcement

### MATH 503: Mathematical Statistics (Spring 2007) Course Information and Syllabus

Instructor: Dr. Kimberly Sellers  
Room 340, St. Mary's Hall  
202-687-8829  
[kfs7@georgetown.edu](mailto:kfs7@georgetown.edu)

Lecture: Thursdays, 6:15-8:45pm (St. Mary's 110)  
Office hours: Thursdays, 4-6pm (St. Mary's 340)  
Required Text: Hogg, McKean, Craig (2005) *Introduction to Mathematical Statistics, Sixth Edition.*

#### Course Overview:

This is a course in the mathematical theory of statistical inference. The emphasis is on frequentist methods, with appropriate attention also to Bayesian methods. Topics include principles of data reduction (sufficiency and sufficient statistics, likelihood, invariance), construction of point estimates (method of moments, maximum likelihood, Bayes estimators), criteria for point estimation (mean squared error, unbiasedness, consistency), construction of hypothesis tests, some asymptotic properties of point estimators, criteria for hypothesis tests (error probabilities and power, most powerful tests, bias), asymptotics of some large sample tests, construction of and criteria for interval estimates, elements of decision theory and applications to statistical inference (Bayes rules, minimax), elements of the analysis of variance (one-way ANOVA, F-test, contrasts), elements of linear regression (least squares, tests for model parameters, pointwise and simultaneous estimation and prediction. If time permits: More on asymptotic of estimators, exact and approximate tests for contingency tables, some nonparametric tests (sign test, rank sum test), more on ANOVA.

#### Course Organization:

1. Lecture: Class time will include concepts from the textbook (*Introduction to Mathematical Statistics, 6<sup>th</sup> edition*) in lecture format and discussion of SAS where appropriate. You will be expected to learn the concepts found in both the lectures *and* assigned/associated readings.

Lecture notes are to be downloaded and printed *in advance* of the scheduled lecture. This will aid you in following the lecture presentation. Copies of lecture notes will not be supplied in class; therefore, it is your responsibility to come prepared. Note that you will not be able to truly benefit from the lecture notes merely by downloading them from the web. The notes are designed to be interactive during class time.

2. Homework: There will be weekly homework assignments that include mathematical problems, proofs, and data analysis. Some assignments will make use of the computer package, SAS. The assignments will be found on the web and usually due on Thursdays at the beginning of lecture, unless otherwise noted on the website. You are allowed and even encouraged to discuss the assignments with each other, but the work that you hand in **MUST BE YOUR OWN**. This means that each student must perform all analyses on his/her own computer, and must independently write up the analysis. Plagiarism will be swiftly dealt with to the full extent allowed under Georgetown policies on cheating and plagiarism (see [http://gervaseprograms.georgetown.edu/hc/standards\\_of\\_conduct.html](http://gervaseprograms.georgetown.edu/hc/standards_of_conduct.html)).

3. Exams: There are two midterm exams and a final exam. The examinations will be closed book and closed notes.

4. Web page: The course outline, lecture notes, necessary data, homework assignments and solutions, labs, and supplementary material for this course can be found on Blackboard (located at <http://campus.georgetown.edu>). Lecture notes are to be downloaded and copied prior to class lecture so that you may easily follow the discussion. Homework assignments will be available for retrieval at least one week prior to their due date. Any additional announcements that are made over the course of the semester will also be found/updated on the website.

5. Grading:	Homework:	30% total
	Midterm exam 1:	20%
	Midterm exam 2:	20%
	Final exam:	30%
	Total:	100%

## Announcement

### SHORT COURSES PRESENTED BY THE JOINT PROGRAM IN SURVEY METHODOLOGY

JPSM HOME PAGE: [www.jpsm.org](http://www.jpsm.org) Click on "Short Courses"

SPONSOR AFFILIATE LIST:

<https://projects.isr.umich.edu/jpsm/sponsorlist.cfm>

COURSE LISTS, INFORMATION, REGISTRATION, PAYMENT AND CANCELLATION:

<https://projects.isr.umich.edu/jpsm/>

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January 18-19, 2007 (Open for Registration) Methods for Testing Survey Questions Pamela Campanelli Registration Deadline: January 4, 2007

Information:

<https://projects.isr.umich.edu/jpsm/materials/2007-0118.html>

February 13-14, 2007 (Open for Registration) Balancing Data Confidentiality and Data Quality Lawrence Cox Registration Deadline: January 29, 2007

Information:

<https://projects.isr.umich.edu/jpsm/materials/2007-0213.html>

February 26-27, 2007 (Open for Registration) Introduction to Survey Estimation David Morganstein and Richard L. Valliant Registration Deadline: February 12, 2007

Information:

<https://projects.isr.umich.edu/jpsm/materials/2007-0226.html>

March 15-16, 2007 (Forthcoming)

Introduction to Survey Sampling

Colm O'Muircheartaigh and Roger Tourangeau

Information: Forthcoming

March 27, 2007 (Forthcoming)

Introduction to National Accounts

Barbara Fraumeni

Information: Forthcoming

April 12-13, 2007 (Open for Registration) Questions for Standardized Measurement in Surveys Nora Cate Schaeffer Registration Deadline: March 29, 2007

Information:

<https://projects.isr.umich.edu/jpsm/materials/2007-0412.html>

May 15-16, 2007 (Forthcoming)

Analysis and Presentation of Economic Data Katharine G. Abraham and Deborah P. Klein

Information: Forthcoming

May 22-23, 2007 (Forthcoming)

Applied Structural Equation Modeling

Patrick Sturgis

Information: Forthcoming

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JPSM HOME PAGE: [www.jpsm.org](http://www.jpsm.org) Click on "Short Courses"

**SPONSOR AFFILIATE LIST:**

<https://projects.isr.umich.edu/jpsm/sponsorlist.cfm>

**COURSE LISTS, INFORMATION, REGISTRATION, PAYMENT AND CANCELLATION:**

<https://projects.isr.umich.edu/jpsm/>

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**APPLIED STRUCTURAL EQUATION MODELING**

A two-day short course sponsored by the Joint Program in Survey Methodology

MAY 22-23, 2007

Presented at the Sheraton Crystal City Hotel, Arlington, VA

**PATRICK STURGIS**

University of Surrey, UK

**COURSE OBJECTIVES**

This course will focus on the application of structural equation modeling (SEM) techniques to substantive research questions. Structural Equation Modeling (SEM) is a powerful and flexible approach to modeling a broad range of data types and formats. It combines aspects of measurement theory, latent variable modeling, simultaneous equations and path analysis, within a single modeling framework. It can be used for analyzing both cross-sectional and longitudinal data. This course will provide an introduction to what SEM is and what it can be used for by substantive analysts across the social sciences and across a range of sectors. The focus of the course is on the application of structural equation models for addressing real substantive questions. At the conclusion of the course participants will:

- Be able to understand key terms, concepts and the 'philosophy' of SEM
- Be able to 'read' path diagrams
- Understand and know how to estimate mediational/indirect effects
- Understand the logic and implementation of multiple group models
- Understand how SEM can be used to model categorical outcome variables
- Understand how to fit SEM in the presence of missing data - Be familiar with the Amos user environment
- Understand how SEM can be applied to repeated measures/panel data

Although the course will not contain lab classes, there will be exercises and demonstrations to underpin lecture presentations. Course participants will receive a workbook containing all material presented in the lectures and classes, plus additional reading lists and weblinks.

**WHO SHOULD ATTEND**

The course is intended for persons involved in quantitative data analysis in government, commercial, and academic sectors. The presentation of material will be aimed predominantly at the conceptual rather than the mathematical level. The course assumes a basic working knowledge of the general linear model and probability theory. Some familiarity with factor analysis would be advantageous, though not a requirement.

**THE INSTRUCTOR**

Dr Patrick Sturgis is associate professor in quantitative sociology in the Department of Sociology, University of Surrey. His research interests are in the areas of public opinion, statistical modeling and survey methodology, with a particular focus on longitudinal surveys. He teaches survey methodology and statistical modeling at both undergraduate and postgraduate level and has published widely on different aspects of survey design and analysis. He is an Associate Fellow of the Southampton Social Statistics Research Institute (S3RI) and associate editor of the journal 'Survey Research Methods'. He is Principal Investigator on a 2 year UK Economic and Social Research Council project 'Social and Political Trust: A Longitudinal and Comparative Perspective'.

**TENTATIVE SCHEDULE**

**TUESDAY, MAY 22, 2007**

- 8:00 - 9:00 Registrant Check-in and Continental Breakfast
- 9:00 - 9:15 Introduction: Aims and Objectives of the course
- 9:15 - 10:15 Structural Equation Modeling: what is it and what can we use it for?
- 10:15 - 10:30 Morning Break

10:30 - 11:45	Measuring concepts 1: Overview of foundational ideas, terms and concepts; matrices; estimation; parameter constraints; 'reading' path diagrams; model identification
11:45 - 12:45	Lunch Break
12:45 - 2:00	The 2-step model; Exploratory v Confirmatory Factor Analysis
2:00 - 3:00	Measuring concepts 2: Assessing model fit, exact v approximate fit; nested models; model modification, modification indices, correlated error variances
3:00 - 3:15	Afternoon Break
3:15 - 4:00	The structural model 1: Exogenous and endogenous variables; multiple indicators multiple causes (MIMIC) model; mediational models, direct, indirect and total effects
4:00 - 5:00	SEM exercise: turning a theory into a path diagram; assessing the identification status of models.
5:00	Adjourn

WEDNESDAY, MAY 23, 2007

8:00 - 9:00	Registrant Check-in and Continental Breakfast
9:00 - 9:15	Review of Day 1
9:15 - 10:30	Multiple Group Analysis: Modeling sub-populations; factorial invariance; mean structures.
10:30 - 10:45	Morning Break
10:45 - 11:45	Extending the structural model: Categorical endogenous variables; missing data.
11:45 - 12:45	Lunch Break
12:45 - 2:15	Multi-level SEM: Clustered observations; variance components; cross level interactions.
2:15 - 2:45	Worked Example using Amos
2:45 - 3:00	Afternoon Break
3:00 - 4:00	SEM for longitudinal data 1: Types of panel data; the simplex model; cross-lagged panel models; correlated disturbances.
4:00 - 5:00	SEM for longitudinal data 2: Treating time more flexibly; the latent growth curve model; fixed v random effect estimators; hybrid models
5:00	Adjourn

**CALCULATOR**

Registrants should bring a calculator to the course on both days.

**COURSE MATERIALS**

Registrants will be provided with a course pack containing course notes.

**MEALS**

JPSM group continental breakfasts, lunches and breaks are included in the course fee.

**JPSM SPONSOR AFFILIATE LIST:**

<https://projects.isr.umich.edu/jpsm/sponsorlist.cfm>

**FEES**

The registration fee for staff at sponsoring agencies and affiliates is \$550, \$550 for full-time university students, and \$730 for other participants. Payment by credit card is required. Post registration payment may be done online using the registration number or by calling (800) 937-9320. Payment is required by May 8, 2007.

**REGISTRATION**

Online registration is required. Confirmation of acceptance will be sent after the registration form has been processed. Registration is not firm until you receive an acceptance email. The email will include directions to the course. The automatic web registration number is not an acceptance letter. Payment by credit card is required. Post registration payment may be done online using the web generated registration number or by calling (800) 937-9320. The registration deadline is May 8, 2007.

**CANCELLATION**

Please notify JPSM as soon as possible if you need to cancel your registration. Cancellation requests should be done online. You will be fully reimbursed if you cancel by May 8, 2007. Cancellation May 9-14, 2007 will require a \$100 administrative fee, the remainder will be reimbursed. Cancellation on or after May 15, 2007 is subject to the full fee amount.

**LOCATION**

The course will be held at the Sheraton Crystal City Hotel, 1800 Jefferson Davis Highway, Arlington, Virginia. The Sheraton Crystal City Hotel is located in the "Crystal City" business district of Arlington, with nearby access to the Crystal City Metro Stop. Located at the intersection of 18th and Eads Street the hotel is 1 mile from Ronald Reagan National Airport. For room reservations call the hotel at (703) 486-1111 or 1-800-862-ROOM. Information, directions, and times will be sent with your acceptance email letter.

#### MINORITY FELLOWSHIPS

The Joint Program in Survey Methodology strives to increase the number of survey professionals from groups traditionally under-represented in the field. As part of this effort, a limited number of competitive minority fellowships are available to African-Americans, Hispanic Americans, and Native American Indians for the short course. Applicants should submit:

- (1) A 500-word essay describing their reasons for wanting to attend this short course and how their participation will enhance their chosen career path. The essay should indicate the applicant's race/ethnic background.
- (2) A recommendation written by a person knowledgeable about the applicant's aptitude and interest in survey methodology.
- (3) The course registration form.

If you are applying for a minority fellowship, please be certain to register early. Applications are due before April 24, 2007. JPSM will evaluate the applications and inform the successful applicants by May 1, 2007. The fellowship covers the registration fee for the course, including the cost of materials to be distributed during the course and lunch.

#### JPSM CITATION PROGRAMS

The citation programs are built around the JPSM short courses. The JPSM Citation in Introductory Survey Methodology is designed to provide the working professional and interested students with state-of-the-art knowledge about current principles and practices for conducting complex surveys combined with practical skills of day-to-day utility. The JPSM Citation in Introductory Economic Measurement is designed for professional staff requiring a grounding in the principles and practices of economic measurement. Completion of the citation programs involves taking a semester-length JPSM credit-bearing course and eight JPSM short courses, of which four are specified core courses. For information on the Certificate and Citation Programs visit the website at <http://www.jpsm.org> or call 301-314-7911.

#### INQUIRIES

Questions for this course should be directed to the JPSM Short Course, Institute for Social Research, University of Michigan, 426 Thompson Street, Room 4050, Ann Arbor, MI 48104-2321, Phone: (800) 937-9320,

Fax: (734) 764-8263, Email: [jpsmshort@isr.umich.edu](mailto:jpsmshort@isr.umich.edu) .

JPSM HOME PAGE: <http://www.jpsm.org> Click on "Short Courses"

JPSM SPONSOR AFFILIATE LIST:

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CLASS INFORMATION, REGISTRATION, PAYMENT AND CANCELLATION:

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Primary Funding for JPSM is from the Interagency Council on Statistical Policy



## Employment

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 email or call Anne Peterson, at [apeterson@insightpolicyresearch.com](mailto:apeterson@insightpolicyresearch.com) or (703) 373-6645.

### **JOB ANNOUNCEMENT: NATIONAL SCIENCE FOUNDATION**

CHIEF STATISTICIAN, AD-5/1529. Annual salary ranges from \$129,026 to \$152,000.

The position is excluded from the bargaining unit.

Permanent positions apply under NSF Announcement Number E20070026.

One or two year visiting scientist appointments, Intergovernmental Personnel Act (IPA) assignments, or federal temporary appointments apply under NSF Announcement Number E20070027-Rotator.

[http://www.nsf.gov/about/career\\_opps/vacancies/scientific.jsp](http://www.nsf.gov/about/career_opps/vacancies/scientific.jsp)

The Division of Science Resources Statistics (SRS) in the National Science Foundation (NSF) is one of the fourteen (14) major statistical agencies within the federal government. The primary objective of SRS is to develop statistical and analytical information on the U.S. science and engineering enterprise. The Chief Statistician provides statistical guidance and leadership to SRS staff in the areas of survey design and redesign, survey methodology, and mathematical statistics and is the Confidentiality Officer for SRS.

Closing date: January 29, 2007

### **GEORGETOWN UNIVERSITY MEDICAL CENTER FACULTY BIOSTATISTICIAN DEPARTMENT OF BIOSTATISTICS, BIOINFORMATICS AND BIOMATHEMATICS**

The Department of Biostatistics, Bioinformatics and Biomathematics invites applications for a position of tenure-track assistant professor of Biostatistics. Applicants should have a Ph.D. in Biostatistics, Statistics, or a related discipline, a strong interest and expertise in the application of statistical methodology in social and behavioral sciences. The requirements for this position are a strong research background, excellent communication skills and an interest in teaching. The successful candidate will collaborate with social and behavioral scientists from the Medical Center, conduct independent biostatistical research, and teach in our Master's degree program.

Interested individuals should send a letter of application, curriculum vitae, and the names and addresses (including e-mail address) of three references to:

Françoise Seillier-Moiseiwitsch, Chair  
Department of Biostatistics, Bioinformatics, and Biomathematics  
Georgetown University Medical Center  
Building D, Suite 180  
4000 Reservoir Road  
Washington, DC 20057-1484

or [cobbso@georgetown.edu](mailto:cobbso@georgetown.edu)

**This position has an immediate starting date.  
Applications will be reviewed until the position is filled.**



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