

Statistical Applications in Education

As statisticians, we recognize the need to develop students with strengths in mathematics and the other sciences. Now, as our educational process is under critical review, the need for technical excellence has never been higher. What role is statistical research playing to identify the need and suggest how this challenge can be met?

We are extremely fortunate to have Dr. Jon Miller as our January luncheon speaker to review some of the work he has been doing in the area of public education, focusing on technical literacy.

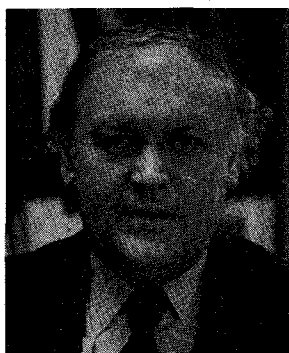
The luncheon will be held on Tuesday, January 8, 1991 at the Midland Hotel, 172 W. Adams at LaSalle in downtown Chicago. Registration will start at 11:45 a.m. and lunch will be served, starting at noon.

As Director of the Public Opinion Laboratory at Northern Illinois University, Dr. Miller directs research focused on the development of political and social attitudes in young adults and political behavior in modern democratic systems. He has worked extensively in defining and measuring scientific literacy and currently directs a major longitudinal study of the development of interest and competence in science and mathematics among middle and high school students.

Dr. Miller has served in the U.S. Bureau of the Budget and on the National Advisory Commission on Health Manpower, and was Director of Research for the American Hospital Association. In addition to directing the Public Opinion Laboratory, he is Professor of Political Science at Northern Illinois. His education has a Chicago flavor, having earned his M.A. at the University of Chicago and his Ph.D. from Northwestern.

Dr. Miller is the author of *Citizenship in an Age of Science* and *The American People and Science Policy*, as well as over 40 articles and papers. He is an active member of professional organizations in the opinion research and public policy fields.

To make reservations, call Sheila Proietti, (312) 727-4373, or Kenneth Wollenberg, (312) 727-7575, by noon, Friday, January 4, 1991. The cost is \$20 for members and \$22 for non-members. If you make



reservations and then are unable to attend, please let Kenneth know, since the Chapter must pay for luncheons prepared for no-shows.

As usual, the Chapter's Lucile Derrick Fund will purchase a limited number of luncheon tickets for students who wish to attend.

Peter McCullagh to Receive Statistician of the Year Award

Dr. Peter McCullagh of the University of Chicago has been offered and has accepted the Chicago Chapter ASA 1991 Statistician of the Year Award. Dr. McCullagh was chosen for his sustained contributions to the field of statistics. This 24th presentation of the award will be made at the May luncheon, when Dr. McCullagh will be the featured speaker.

Membership Could Top 1,000

The 1991 membership campaign for the Chicago Chapter ASA began with a mailing to all Chicago area members of the ASA at the national level. The 895 members were mailed an invitation and application for membership in the Chicago Chapter and encouraged to invite associates to join. Membership reached a record level in 1989 with the new members attracted by Statfair. With a strong response, our current membership of almost 700 could reach 1,000.

Enclosed with this month's *Parameter* is a membership information form, and it has something new — a survey on the back side. This is not a long survey, but it has been designed to collect enhanced information for the 1991 Membership Directory and to help the Chapter identify and serve the diverse interests of its members. You may wish to use this form as an invitation that you can copy and give to an associate who may benefit from the Chicago Chapter. You can help to make the Chicago Chapter grow.

Annual membership dues for **calendar year 1991** are now payable. To renew your membership and continue to receive *Parameter* and other benefits, please complete the membership form and mail with a check drawn to Chicago Chapter ASA in the envelope provided. Dues are \$10 (\$5 for students).

Even if you have paid your dues through the national
(Continued on Page 2)

Long-Range Planning

For the past several months, I've been wondering what a President-Elect can do to make himself useful. Finally, the answer came to me: long-range planning. What will we be doing next year when I'm on watch? It would be very helpful to hear from you, the members, on this question: In which direction should the Chapter be going, and what events should we be starting to plan? Please contact me with ideas, suggestions and offers to help at: Ernst & Young, 150 S. Wacker Dr., Chicago, IL 60606; 312/606-2143; FAX 312/606-2321.

To get the process started, I'll put forward some ideas that have come up recently.

Census Fair

The time will be ripe for an event that combines formal presentations on Census issues and results with exhibits of Census-related products and services for marketing and other purposes.

Baldrige Conference

This would be a how-to type of event addressed to personnel of companies interested in applying for the Baldrige Award or in the associated quality management discipline. Presenters would include accredited Baldrige Examiners, representatives of companies that have won the award, and experts on the statistical and managerial tools needed to achieve the award.

Membership Survey

An extensive fact and opinion survey of Chapter membership was last done *circa* 1985. It will make sense to conduct a new one in the coming year. In addition to the subjects covered last time, this survey should attempt to characterize Chapter membership as a target market for professional tools.

Marketing Service

In line with the above, and taking a cue from Linda Clark's Statfair, we may be able to make use of the Chapter's market presence and buying power to obtain standing discounts on computing hardware, statistical and other software, and statistics books and publications. This is at least worth looking into. Also, the idea of a Book Fair along the line of Statfair came up at the last board meeting. This might be integrated into Statfair, which may be due for a repetition in the coming year.

Bulletin Board

The idea of an electronic bulletin board service for members also came up at the last board meeting. There has even been a volunteer. The matter is being pursued.

Career Forum

Plans to make this an annual event are in abeyance while we try to improve our marketing to ensure better attendance. However, the usual biennial repetition is due in autumn of 1991. We will probably move it forward to October in hope of more reliable weather.

Thanks for your attention, and please get in touch.

*Phil Heckman
President-Elect*

Did You Ever Wonder . . .

As x Gets Bigger, y Gets Bigger, Or Does It?

Students who take a course entitled Regression Analysis are typically presented with the model $y = a + bx + u$ where x is a nonrandom quantity measured without error and u is a $N(0, s^2)$ distributed "error" term. (My idiosyncrasy is to "underscore" random variables.) In this model, when b is positive, then the larger x is, the larger (on average) is y .

When the student gets older, studies the history of statistics, or meets up with someone who took a course in statistics for psychologists, he or she hears something that doesn't quite reconcile with this notion of y getting bigger as x gets bigger. The student hears about the phenomenon of "regression to the mean." As Galton (1877, p. 513) put it (here he used the term "reversion" and subsequently adopted the term "regression"), "(r)everision is the tendency of that ideal mean type to depart from the parent type, 'reverting' towards what may be roughly and perhaps fairly described as the average ancestral type."

How do we reconcile these two notions? The psych statistics model is quite different from that given above, and has to be explicated carefully. We start with a bivariate normally distributed pair (x, y) and we note that the conditional mean of y given that x takes the value x is $E(y|x = x) = a + bx$. Now if one wants to do so, one can write this as $y = a + bx + u$, where $E u = 0$, making this model look like the previous model.

The "regression to the mean" phenomenon occurs in this model in the following situation. When $E y = E x$ and $V y = V x$ (as may be the case when x and y are the heights of fathers and sons, respectively) and if b is greater than 0, then it can be shown (see, for example, Schmittlein [1989]) that b is less than 1 and that $E(y|x = x) = (1 - b)E x + b x$, i.e., that on average, y reverts to the common mean of x and y .

To add to the confusion, this model is called the *regression* model. The model I described, taken from my mythical regression analysis course, is the *linear functional relation* model. To confuse matters, there is a third model, the *linear structural relation* model, in which $y = a + bx + u$, where x is a random variable (typically assumed to be independent of u). This model arises when (x, y^*) have a degenerate bivariate distribution on the line $y^* = a + bx$ and we observe $y = y^* + u$, i.e., we observe y^* with error. Finally, in all these cases the estimators of a and b are identical. The difference between the three are in the models themselves.

Al Madansky

Galton, F. 1877. Typical Laws of Heredity *Nature* 15 512-14.

Schmittlein, D. C. 1989. Surprising Inferences from Unsurprising Observations: Do Conditional Expectations Really Regress to the Mean? *American Statistician* 43 (August) 176-83.

Membership

(Continued from Page 1)

ASA, you should return the membership information form with complete information for the Chicago Chapter 1991 Membership Directory.

For additional membership information forms, contact the Vice-President of Membership: Merl Kardatzke, AIM — Suite 203, 907 N. Elm, Hinsdale, IL 60521.

Chicago ASA Help Line

The following Chicago Chapter ASA members have volunteered to answer your statistical software-related questions. Volunteers should be expected to answer only questions relating to *statistical software* and not questions relating to statistical procedures and their use in data analysis.

Don't be shy about using this valuable resource; it's one of the best services that the Chicago ASA provides to the Chicago statistical community. But, please use this service wisely. Treat these volunteers as you would like to be treated yourself. Before you call them, try to isolate your problem as best you can and check your documentation. (Don't expect any help if your software is an illegal copy and you have no documentation!) Remember, also, that some of the software vendors have their own help lines, so they should be availed of before calling on our volunteers. Try not to take up more than a few minutes of a volunteer's time. Don't expect answers which require a lot of time to provide, or specific answers to matters involving complex issues.

The Help Line is not intended to provide volunteers to give advice on issues that would otherwise entail the engagement of a paid consultant. You should be aware, though, that some of these volunteers are consultants in their area of expertise and that their voluntary help may evolve into a consulting engagement.

That this is a Chicago ASA service in no way implies that the Chapter warrants the service offered. Chicago ASA has not checked the volunteers to see if they really do know their stuff, so you're on your own with any advice received.

Help Line Volunteers:

1. Statistical Packages

BMDP

Minu Patel

M-F	4:00 p.m. — 5:00 p.m.	312-996-7600
	(will return calls)	

DataDesk 3.0

Eric Ziemer

M-F	9:00 a.m. — 4:30 p.m.	312-727-3951
M-F	6:30 p.m. — 10:00 p.m.	312-728-0258

Minitab

Don Porter

TuTh	5:30 p.m. — 7:00 p.m.	708-980-9318
		708-980-6682

NCSS (most options)

Jerry Enenstein

M-Sa	9:00 a.m. — 10:00 p.m.	708-475-4403
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RS/Explore & RS/Discover

Don Porter

TuTh	5:30 p.m. — 7:00 p.m.	708-980-9318
		708-980-6682

SAS

Gerry Keith

M-F	8:00 a.m. — 5:00 p.m.	312-727-2506
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Pete McGuire

M-F	3:00 p.m. — 4:00 p.m.	708-291-5232
MWTh	6:00 p.m. — 7:00 p.m.	708-392-5496

Don Porter

TuTh	5:30 p.m. — 7:00 p.m.	708-980-9318
		708-980-6682

SPSS

Jerry Enenstein

M-Sa	9:00 a.m. — 10:00 p.m.	708-475-4403
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Jim Kennedy

MWF	9:00 a.m. — 5:00 p.m.	708-441-9474
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STATGRAPHICS

Don Porter

TuTh	5:30 p.m. — 7:00 p.m.	708-980-9318
		708-980-6682

STATISTIX

Jerry Enenstein

M-Sa	9:00 a.m. — 10:00 p.m.	708-475-4403
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2. Statistical Application Areas

No volunteers

3. Statistically Oriented Programming Languages

C-programming

Lazar Primack

M-F	9:00 a.m. — 5:00 p.m.	312-822-6387
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LAHEY FORTRAN

Jerry Enenstein

M-Sa	9:00 a.m. — 10:00 p.m.	708-475-4403
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4. Hardware/Operating Systems/Peripherals

as they affect the use of statistical packages

Macintosh Computer Systems

Eric Ziemer

M-F	9:00 a.m. — 4:30 p.m.	312-727-3951
M-F	6:30 p.m. — 10:00 p.m.	312-728-0258

Ed Hirschland

M-F	8:00 a.m. — 6:00 p.m.	312-201-1111
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If you are interested in volunteering to answer questions in any Help Line category, write or call Help Line Editor Linda Clark at LMC Consulting Co., 1127 Dartmouth Rd., Flossmoor, IL 60422-1639; 708-798-0677.

Science Fair Judges Needed

At least 20 volunteer judges are needed for the Chicago Board of Education Science Fair for high school students. The fair will be held on the morning of February 14, 1991. If interested, please call Merl Kardatzke by January 7, 1991 at work — (708) 654-0240 — or at home — (312) 779-8508.

Advertising for 1991 Membership Directory

The directory for the Chicago Chapter, ASA, is planned for publication in early 1991. Those individuals and organizations wishing to advertise should contact:

V. Pres. Membership, ASA
c/o AIM, Suite 203
907 N. Elm
Hinsdale, IL 60521

or call Merl Kardatzke at

office: (708) 654-0240
home: (312) 779-8508.

The deadline for camera-ready copy is Jan. 31, 1991.

Editor: Kathy Morrissey (708) 564-6380

Parameter, the official newsletter of the Chicago Chapter of the American Statistical Association, is published 11 times per year as a service for its members. Materials for publication should be submitted to the editor at Household Bank — 2N, 2700 Sanders Rd., Prospect Heights, IL 60070. **Deadline for the February *Parameter* is Jan. 21.**

Parameter offers a free placement service for ASA Chicago Chapter members. Job applicants should send a draft of their advertisement and a resume to the editor at the above address. Applicant names will remain confidential if requested.

Advertising in *Parameter*

The *Parameter* will publish employment ads free of charge for members. An ad can be from an employer seeking to fill a position, provided it is submitted by a member, or an ad can be placed seeking employment, provided it is on the behalf of a member.

Other ads seeking to sell products or services may be placed in *Parameter* at a charge. Contact the editor, Kathy Morrissey, at (708) 564-6380 for more information.

Looking for a Position

Dedicated, quick-learning, quality-focused individual is seeking a career in the mathematical/statistical field that utilizes her problem-solving and analytical abilities. In addition to a Bachelor of Science Degree in Mathematics and an Economics Minor, she possesses excellent organizational skills, applied computer knowledge and a strong background in statistics. Call Deb Wynne at (313) 669-6873 or after January 8th (312) 352-7405.

Position to be Filled

Immediate full-time opening in statistical software support. Successful candidate will be part of a close-knit Sales and Marketing Group for Data Desk data analysis software, and will be responsible for all post-sales support and some pre-sales consulting (and sales). This is an opportunity to be involved in a new sales, marketing and development effort for an established, successful software product. Employee will interact and learn from one of the pioneers in the field of exploratory data analysis. *A broad range of statistical knowledge is essential.*

Send resume to: David Davoust, Odesta Corporation, 4084 Commercial Ave., Northbrook, IL 60062; (708) 498-6515.