NEWSLETTER OF THE INTERNATIONAL STUDY GROUP
FOR RESEARCH ON LEARNING PROBABILITY AND STATISTICS

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Membership

After the request in the September newsletter to let me know if you want to continue in the study group, I received a flurry of messages and renewals. Thank you all, for your gracious comments and for other information you sent, most of which appears in this issue. The list of members has now shrunk quite a bit, as many people did not respond as of this date, and I am removing them from the mailing list. Our current roster of continuing members is:

Andrew Ahlgren - USA
Meral Aksu - Turkey
Carmen Batanero - Spain
Rolf Biehler - Germany
Carol Joyce Blumberg - USA
Van Bowen -USA
Marcelo Borba - USA
Manfred Borovcnik - Austria
George Bright - USA
P.H. Cheung - Hong Kong
Jim Cotts -USA
Robert delMas - USA
Ruma Falk - Israel
Lynn Friedman -USA
Dargan Frierson -USA
Iddo Gal - USA
Joan Garfield -USA
Brian Greer - Ireland
Anne Hawkins - England
Ted Hodgson - USA
Peter Holmes - England
Flavia Jolliffe - England
Alan Kimber - England
Won Kyung Kim -Korea
John Kinney - USA
James Lang - USA
Marie-Paule Lecoutre - France
Hea Jin Lee - Korea
Hee Chan Lew - Korea
Andrzej Matuszewski -Poland
Dean Nelson - USA
Vee Ming Ng -Australia
Lane Peeler - USA
Gilberte Schuyten - Belgium
Heinz Steinbring - Germany
Ann Watkins - USA
Jane Watson - Australia
Arnie Well - USA
Judith Zawojewski - USA

We also have four new members:

John Behrens - USA
Giuseppe Cicchitelli - Italy
Patricia Elmore - USA
Susan Starkings - England

Because there is so much material in this newsletter, I will include a complete roster of names, addresses and e-mail addresses in the next newsletter.

Publications and Presentations of Members

Flavia Jolliffe sent a copy of her paper given at the ISI Round Table last summer, "The preliminary stages of data analysis at school level." This paper presents the view that wherever and whenever data analysis appears in the curriculum, the aim is that students will learn something about data analysis as a skill in its own right, as well as about its use as a tool of investigation in an application area. This paper discusses what kinds of data are suitable and how to obtain them, how to start studying a data set, and what might be done in an initial analysis. For a copy of this paper, contact Flavia at: f.r.jolliffe@greenwich.ac.uk

Susan Starkings also sent a paper from the ISI Round Table: "Data Analysis: Who should teach it?" The aim of

The Newsletter

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this paper is to draw attention to the main areas where data analysis is currently being taught, namely: (i) mathematics containing a data analysis element; (ii) specific courses in statistics; (iii) data analysis taught specifically in other subject areas and (iv) courses which make an inherent assumption of statistical knowledge. The paper attempts to elucidate the teaching of data analysis in these areas and to promote discussion for using appropriate methods of teaching data analysis within different educational settings.

Marie Paule Lecoutre sent an abstract of a paper to be published in *Organization Behavior and Human Decision Processes*, "Predictive Judgments in Situations of Statistical Analysis."

Abstract:
Probabilistic judgments made by researchers in psychology were investigated in statistical prediction situations. From these situations it is possible to test the representativeness hypothesis and the significance hypothesis. The predictive judgments concerned both an elementary descriptive statistic and a significant test statistic. In the first case, the predictive judgments were generally coherent, and fit comparatively well to Bayesian standard predictive probabilities. In the second case, they were generally incoherent, and fit poorly to Bayesian standard predictive probabilities. As for the two hypotheses tested, our findings are compatible with the significance hypothesis, but go against the representativeness hypothesis.

For a copy of this paper, contact Marie at
Groupe Mathematiques et Psychologie
University Rene Descartes
Sorbonne
12 Rue Cujas
75005
Paris, France

Andrzej Matuszewski has written an article which tries to define a border line between spreadsheets and statistical packages. He describe the paper as follows: Certain possibilities of spreadsheets for time-series analysis seem to not be appreciated by the scientific community. The border line seems to have also a significance for education in statistics especially at the beginning period, and/or while teaching data analysis.

Unfortunately, there exists only a Polish-language version of the paper. However, if members are interested in this topic it would motivate him to prepare an English version as well. Let him know if you are interested, e-mail: amat@plearn.bitnet.

Brian Greer sent a draft copy of *Handling Information*, a unit within Oxford Mathematics, a curriculum for students aged 11-16. It is one of 12 such units for the first age group, and corresponds to about 3 weeks of work. Publication is planned for 1994. This is a very creative and appealing approach to lead students to examine how numbers are used in different ways in real life, how we make decisions using numbers, and how we read and interpret information from tables and graphs. If anyone is interested in reviewing this unit, contact Brian at pyg0051@v2.qub.ac.uk.

More on Data Visualization

Brian Greer's unit on Handling Information has some features in common with the *Data Visualization* book mentioned in the last newsletter. Joan Garfield has written a review of this material for a forthcoming issue of *Statistics Teacher Network*. If anyone would like a copy, let her know. A related article appeared in the October 1992 issue of *Mathematics Teacher*: "The Standards Applied: Teaching Data Visualization." This article describes the testing of the unit in a Wisconsin high school. It describes the use of cooperative groups and some assessment results.

A Resource for Teachers of Statistics

A new book by **Anne Hawkins, Flavia Jolliffe,** and the late Leslie Glickman is now available, titled *Teaching Statistical Concepts*. This book may serve as a resource for teachers of statistics at all levels. It includes considerations of:

- changes taking place in the field of statistics
- conceptual difficulties which face teachers and students of probability and statistics
- research into statistical education
- management of statistical project work
- developments in teaching methods and materials
- use and evaluation of teaching resources
- assessment of statistical skills and understanding

The flyer says "your bookshop can supply this book from stock or can order it for you. In case of difficulty, please contact Charlotte Dwyer at Longman Higher Education, Longman House, Burnt Mill, Harlow, Essex CM20 2JE, UK." ISMB 0 582 06820 7

ICME 1992

Flavia Jolliffe sent a copy of her minutes from ICME Working Group 12: Probability and Statistics for the Future Citizen. This group was chaired by Mary Rouncefield (UK) and James Schultz (USA) and involved many members, past and present, of this study group. Here is a brief summary of her minutes:

The first session was on the role of technology in teaching probability and statistics. David Moore (US) talked about what videos can and cannot do to help students learn. Peter Homes and Mike Hammond (UK) described a development project on using databases and spreadsheets in teaching data-handling to pupils aged 11-16. Brian Hudson (UK) talked about a curriculum development project which included a cross-curricular package focused on economic awareness and environmental education. The session concluded with a general discussion on the use of computers in statistics education.

The second session was on cross-curricular issues and applications of statistics. Annie Morin (France) talked about statistics and probability for today's French citizen and how French schools are teaching data analysis. Rheta Rubinstein (Canada) talked about the University of Chicago School Mathematics Project where statistics is integrated into a one-year course on functions for students 16-17 years old.

Megan Clark (New Zealand) talked about how the context in which problems are set affects students' performance, and presented data on group differences (according to gender or student major) on problems using different contexts. Glyn Davies (UK) talked about the project on data handling in the National Curriculum in the UK.

In the third session, presentations were concerned with the teaching of probability and statistics in developing countries. Andi Nasoetion (Indonesia) spoke abut statistics at school level in Indonesia.
Aziz Lazraq (Morocco) talked about opening up opportunities in probability and statistics for students in Morocco. Parul Deoki (Fiji) described some of the problems in teaching probability at the University of the South Pacific, a regional university serving 12 developing island nations which have different educational systems, different languages, and different cultures. Saleha Habibullah (Pakistan) talked about statistics education in her country.

The last session of the working group was on current and future trends and strategies in the teaching of probability and statistics. Jan de Lange (Holland) talked abou developing a critical attitude in the teaching of statistics. Gail Burrill (USA) talked about her experiences with the Quantitative Literacy Project and the new data-driven curriculum project. Peter Wilder (UK) described his work with students on some well-known counter-intuitive problems in probability where it was necessary to identify clearly both the conditioning event and the target event. Manfred Borovcnik (Austria) talked about intuitive strategies for teaching probability and statistics, and discussed why teaching these topics is difficult.

Other Publications of Interest

A paper by David Moore to appear in the*American Statistician*. is "The Place of Video in New Styles of Teaching and Learning Statistics." This paper explores how teachers can make effective use of video, and suggests how video can best be used in new, multimedia instructional systems. The paper also reviews research on learning through television in order to make practical suggestions. Copies may be obtained by writing David a Dept of Statistics, Purdue University, West Lafayette, IN 47907-1399.

Two forthcoming articles by Jacquelin Dietz are described below:

"What I did during summer vacation: Statistics Camp!" will appear in *Proceedings of the Statistical Education Section of ASA* (1992).
This article describes a two-week academic camp in matl and statistics for highly motivated high school students. The camp was hosted by the college of Physical and Mathematical Sciences at North Carolina State University. There is a description of daily activities, use of videos, guest speakers, and computers.

"A Cooperative Learning Activity on Methods of Selecting a Sample" will appear in the *American Statistician*. This paper describes a classroom activity designed to stimulate students to think creatively about methods of selecting a representative sample from a population. Students work in small groups to generate different methods for selecting representative samples from a large data set. Students are then asked to evaluate advantages and disadvantages of the different sampling methods.

"Preparing High School Mathematics teachers to teach statistics" by Robert Hayden and Farid Kianifard appeared in the *American Statistician* (November 1992). This paper describes the joint effort of a statistician and a mathematics educator to offer current high school teach-

ers a one-semester course. The course was designed to give teachers a background knowledge of statistics to help them implement recommendations from the NSTM standards.

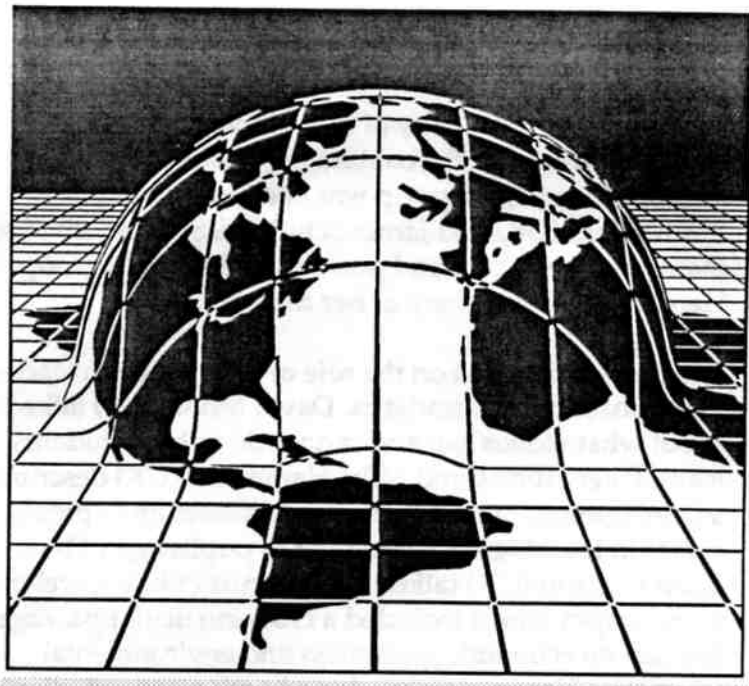
An article about the "Chance Course" is in the latest issue of *Chance Magazine* (Vol 5, 1992). This is an innovative course developed at Dartmouth College and currently offered at a few other liberal arts colleges. The aim of the course is to study important current news items (in newspapers, journals, and magazines) whose understanding requires a knowledge of chance concepts. It is not designed to replace an introductory course but rather aims to encourage students to think more rationally about chance events and to make them more informed readers of the daily press. A variety of alternative assessment procedures are being used to evaluate the impact of this course on student learning of statistics and probability.

A Rationale for Teaching Probability and Statistics in Primary and Secondary Schools (1990) is a report from the Rutgers University Center for Mathematics, Science, and Computer Education. This document explores reasons why statistics and probability are appropriate topics for primary and secondary schools, with recommendations for topics appropriate for different grade levels, and comments about teaching methods. Copies may be obtained from the Center for Mathematics, Science and Computer Education, Science and Engineering Resource Center Building, Room 239, Busch Campus, Piscataway, NJ 08855-1179.

A detailed and critical review by Mike Shaughnessy of the book, *Chance Encounters: Probability in Education* , appears in the January 1993 issue of Journal for Research in Mathematics Education.

New Educational Software

James Lang gave a presentation at the January MAA meeting on StatBox, a program written in Hyper Card to help students visualize sampling distributions, confidence intervals, and hypothesis tests. A unique feature of this program is that the applications start at a very low level of abstraction and allow the student to move up when ready. For a copy of the program and documentation, send a blank 3.5 diskette to: James Lang at Valencia Community College, 701 N. Econ Trail, Orlando, FL 32825.



New Educational Video Series

A new version of the Against all Odds video series, shortened and adapted for High School students, is available from COMAP. This five-hour series is called: Statistics: Decisions through Data. For more information, contact: COMAP Suite 210, 57 Bedford St. , Lexington, MA 02173. If you haven't seen the original series, you should. They are really terrific.

Assessment

In November, a workshop was held at the University of Pennsylvania, "Assessment Issues in Statistical Education." Organized by Iddo Gal and Joan Garfield, the workshop brought together a dozen participants representing different levels of statistics or mathematics education, educational assessment, science education, and teacher training programs. Two days of spirited discussions revealed important issues related to assessing statistical learning. The group also identified future work that needs to be done in this area. A position paper is being written based on discussions at the workshop, and plans for a second conference are in the works. Anyone with a strong interest in this area, who would like to be included in the conference, should contact Iddo (gal@a1.relay.upenn.edu) or Joan (jbg@vx.cis.umn.edu).

IASE Meeting

There is a call for papers, posters or exhibits for the first meeting of the International Association of Statistical Education, to be held in Perugia, Italy in August, 1993. For information, contact: G. Cicchitelli at e-mail: statli@ipguniv.bitnet, or FAX: 39-75-43242.