NEWSLETTER FOR THE INTERNATIONAL STUDY GROUP ON
LEARNING PROBABILITY AND STATISTICS CONCEPTS

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Notes and Comments

Happy New Year to all of you! I propose starting off the new year with a new name. Several people have suggested changing or abbreviating the name of this study group, resulting in a name whose initials spell an easy-to-remember acronym. Do you have suggestions? How about Research on Learning Stochastics (ROLS), International Study Group on Learning Stochastics (ISGLS), or Learning Probability and Statistics (LPS). Please comment or suggest alternatives.

Once again, our membership has expanded. Our new members are from four different countries. Manfred Borovcnik from Austria, Michael Glencross from South Africa, Andee Rubin, Bertram Bruce, and Anne Rosebery from the USA; and Romano Scozzafava from Italy. I have included our new members in the attached updated l of all members.

My bibliography of research articles is expanding, but my collection of measurement instruments is small. There seems to be a real need for good instruments to assess understanding of probability and statistics concepts that can be used both for teaching and research. Please send me copies of any instruments you've developed and/or used with students of any level.

Papers from ISI and ICME

The following members sent copies to me of papers they presented this past summer.

"Changing Conceptions of Statistics: A Problem Area for Teacher Education," by Rolf Biehler. This paper discusses the changing conceptions of statistics, meta-knowledge (knowledge about statistics) as part of teachers' professional knowledge, and a project called GRAPHDAS which is being used to help teachers understand Exploratory Data Analysis (EDA). Rolf also has compiled a bibliography on teaching EDA at the school level.

"Problem Areas Related to Statistics in Training Teachers of Mathematics in Turkey," by Meral Aksu. This paper describes the Turkish school system, the place of statistics in the secondary mathematics curriculum and problems related to training mathematics teachers to teach statistics.

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"An Experience of Co-operation Between Researchers and In-Service Teachers: Elaboration of Didactic Materials," by Maria Reggiani. This paper discusses problems of utilizing research results in pre-service and in-service teacher training. The work of a research group in mathematical didactics is described as it relates to the development of materials for teaching probability.

"Teacher Training by Teacher Collaboration in a Curriculum Project," by Hans Schupp. This paper discusses curriculum development and in-service teacher training. It discusses a research team made up of a planning group and a performing group, and the effect on teachers of seeing how motivated students were to learn about stochastical phenomena.

"The Practice of Teaching and Research in Didactics," by Andre Rouchier and Heinz Steinbring. This thoughtful and theoretical paper explores the relationship between educational research and the practice of mathematics teaching.

"Proposal of Curriculum for Teaching Probability and Statistics," by Angela Pesci. This paper describes the development and evaluation of materials for teaching elements of probability and statistics for students aged 11-14.

"Computer Simulation of Probability Challenges: From Data to Theory," by J. Michael Shaughnessy. This paper addresses the use of microcomputers in mathematics classes to enhance data collection and data analysis for stochastic experiences. A model for teaching stochastics concepts is presented which can be applied to students in lower secondary levels, secondary school, or pre-service or in-service teachers.

Thanks to all of you who sent papers. I enjoyed reading them and added them to my growing reference library. I'm sure these authors would be happy to send copies if you would like to read a particular paper.

Other Papers of Interest

I obtained a copy of the Proceedings of the Second Conference on the Teaching of Statistics, held in New York in April 1987. Although the papers are primarily geared to the training of statisticians, or to teaching statistics at the university level, notes on three roundtable discussions are of interest. They are:

1. Evaluating Microcomputer Statistics Packages
2. Objectives of an Introductory Statistics Course
3. Statistics in Curriculum in the High Schools

A new book has just come out called Innumeracy: Mathematical Illiteracy and Its Consequences, by John Allen Paulos. In an article in the New York Times book review (January 1, 1989) he describes his ideas about innumercy, including a discussion of understandings (and misunderstandings) related to probability. Two weeks later (January 15, 1988) a review of the book appeared, titled "How to win a Coin Toss." I am trying to obtain a copy of the book.

I have not come across any interesting articles to report. Please let me know if you have, and send me information on your current work. From the responses I've received from members (and I really appreciate the feedback) you like being updated on what is being done, who is doing what, and so on.

Requests

Michael Shaugnessy is writing a review of research related to teaching and learning probability and statistics for a forthcoming handbook on research in mathematics education. He would greatly appreciate copies of any recent papers you have written so that his chapter will be as current and complete as possible. (You might ask him, in exchange, for a copy of his chapter after it is published.)

I received a call for papers for the Third European Conference for Research on Learning and Instruction to be held in Madrid, Spain on September 4-7, 1989. If anyone attends this conference, please let me know of any papers delivered related to the learning of probability and statistics. Thanks.

ICOTS 3

The Third International Conference on Teaching Statistics (ICOTS) is well into the planning stages. It will be held in Dunedin, New Zealand in August, 1990. I have been in contact with the local organizing committee to schedule a formal meeting of members of this study group who attend ICOTS 3. It was at ICOTS 2 that I met several of you, and I look forward to seeing some familiar faces again and matching up names and new faces in New Zealand.

Good News

Congratulations to Robert delMas, who recently completed his Ph.D. in educational psychology. The title of his dissertation is "The Effect of Activity-Based Instruction and Directed Evaluation of Predictions on Misconceptions of Probability." The subjects of his study were students in an introductory college statistics course.

Current Members of the
International Study Group on Learning
Probability and Statistics Concepts
(No. of members = 44, No. of countries = 14)

Name and Address	Research Interests
Professor Dr. A. H. Abele Schlittweg 33 D 6905 Schriesheim FRG	Probability and statistics at school level
Professor Andrew Ahlgren AAAS Education Section 1333 H Street N.W. Washington D.C. 20005 U.S.A.	Curriculum issues, misconceptions, evaluation of statistical education
Dr. Meral Aksu Faculty of Education Middle East Technical Univ. 06531 ANKARA TURKEY	Curriculum development and evaluation, mathematics education, teacher training, factors affecting achievement in statistics and mathematics
Linda Alvord Scotch Plains- Fanwood HS Scotch Plains, NJ 08826 U.S.A.	Probability and statistics in APL
Dr. Rolf Biehler Institut fur Didatik dur Mathematik Universitat Bielefeld Postfach 8640 4800 BIELEFELD 1 WEST GERMANY	Use of computers in teaching and learning probability and statistics, epistemological and historical aspects of probability and statistics, their relevance in teacher education and curriculum design, exploratory data analysis
Dr. Manfred Borovcnik A-9020 Universitat Klagenfurt Institut f. Mathematik Universitatsstrabe 65-67 Austria	Philosophical background (subjectivist-objectivist controversy) "Relations" between mathematics and intuitions. Empirical research on cognitive development of intuitive conceptions.
Bertram Bruce BBN Systems and Tech. Corp. 10 Moulton Street Cambridge, MA 02238 USA	
Mr. P.H. Cheung General Post Office Box 10911 Hong Kong	Teaching and learning of statistics and probability

J. Clayson 10 Square Alboni 75016 PARIS FRANCE	Exploratory data analysis, graphical techniques, pattern recognition, teaching visual thinking
Ms. Ann Dalzell 121, Newlands Road Kings Heath Birmingham B30 2RL ENGLAND	Interests relate to 11-18 age group. Interest in gender issues. Not involved in research at present.
Robert delMas 106 Nicholson Hall 216 Pillsbury Drive SE University of Minnesota Minneapolis, MN 55455 U.S.A.	Psychological issues in learning probability, development of instructional software to confront students' misconception.
Dr. Ruma Falk Dept. of Psychology Hebrew University of Jerusalem Jerusalem 91905 ISRAEL	Judgement of chance and coincidences, children's concept of probability, the teaching of probability and statistics for undergraduate university students, revision of beliefs as a function of combinations of uncertain testimonies.
Professor E. Fischbein School of Education Tel-Aviv University RAMAT AVIV 69978 P.O.B. 39040 TEL-AVIV ISRAEL	Cognitive psychology, probability, combinatories, arithmetical operation
Ms. Margaret Gallimore Dept. of Applied Statistics Sheffield City Polytechnic Pond Street Sheffield S1 1WB England U.K.	Statistical education
Joan Garfield 106 Nicholson 216 Pillsbury Drive SE Minneapolis, MN 55455 U.S.A.	Confronting and overcoming students' misconceptions regarding probability and statistics concepts, evaluating pre-college probability, and statistics curriculum projects
Dr. Michael J. Glencross Dept. of Statistics Univ. of the Witwatersand PO WITS Johannesburg South Africa 2050	Item response theory; curriculum development in mathematics and statistics education.

MEMBER2

Mr. L.V. Glickman Computing, Math & Applied Subjects City of London Polytechnic 100 Minories, LONDON EC3N 1JY U.K.	Paradoxes in probability and statistics, role of history of probability in teaching probability
Dr. Elisabeth M. Goodwin Dept. of Education and Science 60 Rochester Row London SW1P 1YP UNITED KINGDOM	My job requires me to visit polytechnics and colleges looking at the teaching of probability and statistics.
Enno L.E. Gowers Hauptstr. 219 5000 Koeln 90 WEST GERMANY	Probability and Statistics in secondary education.
Dr. David R. Green Centre for Advancement of Math Ed. in Technology University of Technology LOUGHBOROUGH Leicestershire LE11 3TU U.K.	Students' ideas of randomness
Mrs. Anne Hawkins Centre for Statistical Ed. University of London Institute of Education 20 Bedford Way LONDON WC 1H OAL U.K.	Statistical education, probabilistic concepts and skills
Mrs. Judith Jackson Ridre Barn Widdop Hibden Bridge W. Yorks HX7 7AT ENGLAND	
Mr. Ed Jacobsen ED/STE UNESCO Place De Fontenoy Paris 75700 FRANCE	Study of goals in math education; education of learning math; teacher education (math); international statistics education.
Mrs. Flavia R. Jolliffe Department of Mathematics & Statistics Brunel University Uxbridge UB8 3PH England	Statistical education including: a study of university students' intuitions re probability, research on measuring student understanding of statistics, teaching statistics at school level, sample survey design and analysis

MEMBER3

Dr. Ramesh Kapadia D.E.S. Turret House Epson Road Guildford GU1 3PH U.K.	Probability education
Dr. Alan C. Kimber Dept. of Mathematics University of Surrey Guildford Surrey GU2 5XH ENGLAND	Reliability, outliers, applications of statistics in biology/medicine/engineering. Intuition re outliers normality, variabilit etc; "simple" and "interesting" stochastic processes
Laura Koch General College-SBM 106 Nicholson Hall 216 Pillsbury Drive SE Minneapolis, MN 55455 U.S.A.	Rational numbers, proportional reasoning, probabilistic reasoning
Dr. Clifford Konold Hasbrouck Laboratory Univ. of Massachusetts Amherst, MA 01003 U.S.A.	Student conceptions of probability and statistics, effects of instruction on probability and statistics concepts, problem solving
Dr. Marie-Paule Lecoutre Groupe Math. et Psychologie Universite Rene Descartes SORBONNE 12 Rue Cujas 75005 PARIS FRANCE	Intuitive probabilistic judgements developed by students and by researchers in situations of statistical analysis
Dr. Andrzej Matuszewski Institute of Computer Science Polish Academy of Sciences PO Box 22 00-901 WARSAW PKiN PKIN POLAND	Statistics in artificial intelligence, Bayesian notions for teaching, fiducial argument
Professor Allan C. Malmberg Royal Danish Sch. of Ed. Studies 115 B Emdrupvej 2400 Copenhagen NV DENMARK	The teaching of probability and statistics (Grade 1-10); the use of informatics in mathematics education (Grade 1-10)
Professor Guy Noel Faculte des Sciences 15 Avenue Maistriau B 7000 MONS BELGIUM	Intuition aspects

MEMBER4

Professor Gottfried E. Noether 88 Hillyndale Road Storrs, CT 06268 USA	Use of nonparametrics in teaching statistics. Currently serves as chairman of ISI task force on Teaching Statistics at school level.
Mr. John Pancari St. Joseph High School 133 North Third Street Hammonton, NJ 08037 USA	Teaching statistics in secondary school.
Angela Pesci Dept. of Mathematics University of Pavia Strada Nuova 65 27100 Pavia Italy	Teaching probability and statistics for ages 11-16
Maria Reggiani Dept. of Mathematics University of Pavia Strada Nuova 65 27100 Pavia Italy	Mathematics teaching for ages 11-16, particularly probability, statistics, informatics
Ann Roseberg BBN Systems and Tech. Corp. 10 Moulton Street Cambridge, MA 02238 USA	
Ms. Mary Rouncefield 29 Clarkehouse Road Sheffield S110 2LA England	Statistical education and teaching methods
Andee Rubin Senior Scientist BBN Systems and Tech. Corp. 10 Moulton Street Cambridge, MA 02238 USA	Developing and using software related statistical visualization, statistical micro-worlds, and statistical planning.
Dr. Hans Schupp Fachbereich Mathematik Der Universitat des Saarlandes SAARBRUCKEN D-66 FRG	Statistics instruction in the middle grades
Prof. Romano Scozzafava Dipartimento Metodi E Modelli Mathematic Universita "La Sapienza" Via Scarpa 10 00161 ROMA ITALY	Subjective probability, Bayesian inference, conditional probability and paradoxes.

MEMBERS

Professor J.M. Shaughnessy Dept. of Mathematics Oregon State University Corvallis, Oregon 97330 U.S.A.	Research interests: misconceptions of probability, Van Hiele levels of geometric thought
Dr. Murray H. Siegel 315 Meadwood Drive Roswell, GA 30075 USA	Use of median-based techniques to develop more classical statistical concepts. Use of statistical topics and surveys to enhance teaching of math topics.
Dr. Heinz Steinbring Institut fur Didatik dur Mathematik Universitat Bielefeld Postfach 8640 4800 BIELEFELD 1 WEST GERMANY	Stochastics teaching in general education, analysis of the specific epistemology of school mathematics, classroom observation, empirical research on mathematics teaching, teacher-inservice