Papers presented at the Annual Meeting of the American Statistical Association, San Francisco, California, August 17-20, 1987, under the sponsorship of the Section on Statistical Education
# TABLE OF CONTENTS

## INVITED PAPERS BY TOPIC

### I. STATISTICAL COMPUTING: EDUCATION AND FUTURE

**Organizer/Chair:** SALLIE KELLER-MCNULTY, Kansas State University

- A View of Computational Statistics and Its Curriculum. EDWARD J. WEGMAN, George Mason University  
- Graduate Education in Computational Statistics. WILLIAM F. EDDY, Carnegie Mellon University; ALBYN C. JONES, Reed College; ROBERT E. KASS, MARK J. SCHERVISH, Carnegie Mellon University  

### II. QUALITY CONTROL PROGRAMS IN ACADEMIA AND INDUSTRY

**Organizer/Chair:** JAMES A. CALVIN, University of Iowa

- Quality Management and Productivity: An Interdisciplinary Master's Degree. ROBERT V. HOGG, University of Iowa  
- One Approach to Statistical Training in Quality. EDWARD G. SCHILLING, Rochester Institute of Technology  
- Achieving the Statistically Competent Organization. STEPHEN A. ZAYAC, Ford Motor Company

### III. MICROS AND SUPERMICROS IN UNDERGRADUATE STATISTICAL EDUCATION

**Organizer:** JOHN D. HOLT, University of Guelph  
**Chair:** J. RICHARD ELLIOTT, Wilfrid Laurier University

- Computer Simulations to Motivate and/or Confirm Theoretical Concepts. ELLIOT A. TANIS, Hope College  
- A Comprehensive Computer Assisted Instructional Package for Statistics. JOHN H. SCHUENEMEYER, MARY JAC REED, ARTHUR E. HOERL, VICTOR MARTUZA, University of Delaware  
- Discussion. KENNETH N. BERK, Illinois State University

### IV. PANEL DISCUSSION — APPLICATIONS OF RECENT METHODOLOGY IN IMPROVING THE QUALITY OF BUSINESS STATISTICS COURSES: A PROCESS APPROACH

**Organizer:** DOUGLAS A. ZAHN, Florida State University  
**Chair:** P. GEORGE BENSON, University of Minnesota

- Improving the Quality of Business Statistics: A Process Approach. DOUGLAS A. ZAHN, Florida State University; P. GEORGE BENSON, University of Minnesota; A. BLANTON GODFREY, The Juran Institute; ROBERT B. MILLER, University of Wisconsin; LAWRENCE A. SHERR, University of Kansas

### V. PANEL DISCUSSION—ARE HYPOTHESIS TESTS, P-VALUES, AND MULTIPLE COMPARISONS APPROPRIATE TOOLS IN APPLIED RESEARCH?

**Organizer/Chair:** STANLEY A. LEMESHOW, University of Massachusetts–Amherst

- Significance Tests Versus Continuity Principles in Scientific Applications of Statistics. SANDER GREENLAND, University of California–Los Angeles
CONTRIBUTED PAPERS BY TOPIC

I. ASPECTS OF COMPUTING IN STATISTICAL EDUCATION

Chair: MARTYN SMITH, Michigan Technical University

A Survey of the Current Status of Statistical Computing in the New England Colleges. DAVID P. KOPCSO, Babson College 58

Statistical Methodology and E.S. F. BROECKX, University of Antwerp, Belgium; J. SCHREURS, Limburg Business School, Belgium 62

Statistics Education and Personal Computers. MAHESH CHANDRA, IVO ANTONIAZZI, Hofstra University 68

Using Showmaker to Teach Statistics. THOMAS S. BROWN, JAMES T. BROWN, Southwest Missouri State University 72

A Multiple Linear Regression Model to Predict First Semester Grade Point Average. ERNEST J. MANFRED, MARK A. FISHER, U.S. Coast Guard Academy 76

II. TEACHING IDEAS FOR BASIC STATISTICS COURSES

Chair: RONALD L. WASSERSTEIN, Washburn University

Students' Reactions to the Use of MINITAB in an Introductory Statistics Course. W. ROBERT STEPHENSON, Iowa State University 81

Enhancing a Statistics Class: A Real Survey + SAS. ChERYL M. WALLGREN, Southeast Missouri State University 87

Guidelines for Case Studies. ANNABETH L. PROSPST, Process Management Institute, Inc. 89

Discussion Teams in an Elementary Statistics Course. HENRYKA KOMANsKA, Lafayette College 93

Data Presentation in Introductory Statistics: Texts and Courses. MIRIAM SCHAPIRO GROSOF, Stern College, Yeshiva University; HYMAN SARDY, City University of New York—Brooklyn College 96

Design and Content of Introductory Statistics Lecture Notes. GARY B. BEUS, Brigham Young University; SUSAN M. HARDY, University of California, Berkeley 99

III. TOPICS IN TEACHING IN THE HEALTH SCIENCES

Chair: JAMES R. SCHWENKE, Kansas State University

A Hierarchical Analysis of the Effects of an Activity-Centered Health Curriculum. CHARLES H. BROOKS, Cleveland State University 105

Simulation as an Aid to Understanding Statistical Concepts. GRENIETH J. ZIMMERMAN, GERALD W. SHAVLIK, Loma Linda University 110

Teaching Biostatistics with an Emphasis on Reading the Medical Literature. KENNETH B. SCHECHTMAN, EDWARD L. SPITZNAGEL, Washington University School of Medicine 111


IV. PRECOLLEGE STATISTICS: EXPERIENCES FROM THE CLASSROOM

Organizer/Chair: JAMES M. LANDWEHR, AT&T Bell Labs

Teaching Precollege Statistics. ARLENE F. JOHNSON, Staples High School, Westport, Connecticut 121

Probability and Statistics in Midwest High Schools. LINDA M. PENAS, University of North Dakota 122
High School Absenteeism: A Student Survey. DANI BRULAG, Las Plumas High School, Redding, California

Introducing Probability and Statistics into the English Studies Curriculum. EUNICE D. GOLDBERG, Northwestern University; JUDITH J. ZAWOJEWSKI, National College of Education; ROBERT BORUCH, Northwestern University

V. METHODOLOGY DEVELOPMENTS WHICH CAN BE PRESENTED IN THE CLASSROOM

Chair: DENNIS L. CLASON, New Mexico State University

Overcoming Software Weakness While Teaching Coding for Designed Experiments. WILLIAM H. COLLINS, CAROL B. COLLINS, East Carolina University

Using Box–Jenkins ARIMA Models to Unify the Teaching of Applied Forecasting Methodologies. BRUCE L. BOWERMAN, J. MARCUS JOBE, Miami University

A Note on Using a Hypothesis Dependent Variance Estimate. ARVIND K. SHAH, JOHN J. LEFANTE, JR., University of South Alabama

An Introduction and Example of Estimability in Linear Models. RICHARD E. AUER, Loyola College

Teaching Sample Survey Methodology. ANIS ASHRAF, MUKUND NARGUNDKAR, Statistics Canada

Triangle Generating Functions (TGF). DONALD T. SEARLS, University of Northern Colorado

Application of a Motivational Tool for the Instruction of Linear Programming Methods. J. MARCUS JOBE, Miami University

VI. TOPICS IN STATISTICAL EDUCATION

Chair: JAMES W. NEILL, Kansas State University

Sequentially Acceptive Multiple Test Procedure. HWA-MING YANG, Wichita State University

An Approximation to Values of Standard Normal Variable Having \( \alpha \) as Right-Tail Area. YEW-KY KIM, Western Illinois University; YOUNGRYONG PARK, Syracuse University; TEJ K. KAUL, Western Illinois University

The Overwhelming Factor Paradox. W.D. KAIGH, University of Texas at El Paso

Errors in the Quantification of Uncertainty: A Product of Heuristics or Minimal Probability Knowledge Base? R.J. GEBOTYS, S.P. CLAXTON-OLDFIELD, Wilfrid Laurier University

Quasi-Inferential Statistics. CHAMONT W. H. WANG, Trenton State College

Interpretation of Confidence Intervals and Tests of Hypotheses. S.K. KATTI, University of Missouri

VII. NEEDS AND IDEAS FOR STATISTICAL TRAINING PROGRAMS

Chair: MARK S. MCNULTY, Kansas State University

Is an Undergraduate Statistics Major a Good Idea? WILLIAM C. LOUV, Merrell Dow Research Institute; FRANK H. DIETRICH, II, Northern Kentucky University

Graduate Statistics Service Courses in a Non-Standard Environment. WILLIAM L. SEAVER, GABRIELLA M. BELL, VPI & State University

Technical Skills and Training Needs of Applied Demographers. LAURENCE S. ROSEN, Western Michigan University; DAVID A. SWANSON, Pacific Lutheran University; HALLIE J. KINTNER, General Motors Research Laboratories

A Four-Day Course in Statistics: Tips and Traps. RICHARD A. LEWIS, Union Carbide Corporation

Practitioner and Academician Co-Teaching: An Idea to Consider. GERALD J. HAHN, General Electric Company; JOSEF SCHMEE, Union College
Subjective Grouping to Increase Prediction Efficiency. RASHID A. AL-THABIA, Kuwait Institute for Scientific Research

CONTRIBUTED PAPERS—POSTER SESSIONS

Teaching Packaged Statistical Programs and Data Analysis Techniques Using Decision Trees. DAVID E. ABBEY, Loma Linda University

Gathering vs. Use of Probabilistic Information as Causes of Biased Diagnostic Decisions. LARRY D. GRUPPEN, FREDRIC M. WOLF, JOHN E. BILLI, University of Michigan

Large Sections: An Instructional Strategy. SUSAN M. HARDY, University of California, Berkeley; GARY B. BEUS, Brigham Young University

An APL Program for Iteratively Reweighted Least Squares. FERRIN HARRISON, University of Missouri

Linking Elementary Chemical and Statistical Methodologies. A. KINSELLA, J. CASSIDY, Dublin Institute of Technology—Ireland

Design and Analysis Issues in Comparative Studies in Nursing Which Use Matched Subjects. MARYELLEN MCSWEENEY, East Carolina University; BARRY M. KATZ, Saint Louis University