SCiP

Society for Computers in Psychology
Twenty-fourth Annual Conference
St. Louis, Missouri
Adam's Mark Hotel
November 10, 1994

Welcome to the twenty-fourth annual SCiP conference. Contributors have provided us with an array of papers and tutorials covering a number of current and important topics relating to the use of computers in psychological research, clinical practice, and teaching. All of us associated with SCiP hope that these presentations will be informative and useful to all those in attendance.

I would like to thank our plenary speaker, Dedre Gentner, our Past-President Doris Aaronson, our President Paula Goolkasian, our President-Elect Bill Palya, our Secretary/Treasurer Doug Eamon, each of the progam chairs, all of the presenters, and the entire steering committee (listed below). Each has contributed to the success of this conference and to SCiP.

Robert W. Allan, Program Chair
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Conference Presentations and Abstracts

Laboratory Systems & Computer Simulations

Chaired by: Margaret D. Anderson
State University of New York, Plattsburgh

Establishing a SCiPNET for Year-Round Discussion: Keeping the Information Ball Rolling

Sarah E. Ransdell (Florida Atlantic University) & Margaret D. Anderson (State University of New York College, Plattsburgh) ransdell@acc.fau.edu

Many academic and professional institutions are expanding their communicative range and inclusiveness in discussion by establishing Internet-based computer conferencing systems. This presentation will discuss characteristics of a "SCiPNET" that could serve the needs of SCiP members including the possibility of virtual conference sessions in 1995, a year-round discussion group, and a system for recruitment of new members.

A Computer Simulation Development Tool for Research and Teaching in Psychology

David V. Reynolds, M. A. Petherick (Department of Psychology) & M. Seguin (School of Computer Science University of Windsor, Ontario, Canada)

Computer simulations can be used to evaluate psychological models and theories but appropriate software must be developed for this. The approach is to simulate the essentials of a proposed model or theory, manipulate appropriate variables, and compare outcomes to those from empirical research. A simulation shell, currently used for research and teaching, is described. Specific examples are presented to show how the simulation is run.

Expansions on a Computerized Operant Laboratory: Considerations for Combining Teaching and Research

David M. Sargent (State University of New York College at Oswego) &Thomas Deelman (State University of New York at Binghamton)

The present laboratory configuration addresses concerns beyond the functional workings of a computerized research system to involve the human factors and logistical aspects of error free multi-operator operations in addition to the economics of developing, assembling, and maintaining the stations. The actual configurations (hardware and software) of the present laboratory are explained and discussed including the philosophies and experiences that led to a highly successful combined research and teaching operant laboratory.

An Inexpensive 1-Millisecond Experiment Control Interface for IBM PCs and User-Friendly Control Language

William L. Palya, Donald E. Walter, Josey Chu & Marion Montgomery (Jacksonville State University) palya@sebac.jsu.edu

This presentation details a very inexpensive digital I/O experiment control interface for any PC-ompatible computer. The preassembled cost is about $250. It plugs into a standard printer port, it allows experiment control to be written in a user-friendly experiment control language (ECBASIC) and provides for up to 21 outputs, 4 inputs, and 1 millisecond resolution. We chose to make the collection and storage of event logs transparent. It can be carried out without explicit actions by the experiment control program.

Computers & The Statistical Revolution

Chaired by: Gordon Bear
Ramapo College

Extensible Programming: Beyond Reusable Objects

David E. Anderson (Allegheny College) danders@alleg.edu

This paper describes the rapid development of a set of 30 custom designed statistical routines that make use of the special features of the NEXTSTEP operating and development environment. The speed and flexibility of this effort was made possible because of NEXTSTEP's object oriented approach to programming, including the ability to dynamically load new objects as the programming is running.

Power & Effect: A Statistical Utility for Macintosh & Windows Systems

Glenn E. Meyer (Trinity University) Gmeyer@Trinity.edu

Significance tests are not the only step in statistics. Other considerations are effect sizes and adequate sample sizes for a respectable statistical power. However, introductory statistics texts and statistical packages are spotty in their offerings of effect size and lack a friendly interface . Power & Effect offers an calculator and formula based metaphor to compute the popular measures of effect size, simple significance tests between effect sizes and sample sizes based predicted results or effect size.

Applications of a Computer Algebra System in Introductory Statistics

Rita Snyder (Denison University) snyder@cc.denison.edu

Maple, a computer algebra system, promotes conceptual learning of statistical principles without direct use of mathematics by students. Maple's symbolic computation, graphic display, and animation capabilities support an integrated set of procedures for active examination of characteristics of sampling distributions and concepts related to samples, populations, statistical decision-making, and statistical error from computer-generated visualizations. Students select parameter values for one-line commands and explore the effects of alternatives on graphical representations of distributions.

Now That Microcomputers Allow Students to Do Resampling & Permutation Tests, Let's Rethink How We Teach Statistics

Gordon Bear (Ramapo College) gbear@ultrix.ramapo.edu

A survey employs inferential statistics to generalize from a sample to a population by means of a confidence interval. Random sampling distributions and standard errors are best introduced by teaching survey methodology and interval estimation. An experiment employs inferential statistics to detect systematic differences between two or more batches of observations. Here modern alternatives to t, F, and chi-square can now be taught: permutation tests and resampling methods.

Performance & Perception

Chaired by: Matthew S. McGlone

Lafayette College

Use of Computer-Controlled Firearms Training Simulator in Perception Reaction Time Experiments

Guy O. Seymour (City of Atlanta Center of Excellence for Research on Training) Jeanne M. Stahl Morris (Brown College Center of Excellence for Research on Training), T. Talliaferro Smith (Georgia School of Professional Psychology) Gregory B. Swann (City of Atlanta Psychological Services & Employee Assistance Unit) & Derrie Ross (Morris Brown College)

This presentation describes and demonstrates a multimedia firearm training simulator which uses computer-controlled videotape presentations to present a stimulus and to record the time required for subjects to perceive a threat that must be responded to, and then to make the appropriate response. This permits the measurements of perception reaction time in discreet segments and in summation.

Desktop Flight Simulators: Simulation Fidelity and Pilot Performance

Drake R. Bradley & Stuart B. Abelson (Bates College) dbradley@abacus.bates.edu

We review some of the factors which determine how well desktop flight simulators capture the actual experience of flight. The most significant factor limiting the quality of performance in flying a simulated aircraft is the "frame rate" problem: At low altitudes and in highly detailed visual environments, the computational demands of the animation may necessitate a reduction in the number of frames displayed per second. The delayed sensory feedback which results proves to be very detrimental to sustaining smooth control of the aircraft, especially during the landing phase where such control is needed most. This finding parallels the well-known effects of delayed auditory feedback and delayed visual feedback on self-regulated performance.

Preliminary Data on a Computerized Test of Finger Speed and Endurance

Barry A. Tanner & Richard L. Bowles (Detroit Receiving Hospital and University Health Center and Wayne StateUniversity Medical School)

The T3 is a computer-based measure of finger speed and endurance. In this initial study, data was collected for a convenience sample, on both the T3 and the Reitan finger tapping test. Moderate and significant correlations were obtained between the T3 and the Reitan for both hands. Mean scores for the first 50 seconds of the T3 were greater than the mean Reitan score for the preferred hand and greater for the non-preferred hand, while the mean taps for the full two minutes of the T3 was less than for the Reitan for the preferred and less for the non-preferred hand. The mean for the last 40 seconds with the preferred hand was slower than for the first 40 seconds, while for the non-preferred hand the difference was a bit greater. These results are consistent with our intent to develop measures of both relatively pure motor speed (the first 50 seconds of the T3), motor speed combined with endurance (the full two minutes of the T3), and of finger endurance (the first 40 seconds compared to the last 40 seconds).

Children's Reading Skills: A Comparison of Traditional and Computerized Assessment

Larry D. Evans & Rhonda Tannehill (University of Arkansas for Medical Sciences)

Student ability to read computer text was investigated by comparing reading performance on recoding and phonetics tests of the Woodcock-Johnson Tests of Achievement Forms A and B. Form and administration order were randomly counterbalanced for the 40 students completing the study. Coefficients of equivalence of .92 and .85 were obtained for computer and traditional administration formats of the two tests. The resulting implications on pediatric psychological assessment, particularly psycho-educational assessment, are discussed.

A Windows Program to Assist in Preparing Reports of Emergency Psychiatry Nursing Assessments

Barry A. Tanner, Richard Marcolini (Detroit Receiving Hospital and University Health Center and Wayne State University Medical School), Eileen Howell, Jesse Bateau, & Irva Faber-Bermudez (Detroit Receiving Hospital and University Health Center)

The Emergency Psychiatry Nursing Assessment Report Framework (EP Nurse) is designed to guide the nurse through the interview and reporting process, and to produce a complete or nearly complete report of the nursing evaluation in emergency psychiatry. EP Nurse allows the nurse to produce a report in five to 10 minutes, accepting keyboard input for free-form text, and mouse clicks for selecting from lists of choices. Input includes identifying information, presenting complaints, substance use history, medical history and vitals, psychiatric medications, treatment history, history of mental illness, last hospitalization, family history of mental illness, nursing diagnosis, and nursing intervention. Written and on-line help and training were included to facilitate learning. The program includes an editor, based on highEdit, which allows the nurse to review and modify the report prior to printing, and supports various fonts. Optionally, the nurse may save the report in ASCII format and load it into another word processor before editing or printing. We believe that EP Nurse reduces both errors of omission and errors of commission, and improves documentation in the medical record. EP Nurse is intended to be used by licensed nurses familiar with the nursing assessment in emergency psychiatry. It is suitable for adult patients. Written in Visual Basic, EP Nurse requires MS Windows and nearly a megabyte of disk space for the program, runtime module, and help file.

Symposium: Hybridization of Neural Networks and Expert Systems

Organizer: Frederick J. Bremner
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Neural networks are adept at pattern recognition while expert systems are adept at logical decision making. Expert systems explicitly make decisions the way humans describe their cognitive decision making process. On the other hand, the rules used by neural networks are implicitly defined. The strategies underlying neural networks and expert systems are certainly in juxtaposition but both have their usefulness. Therefore, the papers in this symposium demonstrate the efficacy of applying a combination neural network and expert system to complex problems.

Is the Nervous System a Hybrid Vehicle?

Frederick J. Bremner (Trinity University San Antonio, Texas) fbremner@vm1.tucc.trinity.edu

A model based on Braitenberg's (1984) simulated vehicles was designed using a hybrid neural network/expert system brain. This new model proved to have superior memory when compared to the original vehicles. The parallel nature of the neural network of the current model provided more storage capacity with the same number of neurons while the serial expert system was able to use the increased memory to make fast, accurate decisions.

A Neural Network/Expert System Model of Relative Depth Perception

Stephen J. Gotts (Trinity University) sgotts@trinity.edu

Degree of binocular, horizontal disparity was used by a hybrid neural network/expert system computer model to make relative depth judgments for pairs of stimulus points. These judgments were then correlated with the actual depth relationships of the points. Results showed that image disparity was an accurate basis for judging relative depth given stimuli near the center of the visual field. The neural network component of the hybrid model served to model the brain's sensory architecture while the expert system component served as a decision maker mimicking the brain's own higher-cognitive, rule-based process.

Learning and Encoding Higher-Order Rules in Neural Networks

Daniel S. Levine (University of Texas at Arlington) b44dsl@utarlg.uta.edu

Some researchers state that neural networks are fine for pattern recognition and categorization, but complex rule formation requires a separate "symbolic" level. However, the human brain is a connectionist system, and however imperfectly does complex reasoning and inference. Familiar modeling principles (e.g., Hebbian learning, lateral inhibition, opponent processing, neuromodulation) could recur, indifferent combinations. in architectures that can learn diverse rules: go to the most novel object; alternate between two given objects; touch three given objects, without repeats, in any order et cetera. Frontal lobe damage interferes with learning such rules. Hence, network models should include a frontal module along with hippocampal "episode setter") and amygdalar ("emotional evaluator") modules.

Complex pattern matching: A hybrid model using neural networks and ACT-R

J. Gregory Trafton (NTI, Incorporated)

We have been looking at how expert DSOs (Defensive System Operators) on a B1 bomber examine a complex series of signals, categorize whether that signal is dangerous or not, and then make a decision and make a decision based on those signals. This decision is made more complicated because an on-board computer sometimes identifies the signal incorrectly. Therefore, the DSO must compare the actual signal to the system ID of that signal. The overall task of the model will be to identify a particular signal, compare it to the system's identification, and then take a particular action, depending on the final ID. A neural network will perform the signal identification and comparison with the on-board system. A production system will then take this information and perform some action (e.g., if the threat is dangerous, defensive action should be taken; if the threat is benign, it should be ignored).

Symposium: MOSAIC and the Information Superhighway: A Virtual Tiger in Your Tank

Organizer: C. Michael Levy
University of Florida

The information superhighway is at our office door and most of us already have the basic tools needed to explore and to contribute to it. This presentation will take the audience on a guided tour, using MOSAIC, the public domain interface to the World Wide Web, a truly global database. With MOSAIC software running on a modern PC (with Microsoft Windows), Macintosh, or a high-end workstation, we can access databases via the Internet to store, search, edit, or retrieve text-based materials as well as related images, sounds and full-motion video.

MOSAIC and the Information Super-Highway: A Virtual Tiger in Your Tank - The Overview

C. Michael Levy (University of Florida)

For much of this century, visionaries have imagined a global knowledge database -- information that could be accessible by anyone at any time, no matter where the information was located, where the linkages between related components in the data base would be conveniently established, and users could quickly and efficiently assemble all of the available information pertaining to a query. Technology has finally caught up with these fantasies. Today it is possible to realize them on a world-wide basis through access to the World-Wide Web (WWW). The WWW is a wide-area hypermedia information retrieval initiative that aims to give universal access to a large universe of documents. The Web, through software such as MOSAIC, provides a simple and consistent means for people to access a variety of information stored as text, graphics, video, and sound files on their desk top computers.

Linked Gopher and WWW Services for the American Psychological Society and College Pychology Department

John H. Krantz Hanover College

The promise of the Internet is fast access to vast amounts of information. However, many of the protocols to date have required a fair amount of technical knowledge to use and thus makes finding desired information arduous and the alphabet soup of protocols (ftp, http, telnet, gopher, wais, WWW to name some) can make finding a desired piece of information a bewildering experience. The recent development of Internet protocols that are much easier for most people to use, gopher and hypertext transfer protocol (http), creates a great opportunity for the promise of Internet to be realized. However, to realize the advantages of gopher and http would seem to require the development of easy-to-find locations with information organized to minimize the searching and frustration that results from vaguely looking for a quickly needed piece of information. This presentation discusses how linked gopher/WWW resources have been developed for both the American Psychological Society and a small psychology department.

Information on the World-Wide Web: How Selective Should We Be?

Robert W. Allan & Philip S. Kostenbader (Lafayette College)

MOSAIC provides users easy access to a vast database which includes a set of utilities designed to set up a server site. Once a department (or institution) has established a server and is part of the World-Wide Web, consideration must be given to what information will be made available to those making contact with the server. Several possible strategies for arranging information on the Web will be discussed, as well as questions which may guide the selection of information to be made available on a

server.

Using HyperText Markup Language (HTML) to Create Information Server Documents

Josey Chu, Donald E. Walter, & William L. Palya (Jacksonville State University)

The productive use of the information superhighway (World Wide Web) requires a standard language for the source of that information, one of these is the HyperText Markup Language (HTML). The incredible power of HTML is because it enables Mosaic to transparently retrieve images, movies or audio files from virtually any computer on earth, if an item is "clicked". This tutorial will cover using HTML to create your own information for the Superhighway; subsequently anyone anywhere with Mosaic can enjoy your document.

Tutorial: A Selection of Student Statistics Programs for the Macintosh

Richard S. Lehman (Franklin & Marshall College)

This tutorial illustrates 6 student-level statistics programs for the Macintosh. The session will illustrate four general purpose programs (DataDesk, Minitab, StatView, and Student SYSTAT) and two special purpose ones (DataSim and InStat). The intent is to provide a brief introduction to the appearance, operation, and capability of each program as an aid to instructors or possible users trying to select a package.

Tutorial: Using Multimedia to Influence Public Attitudes

Joel Epstein (Missouri Institute of Mental Health)

The Missouri Institute of Mental Health has developed an interactive multimedia program to educate the general public about the scientific basis of mental and addictive disorders. The program is now part of a permanent exhibit at the St. Louis Science Center. The presentation will cover a brief history and definition of multimedia, as well as a discussion of why multimedia is an educationally sound teaching tool. The program will be demonstrated and research on its effectiveness in changing the public's attitudes towards people with mental illness will be presented.

Symposium: Psychological Research using Computer-Game Technology

Organizer: David A. Washburn
Georgia State University, psydaw@gsuvm1

Computer games provide challenge and entertainment for individuals of all ages. These games typically require an impressive repertoire of behaviors, yet have relatively untapped potential for efficient, novel, and systematic investigations of learning, attention, memory, and problem solving. We will present several examples of psychological research with computer-game technology, each of which will illustrate some of the promises and pitfalls of this experimental paradigm, as well as its applications in the experimental analysis of behavior, human factors, cognitive, and comparative psychology.

The Matching Game: Optimization, Maximization or Melioration

Robert W. Allan (Lafayette College) allanr@lafayette.edu

The Matching Law suggests that animals will allocate responses as a function of reinforcer availability, that is, if one choice produces more reinforcement a greater proportion of total responding will be allocated to that choice. Indeed, there tends to be a match between proportions of reinforcers delivered and response allocation. A computer game which delivers simulated coins (of experimenter-selected denominations) for responding on either of two keys, was developed to test the generality of the Matching Law. The data suggest that, even within a single 10-minute session, matching functions may be obtained. This program may also be used to test optimization, maximization and melioration accounts of the Matching Law.

On Trekking to Operant Frontiers

David A. Case (University of California, San Diego)

Only recently have psychologists begun to explore the unmapped territory of validating numerous detailed operant principles in nonclinical human populations. Ideally such testing begins under laboratory conditions before being extended to riskier real-world contexts. Several concerns limit simplistic lever-pressing tasks superficially patterned on nonhuman lab studies. A realistic uniform laboratory context for responding would help address several of them. Computer game research conducted by my colleagues and me is proffered as an exemplar.

The Learning Strategies Program and the Video Game at its Core: The Costs and Benefits of Using a Video Game as a Research Tool

Emanuel Donchin (University of Illinois at Urbana-Champaign) edonchin@s.psych.uiuc.edu

A multi-investigator program of research conducted (1984-1986) in 6 different laboratories shared a common "video game" called Space Fortress. The program examined the degree to which supervised practice can improve the acquisition of a complex skill, and compared the effectiveness of different approached to supervised practice. The design of the game so as to enhance the effectiveness of the research program, as well as the design and implementation of the research program, will be described.

A Procedure for Studying Strategy Development in Humans

Fernando A. Gonzalez & Mike Cathcart (Center of Excellence for Research on Training, Morris Brown College) fgcert@aol.com

An early version of the computer game Star Trek was modified to conduct behavior research. By appropriate use of weapon and defense systems, the starship can kill enemy ships and avoid destruction. The player's moves and the time and state of the game environment when each move occurs are recorded. The procedure tracks performance changes over time very well, and allows the dissection of performance into simpler components that reflect changes in the subject's strategy.

Computer Games: Paradigms of Opportunity

David B. Porter (United States Air Force Academy) porterdb%dfbl%usafa@pcmail2.usafa.af.mil

Computer games offer psychological researchers unique opportunities. Games allow subjects to engage in meaningful, complex activities and yet also permit researchers the ability to record sufficient data to reconstruct critical aspects of human performance. By combining several convergent analytical methodologies, computer games can yield results relevant to substantial theoretical questions. The Whale Game was originally developed to demonstrate the distinction between alternative modes of information processing but has subsequently been used to explore a wide variety of social, cognitive and human factors questions.

Game-like Tasks: Leveling the Playing Field

David A. Washburn & Jonathan P. Gulledge (Georgia State University & Morris Brown College Center of Excellence for Research on Training) psydaw@gsuvm1

Game-like computer tasks offer many benefits for psychological research. In this paper, the usefulness of such tasks to bridge population differences (e.g., age, intelligence, species) is discussed and illustrated. A task called ALVIN was used to assess humans' and monkeys' working memory for sequences of lights and tones. Comparison of similarities and differences between the species is possible because the two groups were tested with exactly the same game-like paradigm.

Cognitive Models & Simulations

Chaired by: Michael Ranney
University of California, Berkeley

Protocol Modeling, Bifurcation/Bootstrapping, and Convince Me: Computer-Based Methods for Studying Beliefs and Their Revision

Michael Ranney & Patricia Schank (University of California, Berkeley) ranney@cogsci.berkeley.edu

This paper traces a progression of computer-based methods for studying and fostering the structure and on-line development of knowledge. Each system employs ECHO, a connectionist model of explanatory coherence. First, verbal protocols were modeled post-hoc. Next, ECHO predicted subjects' believability ratings. Then, the bifurcation/bootstrapping method was developed to account for background knowledge and assess inter-coder reliability. Finally, Convince Me, our "reasoner's workbench," automates much of this data-gathering. These systems' empirical results will be discussed.

A Teaching Simulation of the Dynamics of Action Model Using STELLA-II

Virginia Blankenship, Justin Tumlinson (Northern Arizona University) & Mark A. Sims (MSI Professional Services, Incorporated) vrb@nauvax.ucc.nau.edu

The Atkinson and Birch (1970) dynamics of action model of behavior is included in many Motivation textbooks, but the details are left out. In this presentation the theory is outlined, research findings are reviewed, and a simulation model using STELLA-II is presented. STELLA-II, an icon-based program, provides a visual representation of the model that students can follow with graphical and tabular output and animation of the rise and fall of parameter values.

A Model for Assessing Student Interaction with Educational Software

Steve Cohen, Frank Tsai & Richard Chechile (Tufts University) scohen@jade.tufts.edu

We present a simple model of generative learning that permits us to define three kinds of interactions and a system for tracing and recording how student use educational technology. We believe this model will maintain a link between interaction and cognition, permitting one method to assess a wide range of educational technology environments.

Searching: The Horizon Today's Research Cutting Edge in Verbal Database Retrieval

Walter A. Sedelow, Jr. & Sally Yeates Sedelow (The University of Arkansas, Little Rock & University of Arkansas Graduate Institute of Technology & University of Arkansas College of Medicine)

A report from the research frontier out of which MOSAIC, GOPHER, etc., emerged, (1) as to related forthcoming developments in whole-language semantics & thesauri and the browsers they imply for SSA ['Say': Symbol Systems Access], (2) as to comparative classification analysis and its implications for multi-language, full-text browsing and retrieval by means of Soft Computing, (3) as to OOPS [Object- Oriented Programming Systems] vs. rule-based, data-driven languages [e.g., PICASSO] for such functions, and (4) as to the formal Spangenberg Technique for ensuring that a reader (or speaker) is using terms in precisely the same senses as an author (or other speaker). Thesedevelopments all have a bearing on, inter alia, the prospective feasibility of 'global virtual psychological laboratories.'

Analysis & Visualization

Chaired by: Doris Aaronson
New York University

Visualization of Multivariate Data: Human Factors Considerations

Edward Colet & Doris Aaronson (New York University) edc@xp.psych.nyu.edu

Recent software provides new tools for visualizing multivariate data which facilitate data analysis. We focus on (a) the learnability and use of visualization systems and (b) the perceptual and cognitive processes involved in viewing visualizations. Effective visualization systems support a broad range of user tasks and abilities, are easy to learn, and provide powerful and flexible output formatting. Effective visualizations incorporate Gestalt and other perceptua and cognitive principles that encourage more rapid, top-down automatic processing, rather than slow, bottom-up controlled processing.

Improving the Interpretability of Research Results Through Multivariate Visualization

Yu, Chong Ho & John T. Behrens (Arizona State University) chongho.yu@oubbs.telecom.uoknor.edu

The complexity of psychological research often leads to the collection and analysis of multivariate data. Nevertheless, comprehension of multivariate data expressed in algebraic formula is not always straight-forward. This paper discusses the use of geometric analogy, color, and animation in the visualization of multivariate systems. Visualization software based on these principles is also described. The paper concludes with a discussion of the implications of data visualization for statistical instruction, data interpretation, and communication of results in psychological research.

Learning To Think About Multivariate Experimentation Through Interactive Computer-Based Simulation

Robert C. Becklen (Ramapo College of New Jersey) rbecklen@ultrix.ramapo.edu

The increasing availability of substantial and inexpensive computing resources makes possible more powerful simulation and data analytic approaches for researchers in psychology. Interactive simulation, in particular, can be a useful tool for generating intuitions about how to uncover complex relationships in multivariate data. The active learning involved captures many aspects of the experience of real research. This, in turn, can lead to a deeper understanding of principles of experimental design. This presentation will describe PROSIMEX, a program which allows students to interactively produce simulated data in connection with realistic problem formulations. The program is easy and intuitive to use, yet capable of simulating sufficiently complex relationships in multivariate data to expose the inadequacy of haphazard or suboptimal experimentation. Internal model specification is easy and flexible and entirely under the control of the teacher. Models can be based on prior analyses of real data, or be invented by the teacher. Complete control over data transforms as well as rules for noise generation, allow simulated results to closely mimic real data.

Educational & Clinical Applications

Chaired by: Peter Hornby
State University of New York, Plattsburgh

Sources of Expert Advice: A Comparison of Peer-Reviewed Advice from the Literature to that from an Automated Performance Support System

Matthew G. Hile, Bagher B. Ghobary (University of Missouri-Columbia at the Missouri Institute of Mental Health) & Donna M. Campbell (Webster University) mimhmh@mizzou1.missouri.edu

This study compares the treatment suggestions offered by these two sources of expert advice across 30 clients. Four clinicians obtained consultations from the Mental Retardation-Expert (MR-E), an automated performance support system, for client descriptions abstracted from the literature. The results indicated that MR-E, when compared to the literature, offered more positive proactive treatment suggestions, relied more on accelerative rather than decelerative approaches, and offered more treatments from which the clinician could choose.

Response Burden Versus Reliability of the CAGE, Short-MAST, and AUDIT Alcohol Screening Measures

Ron D. Hays, Jon F. Merz (RAND) Ronald Nicholas (Center for Counseling) & Ron D. Hays (RAND) ronald_hays@rand.org

We administered the CAGE, the Short-MAST, and the AUDIT to 832 clients at drinking driver treatment programs in Southern California. Correlations among the alcohol screening measures ranged from 0.62 (CAGE and AUDIT) to 0.70 (CAGE and Short-MAST). As expected, response time for the CAGE (31 seconds) was quicker than for the Short-MAST (97 seconds) and the AUDIT (131 seconds), but the internal consistency reliability of the CAGE (0.69) was the lowest (reliabilities of 0.84 and 0.83 for the Short-MAST and AUDIT, respectively). We recommend the Short-MAST as the tool of choice if

the extra minute of administration time it requires relative to the CAGE is not critical.

Computers and Sexuality Education: Tapping Into the Wild Side

Ellen F. Rosen (College of William and Mary) & Linda C. Petty (Hampton University)
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To see if observing information exchanges in "cyberspace" had a positive effect on computer usage and attitudes, students in a sexuality class were given an Internet project. Their pre- and post-project computer attitude and utilization reports were compared to those of a traditional computer usage experimental methods course. Overall, the e-mail/Internet project did not have a positive effect on computer usage and attitudes.

Design and Use of a U.S. Census Data Computer Laboratory for Teaching Undergraduate Research Methods

M. Ann Drake, Jeanne M. Stahl & Juliana Sparks Lancaster (Morris Brown College)

This presentation describes the design and use of a U.S. census data laboratory, which uses CD-ROM and other on-line data sources, for teaching psychology and sociology majors one component of an introductory course in research methods. The information presented is intended for teachers at non-research institutions, such as small colleges, who want to expose their students to research within the classroom setting.

Tutorial: Behavioral Analysis of Interactive Computer-Programmed Instruction

Darrel E. Bostow, Kale M. Kritch & Brenda Tompkins (University of South Florida)
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The authors describe methods of instructional design and a particularly useful DOS authoring program called PCCAI. Instructors who wish to create their own interactive tutorials and classroom tests will find the techniques, products, and software to be especially useful. The authors have created tutorials which teach how to make tutorials, as well as tutorials about basic learning principles. A useful outline processor which interfaces with WordPerfect macros will be described. The files produced with the outline processor, WordPerfect macros, and the authoring program enable more rapid production of tutorials and tests.

Tutorial: A Behavioral Systems Approach to Adaptive Computerized Instructional Design

Roger D. Ray (Rollins College) rdray@rollins.edu

A working computerized instructional system which meets most behavioral systems analysis (Ray & Delprato, 1989) design specifications for presenting adaptive programmed multimedia instructional materials and laboratory simulations is detailed through a series of screen illustrations and explanations. This instructional software system, called MediaMatrix, is an authoring environment and a delivery

vehicle which incorporates an automated knowledge generation system. It tracks all interactions between the system and the user and builds an estimate of "concept association networks" (Verplanck, 1992) to anticipate a learner's developing knowledge and skill base.

Round Table: The PsyScope System for Conducting Experiments on the Macintosh

Organizers: Jonathan Vaughan (Hamilton College), Brian MacWhinney & Jonathan Cohen (Carnegie Mellon University) jvaughan@itsmail1.hamilton.edu

The PsyScope experimental control language is becoming widely used for perceptual, cognitive, and psycholinguistic experiments. This round table session invites users of the system to demonstrate successful applications of PsyScope and to allow potential new users to explore new applications. A computer running PsyScope with overhead display will be available for demonstration and for the exchange of PsyScope scripts.

Tutorial to MEL 2.0: A General System for Computerized Experimental Research on X86 Computers

MEL Lab: Experiments in Perception, Cognition, Social Psychology and Human Factors

Walter Schneider (University of Pittsburgh) schneider@pittvms

The tutorial will present an overview of the Micro Experiment Laboratory with emphasis on the new features for MEL 2.0. The system allows control of time critical computerized data collection. The new features include: Sound support; extended graphics support; extended memory support for bitmap operations and ANALYZE; new and improved response box and voice key; dual monitor support; atomated reporting of critical timing events; and automatic customization of feedback messages. We will illustrate how to: Present pre-recorded sound files as stimuli; utilize the extensive library of new sound commands to create novel combinations of sound files on the fly; create, store, and customize sound stimuli (e.g., record letters and ensure that each has a standard voice onset time); collect subject response latencies; and record subject vocal responses. The Time Audit tutorial will illustrate how laboratory supervisors can utilize this powerful program to ensure the accuracy of critical timing events in MEL programs.

MEL Lab provides students and teachers 25 packaged experiments demonstrating classic psychological experimental results while teaching psychological research methodology. The system is designed for easy use by instructors with preset analysis forms and study questions to quickly get individual and group data analyzed. Students can also modify experiments with an easy-to-learn system for presenting basic experimental procedures.

General Meeting

Presentation of the N. John Castellan Student Paper Award to Edward Colet (New York

University)

Presented by Doris Aaronson (New York University)

Invited Speaker:
Introduced by Robert W. Allan (Lafayette College)

Dedre M. Gentner (Northwestern University)

Comparison, Cognition and Computation

Presidential Address:
Introduced by William L. Palya (Jacksonville State University)

Paula Goolkasian (University of North Carolina, Charlotte)

Psychology and Its Role in Information Technology

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