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**Society for Computers  
In Psychology**

**Seventeenth Annual Meeting  
Seattle Sheraton, Seattle  
Thursday, November 5, 1987**

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As in the past, I used a two-stage call for papers. In the first stage, topics were solicited from the membership. These topics were then listed as suggestions for papers and symposia in the formal call for papers. I thank those who suggested topics for the conference, and especially those who went on to organize a symposium or tutorial.

I also thank members of the program committee - Doris Aaronson, Peter Dixon, Ira Fischler, Richard Lehman, George McConkie, William Palya, Thomas Perara, Walter Schneider and Michael Yost - who reviewed papers for the program and offered suggestions for the papers which will appear in the proceedings issue of *Behavior Research Methods, Instruments, & Computers*. Special thanks too, to Jonathan Vaughan, SCIP Secretary-Treasurer, for his advice and assistance in all phases of setting up the program.

The Society awards an annual prize for the best submitted paper written by a student. The award includes a cash prize and a one-year subscription to *BRMIC*. A number of these submissions were accepted onto the program, and are indicated with a \*\* - thanks for the good work! The winner will be announced at the conference.

Mary Beth Rosson  
IBM Watson Research Center  
Program Chair for 1987

*Please note: Smoking is not permitted in the meeting rooms during the sessions.*

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## Special Events

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*Wednesday, November 4*

8:00 - 9:00 pm (Cedar Room)

**Steering Committee Meeting**

*Thursday, November 5*

8:30 am - 3:30 pm (in front of West Room)

**Registration and Software Swap**

11:00 am - 12:00 pm (Grand Ballroom A)

**Presidential Address: Computers, Science and Technology**

Cynthia Null, William and Mary College

5:00 - 5:30 pm (Grand Ballroom A)

**Members Meeting**

7:30 - 10:00 pm (Grand Ballroom A)

**Invited Symposium: Tools and Techniques for Connectionist Modeling**

James L. McClelland, Paul W. Monroe, Walter Schneider, University of Pittsburgh, and James A. Anderson, Brown University

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## Morning Sessions

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9:00 - 10:40 am (West A)

**Symposium: An Introduction to the Walter/Palya Experiment Controller and Its Networking Software; with Users Group Meeting**

Chair: William L. Palya

This session is targeted to researchers who wish to develop an integrated computer-based solution to running digital experiments such as operant or Pavlovian conditioning. It is also applicable to those who wish to simply interface their computer to their equipment, or to obtain a stand-alone experiment control computer. The initial presentation will provide an overview of the Walter/Palya experiment controller. It is a low cost interface between most computers and most behavioral research equipment. Subsequent papers will present network control and communications software as well as other support software. Factors involved in the construction and implementation of the controllers will also be covered. A final interactive period will be provided.

9:00 - 9:20

**An Introduction to the Walter/Palya Controller and ECBASIC**

William L. Palya, Jacksonville State University

9:20 - 9:30

**The LabTop Macintosh: Hardware, Firmware, and Software for Experiment Control of Animal Behavior Research**

Lee Cooper and John Gibbon, New York State Psychiatric Institute

9:30 - 9:50

**A Software Environment for Macintoshes in the Research Lab**

Ron Weisman, Queen's University

9:50 - 10:05

**Construction and Implementation of a Low-cost Electronic Experiment Control Interface**

J. Knepton and J.A. D'Andrea, Naval Aerospace Medical Research Laboratory

10:05 - 10:20

**Using an IBM Personal Computer to Network Walter/Palya Experiment Controllers**

Mark Pevey, Emory University

10:20 - 10:40

**The Walter/Palya Experiment Controller Users Group Meeting and Help Session**

Donald E. Walter, Jacksonville State University

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9:30 - 10:10 am (West B)

**Computer-based Education**

Chair: Doris Aaronson

9:30 - 9:50

**Computer-based Activities for Teaching Engineering Psychology Concepts**

Paul Reed, AT&T Bell Laboratories

A set of interactive computer exercises for students in experimental psychology has been developed at the University of California, Santa Barbara. Each exercise consists of a program that conducts an online experiment, including an analysis of student-generated data, and full supporting documentation explaining the program and the experiment.

9:50 - 10:10

**Development and Use of Personal Computer Software in Teaching Differential Psychodiagnostics**

Chris E. Stout, Forest Hospital and Foundation

This paper deals with the user of personal computers in the instruction of differential diagnosis in psychiatry. The Diagnostic and Statistical Manual-III (DSM-III) outlines to the student what symptoms to consider when attempting to arrive at an accurate differential diagnosis of eight broad psychiatric categories. Specifically, this paper deals with a program developed to instruct a medical or graduate student in the science of such decision making.

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9:30 - 10:30 am (Grand Ballroom A)

**Using Three-Dimensional Graphics in Psychological Research**

Chair: Michael Yost

This symposium will be presented by four researchers who are experienced in the use of computer-generated three-dimensional graphics in psychological research. Applications presented will include: topographical mapping of electropsychological data, real-time simulation of air traffic control systems, mapping and rotation of multivariate data, and plotting and rotation of

physiological data. The symposium will include the use of IBM, Apple, and VAX computers.

9:30 - 9:50

**Three-Dimensional Graphing and Analysis of Neuropsychological Data**

Michael Yost, Trinity University, and Frederick Bremner, Brooks School of Aerospace Medicine

9:50 - 10:10

**Three-Dimensional Graphing and Evaluation of Multivariate Data**

Larry Gindler, Trinity University

10:10 - 10:30

**Three-Dimensional, Online Color Graphics Representation In Complex Decision-Making Tasks**

Douglas Eddy, NIT, Inc.

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### Presidential Address

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11:00 am - 12:00 pm (Grand Ballroom A)

**Computers, Science, and Politics**

Cynthia Null, William & Mary College

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### Afternoon Sessions

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1:15 - 2:35 pm (West A)

**Tools for Research in Perception and Cognition**

Chair: Mary Beth Rosson

1:15 - 1:35

**A Flexible Programming Language for Generating Stimulus Lists for Cognitive Psychology Experiments\*\***

Steven Greene, Roger Ratcliff, and Gail McKoon, Northwestern University

A programming language to simplify the production of stimulus lists for cognitive psychology experiments is described. The language allows the user to manipulate a wide variety of stimulus materials, including single words, sentences, and multi-line stories. Two sample programs are provided and explained. An interface to a real-time experimental system is also described.

1:35 - 1:55

**A Sample to Disk System for Psychomusical Research**

Roger A. Kendall, University of California, Los Angeles

A hardware/software system was developed which permits audio-bandwidth signal quantization directly to/from hard disk. Using an IBM-AT or compatible, the system is cost-effective and device-independent. Software functions allow for automated aural and graphical signal analyses. Perceptual experiments using contextual, natural-instrument stimuli, and which take advantage of the immediate and random-access provided by this system, are described.

1:55 - 2:15

**A New Technique to Rapidly Assess the Resting States of the Eyes and Other Threshold Phenomena: The Modified Binary Search (MOBS)\*\***

Richard A. Tyrrell, Pennsylvania State University, and D. Alfred Owens, Franklin & Marshall College

A technique was developed to automate subjective measurement of the resting states of the eyes. This technique, the Modified Binary Search (MOBS), evolved from the binary search and a commonly used manual technique (bracketing). Monte Carlo simulations indicate that the MOBS provides more precise measures with one third to one half as many stimulus presentations as a conventional staircase.

2:15 - 2:35

**A Microcomputer-based Software Package for Eye Monitoring Research**

George W. McConkie, University of Illinois, Charles W. Scouten, Stoelling Company, and Patrick K. Bryant, Reading Technology, Inc.

A software package, written in C for IBM-PC and AT type computers, collects, stores, and reduces eye position and pupil size data. It works with computer or non-computer displays, and includes the ability to collect additional channels of data (i.e., EEG). Data structure and program capabilities are discussed.

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1:15 - 3:00 pm (West B)

**Symposium: Apple-Psych: A Pascal-based System for Real Time Experiments**

Chair: Bob Burke

1:15 - 1:30

**What is the Apple-Psych System?**

Suzanne Barnes, Suzanne Barnes and Associates

Apple-Psych is a system of software subroutines written in Apple Pascal and machine language designed to run real time psychological experiments

on the Apple II, II+, and IIE. A standard system installation is described followed by a discussion of its expandability through the addition of specific hardware and software. This discussion includes expansion boards, expansion board handlers, and various input and output devices. The presentation includes demonstrations of sample programs.

1:15 - 1:35

**Generalizing the Apple-Psych System**  
Gil Osgood, University of Oregon

Each upgrade of microcomputer hardware or software for psychological experimentation usually requires developing new programming systems and learning new programming techniques. To minimize this problem a set of subroutine calls, derived from the Apple-Psych system, is described that can be implemented with different dialects of Pascal on different microcomputers. In particular, a generalized system is discussed that has been implemented both for UCSD Pascal on the Apple IIs and for Turbo Pascal on the IBM PC and compatibles.

1:50 - 2:05

**Voice Recognition with the Apple-Psych System**  
David B. Boles, Rensselaer Polytechnic Institute

Use of the Introvoice I voice recognition board (The Voice Connection, Irvine, CA) with the Apple-Psych System is described. The device augments the EPROM, keyboard ROM, and keyboard encoder chip in Apple II series computers and provides speaker-dependent recognition of up to 80 words. Introvoice II, an upgrade, provides up to 160 words. Since the operation of Introvoice is software-transparent, the Apple-Psych system recognizes its output as console (keyboard) input, making it useful as a response collection device. The keyboard continues to operate normally, in parallel with voice recognition. Problems and solutions for response recognition and timing are discussed, and illustrative experimental data are presented.

2:05 - 2:20

**Real Time Language Comprehension Research Using the Apple-Psych System**  
Mark Beeman and Morton A. Gernsbacher, University of Oregon

We describe the use of the Apple-Psych system to conduct language comprehension experiments. We have implemented on this system various experimental paradigms, including cross-modal priming, a moving window divided attention task, and several reading time methodologies. Most recently we have used this system to present lin-

guistic material to subjects and control a PDP 11<sup>0</sup> which records 16 channels of event related potentials. This latter application is the primary focus of this paper.

2:20 - 2:30

**Production and Control of Auditory Signals in Attention Research**

Bob Burke, South Dakota State University

A technical issue in auditory spatial attention research is how best to provide low cost, accurate control of the frequency, duration, and location of acoustic signals. Three solutions to the problem are compared, use of a Mountain A/D D/A card, use of the internal oscillator of the Apple II, and use of an external oscillator chip. For each system the unique drawbacks and advantages are discussed. All share some common problems of external speaker interface, timing, and control software. Hardware and software solutions implemented on the Apple-Psych system are presented.

2:30 - 3:00

**Apple-Psych User Forum: An Open Discussion to Address User Issues**  
Group discussion

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1:15 - 3:10 (Grand Ballroom A)

**Tutorial: Applications of Microcomputers in Teaching**

Chair: N. John Castellan, Jr.

This session is a series of presentations directed to people interested in learning more about using computers in teaching. The session begins with an overview of instructional computing. This is followed with three case studies in the application of computers in teaching. After integrative summary comments by the discussants, the session will conclude with an open discussion in which participants will be able to respond to specific questions.

1:15 - 1:30

**Selection of Software in the Instructional Laboratory**

Darrell Butler, Ball State University

1:30 - 1:45

**Use of Software in the Instructional Laboratory**  
Douglas B. Eamon, University of Wisconsin-Whitewater

1:45 - 2:05

**Using Computers in Teaching Introductory Psychology**

Peter Hornby and Margaret Anderson, Plattsburgh State University of New York

2:05 - 2:25

**Learning Science and Making Science: Using the Computer in the Psychology Laboratory\*\***

Gretchen Conn, Paul Stafiniak, Madeline DiPasquale, and Lynn Harper, Drexel University

2:25 - 2:45

**A Computer-Driven Undergraduate Laboratory Curriculum and Related Support Logistics**

Charles R. Leith, Marilyn D. Hamm, Connie Duncanson, and Tanja Senegal, Northern Michigan University

2:45 - 3:15

**General Discussion**

Thomas T. Hewitt, Drexel University, and N. John Castellan, Jr., Indiana University

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3:15 - 5:00 pm (West A)

**Symposium: The Desktop Experimental Laboratory: Eliminating Programming in Professional and Undergraduate Research**

Chair: Walter Schneider

3:15 - 3:40

**MacLab: A Macintosh System for Psychology Labs\*\***

Dan Constin, Harvard University

MacLab is a program that makes the Apple Macintosh act like an intelligent tachistoscope. MacLab takes MacPaint pictures and displays them as slides. Trials made up of picture "events" can be displayed in specified orders, and output saved to disk. Measurement of subject responses is accurate to millisecond level. Creation of powerful experiments is quick and easy.

3:40 - 4:05

**All Purpose Tester: An Experimental Development System for the IBM PC and Apple II**

Gregory S. Foltz, Colorado Springs, and Steven Poltrock, MCC

Systems for creating and running psychology experiments on an IBM PC or Apple II are described. Without programming, psychologists using the APT systems can construct and conduct an experiment, summarize the data, and revise the experiment. The systems are easily used by students but pow-

erful enough to be used by psychologists in their research.

4:05 - 4:30

**Micro Experimental Laboratory: A System for Research**

Walter Schneider, University of Pittsburgh

Micro Experimental Laboratory (MEL) provides an integrated system approach for experimental research. The researcher fills in forms and MEL writes the experiment. MEL includes computer tutorials, easy-to-learn user interfaces, automatic programming, a compiler, real-time data acquisition, database management, statistical analysis, and subject scheduling. It can perform most reaction time, questionnaire, and text experiments with little if any programming. It operates on standard IBM PCs maintaining millisecond accuracy timing with high speed text and graphics presentation. It was designed for professional research while being easy enough to use in undergraduate classes.

4:30 - 5:00

**A Critical Evaluation of Software for Experiment Development in Research and Teaching**

Darrell L. Butler, Ball State University

The above packages and other packages are reviewed from the users' perspective for research and teaching. Packages were tested via implementing a variety of experimental paradigms. The ease of learning and use were evaluated. Guidelines for setting up research and undergraduate laboratories are presented.

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3:15 - 3:55 pm (West B)

**Microcomputer Programming Techniques**

Chair: William L. Palya

3:15 - 3:35

**Repairing the Microsoft BASIC RND Function**

Daniel S. Lordahl, Brock University

Difficulties with the Microsoft BASIC function for generating random numbers are cited and new problems reported. A variety of fixes is suggested which allow use of some of the speed of the original function and which produce greatly improved pseudorandom numbers. One particular fix is explored in some detail.

3:35 - 3:55

**Ampersand Utilities for Applesoft**

Douglas B. Eamon, University of Wisconsin-Whitewater

A large variety of machine language utilities which use Applesoft's ampersand (&) command are available. A selection of some of these routines will be examined, and examples of how they are implemented and used will be discussed. Disks containing many such routines will be provided.

3:45 - 4:45 pm (Grand Ballroom A)

**Computer Use by Psychology Professionals**

Chair: Mary Beth Rosson

3:45 - 4:05

**The Electronic Spreadsheet as a Professional Productivity Tool**

Thomas T. Hewitt, Drexel University

The focus of this paper is on the use of a personal computer and its application programs as a professional productivity tool. The intent is to illustrate ways faculty can use computer technology in managing complexity and change in their professional lives. Examples illustrate the use of an electronic spreadsheet as a memory aid and tool in monitoring work habits and setting task priorities.

4:05 - 4:25

**The Languages We Use**

Richard S. Lehman, Franklin & Marshall College

Members of the Society for Computers in Psychology responded to a survey asking about their use and preferences in programming languages. Results summarize current hardware and software use, and suggest a relationship between training, task, and language choice and usage.

4:25 - 4:45

**PSYCHNET -- A Computerized Software Information System**

Margaret Anderson, Peter Hornby, SUNY Plattsburgh, and David Bosak, SUNY Oswego.

A working paper to describe the current status and obtain feedback on the development of a computerized information system to catalogue software, post user comments, and maintain a directory of

software developers and users. We anticipate that the system will be available early in 1988, and are interested in potential user reactions before final implementation.

4:05 - 4:45 pm (West B)

**Modeling Complex Processes**

Chair: N. John Castellan, Jr.

4:05 - 4:25

**A Computer Model of Inflection Learning\*\***

Michael J. Liebhaber, University of Kansas

A brief overview of a program that creates and modifies inflectional paradigms is presented. The model covers a subset of the rules for learning inflectional paradigms outlined by Pinker (1984). One goal of the model is to understand how elements that are crucial to the theory might interact to form and expand word-specific paradigms. Considerations regarding the structure of the lexicon, input, lexical entries, and lexical access are discussed.

4:25 - 4:45

**An Expert System for Music Perception**

Jacqueline A. Jones, Benjamin O. Miller, and Dan L. Scarborough, Brooklyn College

We describe an expert system written in Pascal to simulate part of Lerdahl & Jackendoff's (1983) theory of music perception. This program, a production system based on a Hearsay architecture (Barr & Feigenbaum, 1981), illustrates a number of techniques including program modularity, complex data structures, and simulated parallelism using operating system concepts.

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## Evening Session

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7:30 - 9:30 pm (Grand Ballroom A)

**Invited Symposium: Tools and Techniques for Connectionist Modeling**

Chair: Walter Schneider

7:30 - 8:30

**A Software System for Teaching Connectionist Modeling**

James L. McClelland, Carnegie Mellon University

A software system and handbook for teaching Parallel Distributed Processing (PDP) simulation

modeling techniques is described. The system provides a structured opportunity to experiment with and learn about PDP. The talk will describe the basic philosophy of the system, topics covered, and outline the implementation. Demonstrations will illustrate how key ideas in connectionist learning models are taught through the package. Issues relating to the use of the system and this approach to modeling psychological processes are discussed.

8:30 - 9:00

**Teaching Dynamical Systems as a Psychology Course**

Paul W. Munro, University of Pittsburgh, and James A. Anderson, Brown University

Dynamical systems are a fundamental component of Formal Neural Networks (FNN), a general field encompassing Parallel Distributed Processing (PDP), Connectionism, and Neural Nets. Intuitive understanding of notions such as stochasticity and determinism, and stable vs. unstable equilibrium are developed using computer programs. Computer simulation of FNN systems uses a general structured programming approach for dynamical systems.

9:00 - 9:30

**Role of Sensitivity Analysis and Attention in Connectionist Modeling**

Walter Schneider, University of Pittsburgh

Once you have a range of connectionist models, it is important to determine the robustness of the models to variations of the parameters. This can identify boundary conditions of the model, develop understanding of the mechanisms involved, and suggest new approaches to modeling and experiments. Tools and examples of such analysis are described.



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## Program Summary

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9:00-10:40	West A <i>Introduction to the Walter/Palya Experiment Controller and Its Networking Software</i>
9:30-10:10	West B <i>Computer-based Education</i>
9:30-10:30	Grand Ballroom A <i>Using 3-D Graphics in Psychological Research</i>
11:00-12:00	Grand Ballroom A <b>PRESIDENTIAL ADDRESS</b>
1:15-2:35	West A <i>Tools for Research in Perception and Cognition</i>
1:15-3:00	West B <i>Apple-Psych: A Pascal-based System for Real Time Experiments</i>
1:15-3:10	Grand Ballroom A <i>Applications of Microcomputers In Teaching</i>
3:15-5:00	West A <i>Desktop Experimental Laboratory: Eliminating Programming in Professional and Undergraduate Research</i>
3:15-3:55	West B <i>Microcomputer Programming Techniques</i>
3:45-4:45	Grand Ballroom A <i>Computer Use by Psychology Professionals</i>
4:05-4:45	West B <i>Modeling Complex Processes</i>
5:00-5:30	Grand Ballroom A <i>Members Meeting</i>
7:30-9:30	Grand Ballroom A <i>Tools and Techniques for Connectionist Modeling</i>

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