Research Presession

The 68th Annual Meeting of the National Council of Teachers of Mathematics

Monday, 16 April to Wednesday, 18 April 1990

Red Lion Hotel
Salt Lake City, Utah

Sponsored by
Research Advisory Committee of the National Council of Teachers of Mathematics
Special Interest Group for Research in Mathematics Education of the American Educational Research Association
NCTM RESEARCH ADVISORY COMMITTEE

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ANNOUNCEMENTS

Monday and Tuesday sessions are in the Canyon Rooms, Topaz Room, and Ballrooms of the Red Lion Hotel. Wednesday sessions are in the Salt Palace.

Informal gatherings may be held in Ballroom East. The room is available from 9:00 a.m. to 5:00 p.m. on Tuesday.

Provision of refreshments is gratefully acknowledged:
Dale Seymour Publications
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Notes:
(1) All organizers are reminded to allow a minimum of 15 minutes per session for general discussion.
(2) There may be a limit to the number participants allowed into worksessions. Check to see if there are sign-up sheets at the doors.

Monday, 16 April 1990

7:15-7:30 p.m. WELCOME
Red Lion Ballroom

Joan Ferrini-Mundy, University of New Hampshire Chair, NCTM Research Advisory Committee

Judith Sowder, San Diego State University Co-chair, AERA Special Interest Group for Research in Mathematics Education

7:30-9:00 p.m. MONITORING THE EFFECTS OF THE STANDARDS
Red Lion Ballroom

Speaker
Harold L. Schoen, University of Iowa

At the request of the NCTM Research Advisory Committee, the NCTM Board of Directors established a Task Force on Monitoring the Effects of the Standards, with Jane Gawronski, Andy Porter, and Hal Schoen (chair) as members. This presentation will focus on aspects of the Task Force's Final Report, particularly of the program for research and development needed to monitor the effects of the Standards.

Discussants
Raymond J. Hannapel, National Science Foundation
John A. Dossey, Illinois State University

9:00 - 10:00 p.m. CASH BAR
Grand Ballroom
## OVERVIEW (Tuesday)

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Special session at 5:00 in Topaz Room: Discussion with Program Officers of Federal Funding Agencies.

### Tuesday, 17 April 1990

#### 8:15-8:45 a.m.

**Coffee and Tea**  
Foyer

#### 8:45-9:00 a.m.

**Announcements**  
Ballroom East

#### 9:00-10:30 a.m.

**COMPUTER ENVIRONMENTS FOR LEARNING GEOMETRY**  
Topaz

- **Organizers and Presenters**  
  - Douglas H. Clements, SUNY at Buffalo
  - Michael T. Battista, Kent State University

- **Discussants**  
  - Sharon Senk, University of Chicago
  - Grayson Wheatley, Florida State University

- **Thematic Presentation**  
  - Computer learning environments for geometry will be examined (Logo, graphic construction programs, and "intelligent" tutors). This examination will include a description, analysis of the psychological and pedagogical underpinnings, and research review for each environment.

#### 9:00-10:30 a.m.

**A SUMMATIVE STUDY OF SQUARE ONE TV**  
Canyon II

- **Organizer and Presenter**  
  - Edward Esty, Children's Television Workshop

- **Presenter**  
  - Eve Hall, Children's Television Workshop

- **Discussant**  
  - Thomas A. Romberg, University of Wisconsin

- **Thematic Presentation**  
  - We will describe a major summative study of the first two seasons of Square One TV and relate aspects of the underlying methodology and philosophy to parts of the NCTM's Standards.
9:00-10:30 a.m.  TECHNOLOGY-INTENSIVE CURRICULA: RESEARCH ISSUES AND RESEARCH METHODS

Ballroom West

Organizer and Presenter  M. Kathleen Heid, Pennsylvania State University

Presenters  John Harvey, University of Wisconsin-Madison
            Thomas Dick, University of Oregon
            Daniel Chazan, Educational Development Center

Discussant  Mary Grace Kantowski, University of Florida

Symposium  Presenters will discuss methodology and issues particularly relevant to research centered on technology-intensive curricula. What are the new research questions related to the curricular use of technology? How well and in what ways do present research methodologies help answer these questions?

9:00-10:30 a.m.  ANALYSIS OF INTERVIEW DATA: THREE APPROACHES  Canyon I

Organizer and Presenter  Robert Underhill, Virginia Tech

Presider  Catherine Brown, Virginia Tech

Presenters  Doug Jones, Virginia Tech/University of Georgia
            Pat Agard, Virginia Tech

Discussant  Joe Harding, University of Colorado at Boulder

Symposium  Three methods will be presented: (1) a multi-stepped approach proposed by Spradley (1980); (2) the repertory grid technique developed by Fransella and Bannister (1977), and (3) meaningful interpretation units by Mick (1989). The discussant will comment on the specific applications cited and on their general use.

10:45-12:15 p.m.  RESEARCH IN COMPUTATIONAL ESTIMATION -- A PERSPECTIVE FROM THREE COUNTRIES  Topaz Room

Organizer and Presenter  Robert Reys, University of Missouri-Columbia

Presenters  Barbara Reys, University of Missouri-Columbia
            Alfinio Flores, San Diego State University, and CIM Guanajuato, Mexico
            Nobuhiko Nohda, University of Tsukuba, Japan
            Shigeo Yoshikawa, Joetsu University, Japan

Discussants  Paul Trafton, National College of Education
            Richard Shumway, The Ohio State University

Symposium  This symposium will highlight three specific research studies in the United States, Japan, and Mexico. A general framework highlighting characteristics of good estimators in the United States will be presented. Significant results from the research studies in Japan and Mexico will be summarized and discussed.

10:45-12:15 p.m.  ASPECTS OF LEARNING IN THE CALCULUS: A LOOK AT RECENT RESEARCH AND WHAT LIES AHEAD  Canyon II

Organizers and Presenters  F. Alexander Norman and Mary Kim Prichard
                            University of North Carolina at Charlotte

Presenters  Joan Ferrini-Mundy, University of New Hampshire
            Karen Graham, University of New Hampshire
            Robert B. Davis, Rutgers University

Discussant  Gerald Goldin, Rutgers University

Symposium  This session presents several distinctly different facets of current research in calculus learning, aspects of teaching, and application to the calculus curriculum.
10:45-12:15 p.m. COOPERATIVE LEARNING RESEARCH IN MATHEMATICS
Organizer and Presenter
Neil Davidson, University of Maryland
Discussants
Roberta Dees, University of Illinois at Chicago
Diana Kroll, Indiana University
Thematic Presentation
Research in cooperative learning in mathematics, including an overview of experimental-control comparisons, process-product studies relating peer interaction and student achievement, descriptive studies of group problem solving, and numerous open research questions.

10:45-12:15 p.m. DEVELOPING A RESEARCH AGENDA DEVOTED TO MATHEMATICS LEARNING OF MINORITY STUDENTS
Organizer and Session Leader
Martin L. Johnson, University of Maryland
Session Leaders
Honi J. Bamberger, University of Maryland
William Tate, University of Maryland
Dorothy Walker, University of Maryland
Worksession
The session will be organized around three themes: current state of affairs; explanations for the current state of affairs; needed research. Each theme will be presented in a short talk and then the audience will be invited to interact. The session will be summarized and interest groups identified for further interaction.

1:30-3:00 p.m. LEARNING, TEACHING, AND ASSESSING RATIONAL NUMBER CONCEPTS: MULTIPLE RESEARCH PERSPECTIVES
Organizers and Presenters
Thomas P. Carpenter and Elizabeth Fennema
University of Wisconsin-Madison
Presenters
Deborah Ball, Michigan State University
Catherine Brown, Virginia Polytechnic Institute
Susan Lamon, Marquette University
Richard Lesh, Educational Testing Service
Nancy Mack, Northern Illinois University
Judith Sowder, San Diego State University
Symposium
Reported and discussed in this session will be the integration of research in rational numbers around six major strands: content analysis, student thinking, teacher thinking, classroom instruction, assessment, and curricular implications.

1:30-3:00 p.m. TEACHERS AS CURRICULUM DEVELOPERS: RESEARCH ISSUES RELATED TO HOW AND WHY
Organizer and Session Leader
Patricia S. Wilson, University of Georgia
Session Leaders
Joseph Zilliox, University of Georgia
Hilda Lavender, South Jackson Elementary School
Neil Pateman, University of Georgia and University of Hawaii
Worksession
Based on an NSF elementary school geometry and measurement curriculum project, a panel will raise issues related to effective teacher involvement in curriculum development. We will discuss necessary teacher knowledge, effective teacher support, and documentation of teacher contributions.
10:45-12:15 p.m. COOPERATIVE LEARNING RESEARCH IN MATHEMATICS  
Ballroom West

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1:30-4:45 p.m. INTEGRATING RESEARCH ON GRAPHICAL REPRESENTATION OF FUNCTIONS

Organizers
Thomas Romberg and Randolph Philipp
University of Wisconsin-Madison

Presenters
Thomas Cooney, University of Georgia
Robert Davis, Rutgers University
Frank Demana, The Ohio State University
Sharon Dugdale, University of Illinois
John Harvey, University of Wisconsin-Madison
James Kaput, Southeastern Massachusetts University
Harold Schoen, University of Iowa
Judah Schwartz, Harvard/MIT
Sharon Senk, University of Chicago
Bert Waits, The Ohio State University
Steve Williams, Washington State University

Symposium
Reported and discussed in this session will be the integration of research on graphical representation of functions around six major strands: content analysis, student thinking, teacher thinking, classroom instruction, assessment, and curricular implications.

1:30-3:00 p.m. VYGOTSKIAN PERSPECTIVES IN MATHEMATICS EDUCATION

Organizer and Session Leader
Lyn Taylor, University of Denver at Colorado

Session Leaders
Sidney L. Rachlin, University of Hawaii
Carol Thornton, Illinois State University

Worksession
Work-session leaders will first give brief presentations concerning Vygotsky's influence on their work. Topics will include math attitudes, the zone of proximal development, algebra learning, and early language development. Worksession participants will discuss the educational implications and their work and thoughts.

3:15-4:45 p.m. THE R IN CURRICULUM R & D

Organizer and Presenter
Sidney L. Rachlin, University of Hawaii

Presenters
Hannah Slovin, University of Hawaii
Barbara Dougherty, University of Hawaii

Reactor
W. Gary Martin, University of Hawaii

Symposium
The symposium explores the role of research in curriculum design, development, dissemination, and implementation. Specific examples from the Hawaii Algebra Learning Project illustrate the integration of research on learning and teaching to form a new field of inquiry - curriculum research.

3:15-4:45 p.m. MATHEMATICAL ABILITIES OF NON-MATHEMATICS MAJORS: WHAT COLLEGE STUDENTS CAN AND CANNOT DO

Organizer and Presenter
Suzanne Chapin, Boston University

Presenters
Donna Christy, Rhode Island College
Carol Findell, Boston University
Carole Greenes, Boston University

Symposium
Data collected from four major studies of college students' computational, linguistic, and problem solving abilities will be presented. Discussion will focus on assessment techniques and possible interventions.

5:00-6:00 p.m. DISCUSSION WITH PROGRAM OFFICERS OF FEDERAL FUNDING AGENCIES

Speakers
Glenda Lappan, Teacher Preparation, NSF
Joan Ferrini-Mundy, Teacher Enhancement, NSF
Thomas Berger, Materials Development, NSF
Ray Hannapel, Research, Teaching & Learning, NSF
Steven Kirsner, OERI

A discussion of funding opportunities in federal programs, an opportunity for the mathematics education research community to suggest directions for programs, and the chance to raise questions and concerns.

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Wednesday, 18 April 1990

8:30-10:00 a.m.  FAMILIES IN FAMILY MATH: A STUDY OF PARENTS' ROLES IN THEIR CHILDREN'S MATH LEARNING (Joint Session with NCSM)  
Little Theatre (SP)  
Presider  Joella Gipson, Wayne State University  
Speaker  Kathryn D. Sloane, Lawrence Hall of Science University of California, Berkeley  

10:30-1:30 p.m.  TEACHERS' STUDY OF EXEMPLARY SCHOOL MATHEMATICS PRACTICE: NECESSARY AND COMMON BY 2000 (Workshop)  
Presider  Jane O. Swafford, Illinois State University  
Speaker  Perry Lanier, Michigan State University  

Note: The Wednesday sessions are part of NCTM's annual meeting. The workshop requires admission by ticket.