

Research Preession

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*

Monday, 16 April 1990

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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.

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*

Tuesday, 17 April 1990

OVERVIEW
(Tuesday)

	9:00 - 10:30	10:45 - 12:15	1:30 - 3:00	3:15 - 4:45
<i>Topaz Room</i>	Computer Environments for Learning Geometry	Research in Computational Estimation -- A Perspective from Three Countries	Learning, Teaching, and Assessing Rational Number Concepts: Multiple Research Perspectives	
<i>Canyon II</i>	A Summative Study of <i>Square One TV</i>	Aspects of Learning in the Calculus: A Look at Recent Research and What Lies Ahead	Teachers as Curriculum Developers: Research Issues Related to How and Why	The R in Curriculum R & D
<i>Ballroom West</i>	Technology-Intensive Curricula: Research Issues and Research Methods	Cooperative Learning Research in Mathematics	Integrating Research on Graphical Representation of Functions	
<i>Canyon I</i>	Analysis of Interview Data: Three Approaches	Developing a Research Agenda Devoted to Mathematics Learning of Minority Students	Vygotskian Perspectives in Mathematics Education	Mathematical Abilities of Non-Mathematics Majors: What College Students Can and Cannot Do

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

8:15-8:45 a.m.	Coffee and Tea	<i>Foyer</i>
8:45-9:00 a.m.	Announcements	<i>Ballroom East</i>

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** *Ballroom West*

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** *Canyon I*

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** *Topaz Room*

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** *Canyon II*

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.*

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1:30-4:45 p.m.	INTEGRATING RESEARCH ON GRAPHICAL REPRESENTATION OF FUNCTIONS	Ballroom West
Organizers	Thomas Romberg and Randolph Philipp <i>University of Wisconsin-Madison</i>	
Presenters	Thomas Cooney, <i>University of Georgia</i> Robert Davis, <i>Rutgers University</i> Frank Demana, <i>The Ohio State University</i> Sharon Dugdale, <i>University of Illinois</i> John Harvey, <i>University of Wisconsin-Madison</i> James Kaput, <i>Southeastern Massachusetts University</i> Harold Schoen, <i>University of Iowa</i> Judah Schwartz, <i>Harvard/MIT</i> Sharon Senk, <i>University of Chicago</i> Bert Waits, <i>The Ohio State University</i> Steve Williams, <i>Washington State University</i>	
Symposium	<i>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.</i>	

1:30-3:00 p.m.	VYGOTSKIAN PERSPECTIVES IN MATHEMATICS EDUCATION	Canyon I
Organizer and Session Leader	Lyn Taylor, <i>University of Denver at Colorado</i>	
Session Leaders	Sidney L. Rachlin, <i>University of Hawaii</i> Carol Thornton, <i>Illinois State University</i>	
Worksession	<i>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.</i>	

3:15-4:45 p.m.	THE R IN CURRICULUM R & D	Canyon II
Organizer and Presenter	Sidney L. Rachlin, <i>University of Hawaii</i>	
Presenters	Hannah Slovin, <i>University of Hawaii</i> Barbara Dougherty, <i>University of Hawaii</i>	
Reactor	W. Gary Martin, <i>University of Hawaii</i>	
Symposium	<i>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.</i>	

3:15-4:45 p.m.	MATHEMATICAL ABILITIES OF NON-MATHEMATICS MAJORS: WHAT COLLEGE STUDENTS CAN AND CANNOT DO	Canyon I
Organizer and Presenter	Suzanne Chapin, <i>Boston University</i>	
Presenters	Donna Christy, <i>Rhode Island College</i> Carol Findell, <i>Boston University</i> Carole Greenes, <i>Boston University</i>	
Symposium	<i>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.</i>	

5:00-6:00 p.m.	DISCUSSION WITH PROGRAM OFFICERS OF FEDERAL FUNDING AGENCIES	Topaz Room
Speakers	Glenda Lappan, <i>Teacher Preparation, NSF</i> Joan Ferrini-Mundy, <i>Teacher Enhancement, NSF</i> Thomas Berger, <i>Materials Development, NSF</i> Ray Hannapel, <i>Research, Teaching & Learning, NSF</i> Steven Kirsner, <i>OERI</i>	
	<i>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.</i>	

Wednesday, 18 April 1990

8:30-10:00 a.m. **FAMILIES IN FAMILY MATH: A** *Little*
STUDY OF PARENTS' ROLES *Theatre (SP)*
IN THEIR CHILDREN'S MATH LEARNING
(Joint Session with NCSM)

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** *A 119 (SP)*
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.