

Contents

Preface	vii
<i>Jinfa Cai</i>	
Acknowledgments	xi
<i>Jinfa Cai</i>	
SECTION 1. FOUNDATIONS	
1 Research: To Inform, Deform, or Reform?	3
<i>Jere Confrey</i>	
2 Linking Research and Practice in Mathematics Education: Perspectives and Pathways	28
<i>Edward A. Silver and Crystal Lunsford</i>	
3 Education Reform, Research, and Policy: Interwoven Influences on Mathematics Education in the United States	48
<i>Joan Ferrini-Mundy</i>	
4 A Taxonomy of Approaches to Learning Trajectories and Progressions	74
<i>Joanne Lobato and C. David Walters</i>	
5 The Role of Theory Development in Increasing the Subject Specificity of Research on Mathematics Teaching	102
<i>Patricio Herbst and Daniel Chazan</i>	
6 Exploring Different Theoretical Frontiers for Different (and Uncertain) Possibilities in Mathematics Education Research	128
<i>David W. Stinson and Margaret Walshaw</i>	
SECTION 2. METHODS	
7 Qualitative Methods	159
<i>Elizabeth de Freitas, Stephen Lerman, and Amy Noelle Parks</i>	
8 Aligning Statistical Modeling With Theories of Learning in Mathematics Education Research	183
<i>Finbarr C. Sloane and Jesse L. M. Wilkins</i>	
9 Conducting Design Studies to Investigate and Support Mathematics Students' and Teachers' Learning	208
<i>Paul Cobb, Kara Jackson, and Charlotte Dunlap Sharpe</i>	

SECTION 3. MATHEMATICAL PROCESSES AND CONTENT

10	Research on the Teaching and Learning of Proof: Taking Stock and Moving Forward	237
	<i>Gabriel J. Stylianides, Andreas J. Stylianides, and Keith Weber</i>	
11	The Teaching and Learning of Mathematical Modeling	267
	<i>Gabriele Kaiser</i>	
12	Providing Support for Student Learning: Recommendations from Cognitive Science for the Teaching of Mathematics	292
	<i>Jon R. Star and Lieven Verschaffel</i>	
13	Early Number and Operations: Whole Numbers	308
	<i>Arthur J. Baroody with David J. Purpura</i>	
14	Learning and Teaching Measurement: Coordinating Quantity and Number	355
	<i>John P. Smith III and Jeffrey E. Barrett</i>	
15	Algebraic Thinking in the Elementary and Middle Grades	386
	<i>Ana C. Stephens, Amy B. Ellis, Maria Blanton, and Bárbara M. Brizuela</i>	
16	Variation, Covariation, and Functions: Foundational Ways of Thinking Mathematically	421
	<i>Patrick W. Thompson and Marilyn P. Carlson</i>	
17	The Learning and Teaching of Geometry	457
	<i>Nathalie Sinclair, Michelle Cirillo, and Michael de Villiers</i>	
18	Teaching and Learning Probability and Statistics: An Integrated Perspective	490
	<i>Cynthia W. Langrall, Katie Makar, Per Nilsson, and J. Michael Shaughnessy</i>	
19	Understanding the Concepts of Calculus: Frameworks and Roadmaps Emerging From Educational Research	526
	<i>Sean Larsen, Karen Marrongelle, David Bressoud, and Karen Graham</i>	
20	Post-Calculus Research in Undergraduate Mathematics Education	551
	<i>Chris Rasmussen and Megan Wawro</i>	

SECTION 4. STUDENTS, TEACHERS, AND LEARNING ENVIRONMENTS

21	Language Diversity and Mathematics: Second Language, Bilingual, and Multilingual Learners	583
	<i>Richard Barwell, Judit N. Moschkovich, and Mamokgethi Setati Phakeng</i>	
22	Race and Mathematics Education	607
	<i>Danny Bernard Martin, Celia Rousseau Anderson, and Niral Shah</i>	
23	Identity in Research on Mathematics Education	637
	<i>Jennifer M. Langer-Osuna and Indigo Esmonde</i>	
24	Research on Gender and Mathematics	649
	<i>Sarah Theule Lubinski and Colleen M. Ganley</i>	
25	The Complexities of Mathematical Engagement: Motivation, Affect, and Social Interactions	667
	<i>James Middleton, Amanda Jansen, and Gerald A. Goldin</i>	

26	The Multimodal Material Mind: Embodiment in Mathematics Education	700
	<i>Luis Radford, Ferdinando Arzarello, Laurie Edwards, and Cristina Sabena</i>	
27	Highlighting Heritages and Building Tasks: A Critical Analysis of Mathematics Classroom Discourse Literature	722
	<i>Beth Herbel-Eisenmann, Tamsin Meaney, Jessica Pierson Bishop, and Einat Heyd-Metzuyanim</i>	
28	Research on Core Practices in K–12 Mathematics Teaching	766
	<i>Victoria R. Jacobs and Denise A. Spangler</i>	
29	Research on Mathematics Professional Development	793
	<i>Paola Sztajn, Hilda Borko, and Thomas M. Smith</i>	
30	Issues in Curriculum Studies: Evidence-Based Insights and Future Directions	824
	<i>Gwendolyn M. Lloyd, Jinfa Cai, and James E. Tarr</i>	
31	Technology for Learning Mathematics	853
	<i>Jeremy Roschelle, Richard Noss, Paulo Blikstein, and Nicholas Jackiw</i>	
SECTION 5. FUTURISTIC ISSUES		
32	Mathematics Educational Neuroscience: Promises and Challenges	879
	<i>Anderson Norton and Martha Ann Bell</i>	
33	Instruction That Meets the Needs of Students With Mathematics Disabilities and Difficulties	893
	<i>Anne Foegen and Barbara Dougherty</i>	
34	Creativity and Giftedness in Mathematics Education: A Pragmatic View	908
	<i>Bharath Sriraman and Per Haavold</i>	
35	Assessment in the Era of Teacher Accountability	917
	<i>Peter Kloosterman and Hugh Burkhardt</i>	
36	Doctorates in Mathematics Education: How They Have Evolved, What Constitutes a High-Quality Program, and What Might Lie Ahead	934
	<i>Robert E. Reys</i>	
37	Mathematics Education at U.S. Public Two-Year Colleges	949
	<i>Vilma Mesa</i>	
38	Toward a Vibrant and Socially Significant Informal Mathematics Education	968
	<i>Ricardo Nemirovsky, Molly L. Kelton, and Marta Civil</i>	
INDEX		981