CONTENTS

Preface	v
Series Foreword	
Judith Threadgill Sowder	Vii
Introduction: Capturing the Major Themes James Hiebert & Merlyn Behr	1
Part 1: Analyses of Subject Matter	
Multiplicative School Word Problems: Theoretical Approaches and Empirical Findings Pearla Nesher	19
Intensive Quantity and Referent Transforming Arithmetic Operations Judah L. Schwartz	41
Mathematical Meaning and Applicational Meaning in the Semantics of Fractions and Related Concepts Stellan Ohlsson	53
Proportional Reasoning Richard Lesh, Thomas Post, & Merlyn Behr	93
Part II: Theoretical Analyses of Emerging Competence	
Children's Construction of Number Sequences and Multiplying Schemes Leslie P. Steffe	119
Multiplicative Structures Gérard Vergnaud	141
Personal Knowledge of Rational Numbers: Its Intuitive and Formal Development	
Thomas E. Kieren	162
Part III: Effects of Conventional and Experimental Instruction	
Mental Computation and Number Comparison: Their Roles in the Development of Number Sense and Computational Estimation Judith Threadgill Sowder	182
Ratio and Proportion Kathleen Hart	198
Constructing and Using Meaning for Mathematical Symbols: The Case of Decimal Fractions Diana Wearne & James Hiebert	220
THE TAX OF THE PARTY OF THE PAR	440

A Developmental Approach to the Identification and Teaching of	
Central Conceptual Structures in Mathematics and Science in the Middle Grades	
Robbie Case & Robert Sandieson	236
Summary Comments: Meaning in Middle Grade Number Concepts Karen Fuson	260
Summary Comments: Developing a Research Agenda for Mathematics in the Middle Grades	
Robbie Case	265
Participants	271