Contents

Preface xiii

Acknowledgments xv

GENERAL PERSPECTIVES ON CHILDREN'S THINKING

1 An Introduction to Children's Thinking 1

What Is Children's Thinking? 2

Key Issues About Children's Thinking 4

What capabilities are innate? 4

Does development progress through stages? 6

How does change occur? 8

How do individuals differ? 10

The Book's Organization 13

The chapter-by-chapter organization 13

The central themes 14

Summary 15

Recommended Readings 16

2 Piaget's Theory of Development 17
An Overview of Piaget's Theory 19
The theory as a whole 19
The stages of development 20
Developmental processes 21
Orienting assumptions 24
The Stage Model 26
The sensorimotor period 26
The preoperational period 30
The concrete operations period 34
The formal operations period 37
The Development of Some Critical Concepts 38
Conservation 39
Classes and relations 41
An Evaluation of Piaget's Theory 47
How accurately does the theory describe particular aspects of children's thinking? 47
How stagelike is children's thinking? 49
How well do Piaget's general characterizations fit children's thinking? 53
The current status of Piaget's theory 54
Summary 55
Recommended Readings 57

3 Information-Processing Theories of Development 58
An Overview of the Information-Processing System 62
Structural characteristics 62
Processes 64
Information-Processing Theories of Development 66
Sternberg's theory 67
Case's theory 73
Klahr and Wallace's theory 78
Siegler's theory 82
Summary 88
Recommended Readings 89

SIX SPECIFIC ASPECTS OF CHILDREN'S THINKING

4 Perceptual Development 91
Vision 94
Attending to visual patterns 96

Identifying objects and events 102
Locating objects 111
Hearing 117
Attending to sounds 117
Identifying sounds 118
Auditory localization 122
Intersensory Integration 124
Attending 124
Identifying 125
Locating 125
Summary 130
Recommended Readings 131

5 Language Development 133
Phonology 138
How people speak 138
Development of phonology 139
Meaning 142
Early words and word meanings 142
Development beyond the earliest words and word meanings 146
Grammar 152
The earliest grammars 152
Later grammatical development 153
Explanations of grammatical development 155
Communication 158
Communication through oral language 159
Communication through gesture and sign language 160
Language and Thought 163
Summary 166
Recommended Readings 167

6 Memory Development 169
What Develops in Memory Development? 173
The Role of Basic Capacities 175
Recognition 175
Association, recall, and generalization 176
Infantile amnesia 177
Processing capacity 179
Processing speed 180
Evaluation 181

The Role of Strategies 181
Searching for objects 182
Rehearsing 183
Organizing 185
Elaborating 186
Deploying cognitive resources 187
Evaluation 189
The Role of Metacognition 190
Explicit metacognitive knowledge 190
Implicit metacognitive knowledge 191
Evaluation 193
The Role of Content Knowledge 195
Effects on how much children remember 195
Effects on what children remember 196
Content knowledge as an explanation for other memory changes 199
How does content knowledge aid memory? 200
Evaluation 205
What Develops When in Memory Development? 205
Summary 207
Recommended Readings 209

7 Conceptual Development 210
Conceptual Representations in General 213
Defining-features representations 213
Probabilistic representations 217
Exemplar-based representations 223
Theory-based representations 225
Development of Some Particularly Important Concepts 231
Time 231
Space 234
Number 240
Mind 244
Summary 248
Recommended Readings 250

8 Problem Solving 251
An Overview of Problem Solving 253
Central themes 253
An example of the development of problem solving 257
Some Important Problem-Solving Processes 266
Planning 266

Causal inference 270
Analogy 274
Tool use 276
Logical deduction 279
Summary 285
Recommended Readings 287

9 Development of Academic Skills 288
Mathematics 290
Basic arithmetic 293
More-complex arithmetic 301
Estimation 305
Algebra 306
Computer programming 308
Reading 309
The typical chronological progression 309
Prereading skills 310
Identifying individual words 313
Comprehension 316
Writing 322
The initial drafting process 323
Revision 327
Summary 329
Recommended Readings 330

10 Conclusions for the Present; Challenges for the Future 332
The Most Basic Issues: What Develops and How Does Development Occur? 333
Current knowledge 334
Future issues 335
Processes of Change 336
Current knowledge 336
Future issues 338
The Competent Infant 342
Current knowledge 342
Future issues 343
Differences Among Age Groups 349
Current knowledge 349
Future issues 350

The Role of Content Knowledge 352
Current knowledge 352
Future issues 353
Intelligence and the Deployment of Processing Resources 354
Current knowledge 354
Future issues 355
The Social Context of Children's Thinking 359
Current knowledge 360
Future issues 361
Summary 370
Recommended Readings 372

References 373

Author Index 409

Subject Index 421