FOURTH EDITION

How Children DEVELOP

Robert Siegler Judy DeLoache Nancy Eisenberg Jenny Saffran

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brief contents:

	Preface	xx
1	An Introduction to Child Development	1
2	Prenatal Development and the Newborn Period	39
3	Biology and Behavior	85
4	Theories of Cognitive Development	129
5	Seeing, Thinking, and Doing in Infancy	171
6	Development of Language and Symbol Use	215
7	Conceptual Development	259
8	Intelligence and Academic Achievement	297
9	Theories of Social Development	339
10	Emotional Development	383
11	Attachment to Others and Development of Self	425
12	The Family	467
13	Peer Relationships	509
14	Moral Development	553
15	Gender Development	593
16	Conclusions	637
	Glossary	G-1
	References	R-1
	Name Index	NI-1
	Subject Index	SI-1

contents:

Preface xx

Chapter 1 An Introduction to Child Development 1

Reasons to Learn About Child Development 3

Raising Children 3
Choosing Social Policies 4
Understanding Human Nature 6
Review 7

Historical Foundations of the Study of Child Development 7

Early Philosophers' Views of Children's Development 8
Social Reform Movements 9
Darwin's Theory of Evolution 9
The Beginnings of Research-Based Theories of Child Development 10
Review 10

Enduring Themes in Child Development 10

1. *Nature and Nurture:* How Do Nature and Nurture Together Shape Development? 10
2. *The Active Child:* How Do Children Shape Their Own Development? 12
3. *Continuity/Discontinuity:* In What Ways Is Development Continuous, and in What Ways Is It Discontinuous? 13
4. *Mechanisms of Development:* How Does Change Occur? 16
5. *The Sociocultural Context:* How Does the Sociocultural Context Influence Development? 17
6. *Individual Differences:* How Do Children Become So Different from One Another? 20
7. *Research and Children's Welfare:* How Can Research Promote Children's Well-Being? 21

Review 22

Methods for Studying Child Development 22

The Scientific Method 23
Contexts for Gathering Data About Children 25
Correlation and Causation 28
Designs for Examining Development 32
Ethical Issues in Child-Development Research 35
Review 36

Chapter 2 Prenatal Development and the Newborn Period 39

Prenatal Development 41

Box 2.1: A Closer Look Beng Beginnings 41
Conception 42
Box 2.2: Individual Differences The First—and Last—Sex Differences 44
Developmental Processes 45
Box 2.3: A Closer Look Phylogenetic Continuity 46
Early Development 47
An Illustrated Summary of Prenatal Development 48
Fetal Behavior 51
Fetal Experience 52
Fetal Learning 54
Hazards to Prenatal Development 56
Box 2.4: Applications Face Up to Wake Up 61
Review 66

The Birth Experience 66

Diversity of Childbirth Practices 68
Review 69

The Newborn Infant 70

State of Arousal 70
Negative Outcomes at Birth 74
Box 2.5: Applications Parenting a Low-Birth-Weight Baby 78
Review 81

Chapter 3 Biology and Behavior 85

Nature and Nurture 87

Genetic and Environmental Forces 88
Box 3.1: Applications Genetic Transmission of Disorders 94
Behavior Genetics 99
Box 3.2: Individual Differences Identical Twins Reared Apart 101
Review 105

Brain Development 106

Structures of the Brain 106
Developmental Processes 109
Box 3.3: A Closer Look Mapping the Mind 110
The Importance of Experience 114
Brain Damage and Recovery 117
Review 118

The Body: Physical Growth and Development 119

Growth and Maturation 119

Nutritional Behavior 121
Review 126

Chapter 4 Theories of Cognitive Development 129

Piaget's Theory 132
View of Children's Nature 132
Central Developmental Issues 133
The Sensorimotor Stage (Birth to Age 2 Years) 135
The Preoperational Stage (Ages 2 to 7) 138
The Concrete Operational Stage (Ages 7 to 12) 141
The Formal Operational Stage (Age 12 and Beyond) 141
Piaget's Legacy 142
Box 4.1: Applications Educational Applications of Piaget's Theory 143
Review 144

Information-Processing Theories 145
View of Children's Nature 146
Central Developmental Issues 147
Box 4.2: Applications Educational Applications of Information-Processing Theories 154
Review 155

Sociocultural Theories 155
View of Children's Nature 156
Central Developmental Issues 158
Review 160
Box 4.3: Applications Educational Applications of Sociocultural Theories 161

Dynamic-Systems Theories 161
View of Children's Nature 163
Central Development Issues 165
Box 4.4: Applications Educational Applications of Dynamic-Systems Theories 166
Review 167

Chapter 5 Seeing, Thinking, and Doing in Infancy 171

Perception 173
Vision 173
Box 5.1: A Closer Look Infants' Face Perception 176
Box 5.2: A Closer Look Picture Perception 183
Auditory Perception 182
Taste and Smell 186
Touch 186
Intermodal Perception 186
Review 188

Motor Development 188
Reflexes 189
Motor Milestones 190
Current Views of Motor Development 191
Box 5.3: A Closer Look "The Case of the Disappearing Reflex" 192
The Expanding World of the Infant 192
Box 5.4: Applications A Recent Secular Change in Motor Development 195
Box 5.5: A Closer Look "Gangway—I'm Coming Down" 196
Review 198

Learning 198
Habituation 199
Perceptual Learning 199
Statistical Learning 200
Classical Conditioning 201
Instrumental Conditioning 201
Observational Learning/Imitation 202
Rational Learning 204
Review 205

Cognition 205
Object Knowledge 206
Physical Knowledge 207
Social Knowledge 208
Looking Ahead 211
Review 211

Chapter 6 Development of Language and Symbol Use 215

Language Development 216
The Components of Language 217
What Is Required for Language? 218
Box 6.1: Applications Two Languages Are Better Than One 222
The Process of Language Acquisition 224
Box 6.2: Individual Differences The Role of Family and School Context in Early Language Development 235
Box 6.3: Applications: iBabies: Technology and Language Learning 240
Theoretical Issues in Language Development 246
Box 6.4: A Closer Look: "I Just Can't Talk Without My Hands" What Gestures Tell Us About Language 248
Box 6.5: Individual Differences Developmental Language Disorders 251
Review 252

Nonlinguistic Symbols and Development 252
Using Symbols as Information 253
Drawing 254
Review 256

Chapter 7 Conceptual Development 259

Understanding Who or What 261

Dividing Objects into Categories 261
Knowledge of Other People and Oneself 266
Box 7.1: Individual Differences Children with Autism Spectrum Disorders (ASD) 270
Box 7.2: Individual Differences Imaginary Companions 273
Knowledge of Living Things 273
Review 278

Understanding Why, Where, When, and How Many 278

Causality 279
Box 7.3: A Closer Look Magical Thinking and Fantasy 282
Space 283
Time 286
Number 288
Relations Among Understanding of Space, Time, and Number 292
Review 293

Chapter 8 Intelligence and Academic Achievement . . . 297

What Is Intelligence? 299

Intelligence as a Single Trait 299
Intelligence as a Few Basic Abilities 299
Intelligence as Numerous Processes 300
A Proposed Resolution 300
Review 301

Measuring Intelligence 301

The Contents of Intelligence Tests 302
The Intelligence Quotient (IQ) 304
Continuity of IQ Scores 305
Box 8.1: Individual Differences Gifted Children 306
Review 306

IQ Scores as Predictors of Important Outcomes 307

Review 308

Genes, Environment, and the Development of Intelligence 308

Qualities of the Child 309
Influence of the Immediate Environment 310
Influence of Society 313
Box 8.2: Applications: A Highly Successful Early Intervention: The Carolina Abecedarian Project 318
Review 320

Alternative Perspectives on Intelligence 320

Review 322

Acquisition of Academic Skills: Reading, Writing, and Mathematics 322
Reading 322
Box 8.3: Individual Differences Dyslexia 326
Writing 328
Mathematics 330
Mathematics Anxiety 334
Box 8.4: Applications Mathematics Disabilities 335
Review 335

Chapter 9 Theories of Social Development 339

Psychoanalytic Theories 341
View of Children's Nature 342
Central Developmental Issues 342
Freud's Theory of Psychosexual Development 342
Erikson's Theory of Psychosocial Development 345
Current Perspectives 347
Review 348

Learning Theories 348
View of Children's Nature 349
Central Developmental Issues 349
Watson's Behaviorism 349
Skinner's Operant Conditioning 350
Social Learning Theory 352
Box 9.1: A Closer Look Bandura and Bobo 352
Current Perspectives 355
Review 356

Theories of Social Cognition 356
View of Children's Nature 356
Central Developmental Issues 356
Selman's Stage Theory of Role Taking 357
Dodge's Information-Processing Theory of Social Problem Solving 357
Dweck's Theory of Self-Attributions and Achievement Motivation 359
Current Perspectives 361
Review 361

Ecological Theories of Development 362
View of Children's Nature 362
Central Developmental Issues 362
Ethological and Evolutionary Theories 362
The Bioecological Model 366
Box 9.2: Individual Differences Attention-Deficit Hyperactivity Disorder 370
Box 9.3: Applications Preventing Child Abuse 373
Current Perspectives 378
Review 379

Chapter 10 Emotional Development 383

The Development of Emotions in Childhood 385

Theories on the Nature and Emergence of Emotion 386

The Emergence of Emotion in the Early Years and Childhood 387

Box 10.1: Individual Differences Gender Differences in Adolescent Depression 396

Review 398

Regulation of Emotion 398

The Development of Emotional Regulation 399

The Relation of Emotional Self-Regulation to Social Competence and Adjustment 401

Review 402

Individual Differences in Emotion and Its Regulation 402

Temperament 403

Box 10.2: A Closer Look Measurement of Temperament 406

Review 410

Children's Emotional Development in the Family 410

Quality of the Child's Relationships with Parents 410

Parental Socialization of Children's Emotional Responding 411

Review 414

Culture and Children's Emotional Development 414

Review 416

Children's Understanding of Emotion 416

Identifying the Emotions of Others 416

Understanding the Causes and Dynamics of Emotion 418

Children's Understanding of Real and False Emotions 419

Review 421

Chapter 11 Attachment to Others and Development of Self 425

The Caregiver–Child Attachment Relationship 427

Attachment Theory 428

Measurement of Attachment Security in Infancy 430

Box 11.1: Individual Differences Parental Attachment Status 432

Cultural Variations in Attachment 434

Factors Associated with the Security of Children's Attachment 435

Box 11.2: Applications Interventions and Attachment 436

Does Security of Attachment Have Long-Term Effects? 437

Review 439

Conceptions of the Self 439

The Development of Conceptions of Self 440

Identity in Adolescence 446
Review 449

Ethnic Identity 449
Ethnic Identity in Childhood 450
Ethnic Identity in Adolescence 451
Review 453

Sexual Identity or Orientation 453
The Origins of Youths' Sexual Identity 453
Sexual Identity in Sexual-Minority Youth 454
Review 458

Self-Esteem 458
Sources of Self-Esteem 459
Self-Esteem in Minority Children 462
Culture and Self-Esteem 463
Review 464

Chapter 12 The Family 467

Family Dynamics 470
Box 12.1: A Closer Look Parent–Child Relationships in Adolescence 471
Review 472

The Role of Parental Socialization 472
Parenting Styles and Practices 472
The Child as an Influence on Parenting 477
Socioeconomic Influences on Parenting 479
Box 12.2: A Closer Look Homelessness 481
Review 482

Mothers, Fathers, and Siblings 482
Differences in Mothers' and Fathers' Interactions with Their Children 482
Sibling Relationships 483
Review 485

Changes in Families in the United States 485
Box 12.3: Individual Differences Adolescents as Parents 486
Older Parents 488
Divorce 489
Stepparenting 494
Lesbian and Gay Parents 496
Review 497

Maternal Employment and Child Care 498
The Effects of Maternal Employment 498
The Effects of Child Care 500
Review 506

Chapter 13 Peer Relationships 509

What Is Special About Peer Relationships? 512

Friendships 513

Early Peer Interactions and Friendships 513

Developmental Changes in Friendship 515

The Functions of Friendships 517

Effects of Friendships on Psychological Functioning and Behavior over Time 520

Box 13.1: Individual Differences Culture and Children's Peer Experience 522

Children's Choice of Friends 523

Review 525

Peers in Groups 525

The Nature of Young Children's Groups 525

Cliques and Social Networks in Middle Childhood and Early Adolescence 526

Cliques and Social Networks in Adolescence 526

Negative Influences of Cliques and Social Networks 528

Box 13.2: A Closer Look Cyberspace and Children's Peer Experience 529

Romantic Relationships with Peers 531

Review 532

Status in the Peer Group 532

Measurement of Peer Status 533

Characteristics Associated with Sociometric Status 533

Box 13.3: Applications Fostering Children's Peer Acceptance 538

Stability of Sociometric Status 539

Cross-Cultural Similarities and Differences in Factors Related to Peer Status 539

Peer Status as a Predictor of Risk 540

Review 543

The Role of Parents in Children's Peer Relationships 544

Relations Between Attachment and Competence with Peers 544

Quality of Ongoing Parent–Child Interactions and Peer Relationships 545

Parental Beliefs 546

Gatekeeping and Coaching 546

Family Stress and Children's Social Competence 548

Review 548

Chapter 14 Moral Development 553

Moral Judgment 555

Piaget's Theory of Moral Judgment 555

Kohlberg's Theory of Moral Judgment 558

Prosocial Moral Judgment 562
Domains of Social Judgment 563
Review 566

The Early Development of Conscience 566
Factors Affecting the Development of Conscience 567
Review 568

Prosocial Behavior 568
The Development of Prosocial Behavior 569
The Origins of Individual Differences in Prosocial Behavior 571
Box 14.1: A Closer Look Cultural Contributions to Children's Prosocial and Antisocial Tendencies 573
Box 14.2: Applications School-Based Interventions for Promoting Prosocial Behavior 576
Review 577

Antisocial Behavior 577
The Development of Aggression and Other Antisocial Behaviors 577
Consistency of Aggressive and Antisocial Behavior 579
Box 14.3: A Closer Look Oppositional Defiant Disorder and Conduct Disorder 580
Characteristics of Aggressive-Antisocial Children and Adolescents 581
The Origins of Aggression 582
Biology and Socialization: Their Joint Influence on Children's Antisocial Behavior 587
Box 14.4: Applications The Fast Track Intervention 588
Review 589

Chapter 15 Gender Development 593

Theoretical Approaches to Gender Development 595
Biological Influences 596
Box 15.1: A Closer Look: Gender Identity: More than Socialization? 598
Cognitive and Motivational Influences 599
Box 15.2: A Closer Look Gender Typing at Home 604
Box 15.3: Applications Where Are SpongeSally SquarePants and Curious Jane? 605
Cultural Influences 606
Review 607

Milestones in Gender Development 607
Infancy and Toddlerhood 608
Preschool Years 608
Middle Childhood 610
Adolescence 612
Box 15.4: A Closer Look Gender Flexibility and Asymmetry 613
Review 614

Comparing Girls and Boys 614
Physical Growth: Prenatal Development Through Adolescence 617
Cognitive Abilities and Academic Achievement 619
Personality Traits 625
Interpersonal Goals and Communication 626
Box 15.5: A Closer Look Gender and Children's Communication Styles 627
Aggressive Behavior 628
Box 15.6: Applications Sexual Harassment and Dating Violence 631
Review 633

Chapter 16 Conclusions 637
Theme 1: Nature and Nurture: All Interactions, All the Time 638
Nature and Nurture Begin Interacting Before Birth 638
Infants' Nature Elicits Nurture 639
Timing Matters 639
Nature Does Not Reveal Itself All at Once 640
Everything Influences Everything 641
Theme 2: Children Play Active Roles in Their Own Development 641
Self-Initiated Activity 642
Active Interpretation of Experience 643
Self-Regulation 643
Eliciting Reactions from Other People 644
Theme 3: Development Is Both Continuous and Discontinuous 645
Continuity/Discontinuity of Individual Differences 645
Continuity/Discontinuity of Overall Development: The Question of Stages 646
Theme 4: Mechanisms of Developmental Change 648
Biological Change Mechanisms 648
Behavioral Change Mechanisms 649
Cognitive Change Mechanisms 651
Change Mechanisms Work Together 653
Theme 5: The Sociocultural Context Shapes Development 653
Growing Up in Societies with Different Practices and Values 653
Growing Up in Different Times and Places 655
Growing Up in Different Circumstances Within a Society 655
Theme 6: Individual Differences 656
Breadth of Individual Differences at a Given Time 657
Stability Over Time 658
Predicting Future Individual Differences on Other Dimensions 658
Determinants of Individual Differences 659
Theme 7: Child-Development Research Can Improve Children's Lives 660

Implications for Parenting 660
Implications for Education 662
Implications for Helping Children at Risk 662
Improving Social Policy 664

Glossary G-1

References R-1

Name Index NI-1

Subject Index SI-1

preface:

This is an exciting time in the field of child development. The past decade has brought new theories, new ways of thinking, new areas of research, and innumerable new findings to the field. We originally wrote *How Children Develop* to describe this ever-improving body of knowledge of children and their development and to convey our excitement about the progress that is being made in understanding the developmental process. We are pleased to continue this endeavor with the publication of the fourth edition of *How Children Develop*.

As teachers of child development courses, we appreciate the challenge that instructors face in trying to present these advances and discoveries—as well as the major older ideas and findings—in a one-semester course. Therefore, rather than aim at encyclopedic coverage, we have focused on identifying the most important developmental phenomena and describing them in sufficient depth to make them meaningful and memorable to students. In short, our goal has been to write a textbook that makes the child development course coherent and enjoyable for students and teachers alike.

Classic Themes

The basic premise of the book is that all areas of child development are unified by a small set of enduring themes. These themes can be stated in the form of questions that child development research tries to answer:

1. How do nature and nurture together shape development?
2. How do children shape their own development?
3. In what ways is development continuous and in what ways is it discontinuous?
4. How does change occur?
5. How does the sociocultural context influence development?
6. How do children become so different from one another?
7. How can research promote children's well-being?

These seven themes provide the core structure of the book. They are introduced and illustrated in Chapter 1, highlighted repeatedly, where relevant, in the subsequent fourteen content chapters, and utilized in the final chapter as a framework for integrating findings relevant to each theme from all areas of development. The continuing coverage of these themes allows us to tell a story that has a beginning (the introduction of the themes), a middle (discussion of specific findings relevant to them), and an ending (the overview of what students have learned about the themes). We believe that this thematic emphasis and structure will not only help students to understand enduring questions about child development but will also leave them with a greater sense of satisfaction and completion at the end of the course.

Contemporary Perspective

The goal of providing a thoroughly contemporary perspective on how children develop has influenced the organization of our book as well as its contents. Whole new areas and perspectives have emerged that barely existed when most of today's child development textbooks were originally written. The organization of *How Children Develop* is designed to present these new topics and approaches in the context of the field as it currently stands, rather than trying to shoehorn them into organizations that once fit the field but no longer do.

Consider the case of Piaget's theory and current research relevant to it. Piaget's theory often is presented in its own chapter, most of which describes the theory in full detail and the rest of which offers contemporary research that demonstrates problems with the theory. This approach often leaves students wondering why so much time was spent on Piaget's theory if modern research shows it to be wrong in so many ways.

The fact is that the line of research that began over 40 years ago as an effort to challenge Piaget's theory has emerged since then as a vital area in its own right—the area of conceptual development. Research in conceptual development provides extensive information on such fascinating topics as children's understanding of human beings, plants and animals, and the physical universe. As with other research areas, most studies in this field are aimed primarily at uncovering evidence relevant to current claims, not those of Piaget.

We adapted to this changing intellectual landscape in two ways. First, our chapter "Theories of Cognitive Development" (Chapter 4) describes the fundamental aspects of Piaget's theory in depth and honors his legacy by focusing on the aspects of his work that have proven to be the most enduring. Second, a first-of-its-kind chapter called "Conceptual Development" (Chapter 7) addresses the types of issues that inspired Piaget's theory but concentrates on modern perspectives and findings regarding those issues. This approach allows us to tell students about the numerous intriguing proposals and observations that are being made in this field, without the artificiality of classifying the findings as "pro-Piagetian" or "anti-Piagetian."

The opportunity to create a textbook based on current understanding also led us to assign prominent positions to such rapidly emerging areas as epigenetics, behavioral genetics, brain development, prenatal learning, infant cognition, acquisition of academic skills, emotional development, prosocial behavior, and friendship patterns. All these areas have seen major breakthroughs in recent years, and their growing prominence has led to even greater emphasis on them in this edition.

Getting Right to the Point

Our desire to offer a contemporary, streamlined approach led to other departures from the traditional organization. It is our experience that today's students take child development courses for a variety of practical reasons and are eager to learn about *children.* Traditionally, however, they have had to wait two or three or even four chapters—on the history of the field, on major theories, on research methods, on genetics—before actually getting to the study of children. We wanted to build on their initial motivation from the start.

Rather than beginning the book, then, with an extensive examination of the history of the field, we include in Chapter 1 a brief overview of the social and intellectual context in which the scientific study of children arose and provide historical

background wherever it is pertinent in subsequent chapters. Rather than have an early "blockbuster" theories chapter that covers all the major cognitive and social theories at once (at a point far removed from the content chapters to which the theories apply), we present a chapter on cognitive developmental theories just before the chapters that focus on specific aspects of cognitive development, and we similarly present a chapter on social developmental theories just before the chapters that focus on specific aspects of social development. Rather than have a separate chapter on genetics, we include basic aspects of genetics as part of Chapter 3, "Biology and Behavior," and then discuss the contributions of genetics to some of the differences among individuals throughout the book. When we originally chose this organization, we hoped that it would allow us, from the first weeks of the course, to kindle students' enthusiasm for finding out how children develop. Judging by the overwhelmingly positive response we have received from students and instructors alike, it has.

Features

The most important feature of this book is the exposition, which we have tried to make as clear, compelling, and interesting as possible. As in previous editions, we have given extra attention to making it accessible to a broad range of students.

To further enhance the appeal and accessibility of the text, we have retained three types of discussion boxes that explore topics of special interest. "Applications" boxes focus on how child development research can be used to promote children's well-being. Among the applications that are summed up in these boxes are board-game procedures for improving preschoolers' understanding of numbers; the Carolina Abecedarian Project; interventions to reduce child abuse; programs, such as PATHS, for helping rejected children gain acceptance from their peers; and Fast Track interventions, which help aggressive children learn how to manage their anger and antisocial behavior. "Individual Differences" boxes focus on populations that differ from the norm with regard to the specific topic under consideration, or on variations among children in the general population. Some of these boxes highlight developmental problems such as autism, ADHD, dyslexia, specific language impairment, and conduct disorder, while others focus on differences in the development of children that center on attachment status, gender, and cultural differences. "A Closer Look" boxes examine important and interesting research in greater depth than would otherwise be possible: the areas examined range from brain imaging techniques to discrepant gender identity to the developmental impact of homelessness.

We have also retained a number of other features intended to improve students' learning. These features include boldfacing key terms and supplying definitions both within the immediate text and in marginal glossaries; providing summaries at the end of each major section, as well as summaries for the overall chapter; and, at the end of each chapter, posing critical thinking questions intended to promote deeper consideration of essential topics.

New to the Fourth Edition

We have expanded our coverage of a number of research areas that have become increasingly important in recent years for both the students of child development and the instructors who teach it. In the following paragraphs, we outline some of

the highlights of the fourth edition. Thank you for taking the time to look through this new edition of *How Children Develop.* We hope that you find it to be useful and appealing.

New and Expanded Coverage

In selecting what to cover from among the many new discoveries about child development, we have emphasized the studies that strike us as the most interesting and important. While retaining and thoroughly updating its essential coverage, the fourth edition of *How Children Develop* continues to explore a number of fascinating areas in which there has been great progress in the past few years. Following is a very brief sampling of the many areas of new and expanded coverage:

- Epigenetics
- Gene–environment relations, including methylation
- The role of specific gene variants in certain behaviors
- Differential susceptibility to the environment
- Brain development and functioning
- Mechanisms of infants' learning
- Infants' understanding of other people
- Executive functioning
- Cultural influences on development
- Relations among understanding of time, space, and number
- Mathematics anxiety
- Applications of research to education
- The growing role and impact of social media in children's and adolescents' lives
- Interventions to foster children's social adjustment

Supplements

How Children Develop, Fourth Edition, features a wide array of multimedia tools designed for the individual needs of students and teachers. For more information about any of the items below, visit Worth Publishers' online catalog at www.worthpublishers.com.

LaunchPad with LearningCurve Quizzing

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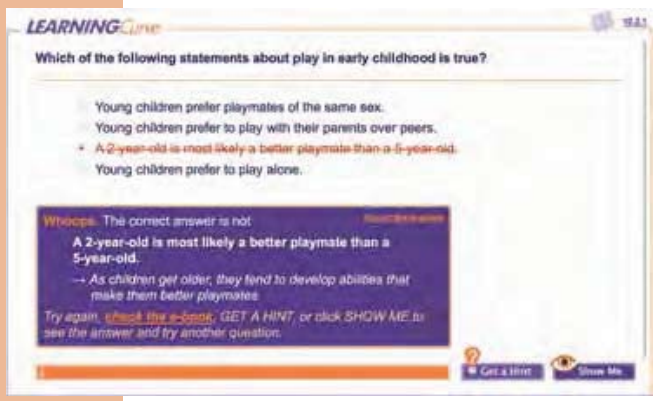

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How Children

DEVELOP

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DOROTHEA SHARP (1874-1955), *Young Explorers* (oil on canvas)

chapter 1:

An Introduction to Child Development

- **Reasons to Learn About Child Development**
  - Raising Children
  - Choosing Social Policies
  - Understanding Human Nature
  - Review
- **Historical Foundations of the Study of Child Development**
  - Early Philosophers' Views of Children's Development
  - Social Reform Movements
  - Darwin's Theory of Evolution
  - The Beginnings of Research-Based Theories of Child Development
  - Review
- **Enduring Themes in Child Development**
  - 1. *Nature and Nurture:* How Do Nature and Nurture Together Shape Development?
  - 2. *The Active Child:* How Do Children Shape Their Own Development?
  - 3. *Continuity/Discontinuity:* In What Ways Is Development Continuous, and in What Ways Is It Discontinuous?
  - 4. *Mechanisms of Development:* How Does Change Occur?
  - 5. *The Sociocultural Context:* How Does the Sociocultural Context Influence Development?
  - 6. *Individual Differences:* How Do Children Become So Different from One Another?
  - 7. *Research and Children's Welfare:* How Can Research Promote Children's Well-Being?
  - Review
- **Methods for Studying Child Development**
  - The Scientific Method
  - Contexts for Gathering Data About Children
  - Correlation and Causation
  - Designs for Examining Development
  - Ethical Issues in Child-Development Research
  - Review
- **Chapter Summary**

Themes

- Nature and Nurture
- The Active Child
- Continuity/Discontinuity
- Mechanisms of Change
- The Sociocultural Context
- Individual Differences
- Research and Children's Welfare

In 1955, a group of child-development researchers began a unique study. Their goal, like that of many developmental researchers, was to find out how biological and environmental factors influence children's intellectual, social, and emotional growth. What made their study unique was that they examined these diverse aspects of development for all 698 children born that year on the Hawaiian island of Kauai and continued studying the children's development for more than 30 years.

With the parents' consent, the research team, headed by Emmy Werner, collected many types of data about the children. To learn about possible complications during the prenatal period and birth, they examined physicians' records. To learn about family interactions and the children's behavior at home, they arranged for nurses and social workers to observe the families and to interview the children's mothers when the children were 1 year old and again when they were 10 years old. The researchers also interviewed teachers about the children's academic performance and classroom behavior during the elementary school years and examined police, family court, and social service records that involved the children, either as victims or perpetrators. Finally, the researchers administered standardized intelligence and personality tests to the participants when they were 10 and 18 years old and interviewed them at age 18 and again in their early 30s to find out how they saw their own development.

Results from this study illustrated some of the many ways in which biological and environmental factors combine to produce child development. For example, children who experienced prenatal or birth complications were more likely than others to develop physical handicaps, mental illness, and learning difficulties. But whether they developed such problems—and if so, to what degree—depended a great deal on their home environment. Parents' income, education, and mental health, together with the quality of the relationship between the parents, especially influenced children's development. By age 2, toddlers who had experienced severe prenatal or birth problems but who lived in harmonious middle-income families were nearly as advanced in language and motor skills as were children who had not experienced such problems. By the time the children were 10-year-olds, prenatal and birth problems were consistently related to psychological difficulties *only* if the children also grew up in poor rearing conditions.

What of children who faced both biological and environmental challenges—prenatal or birth complications *and* adverse family circumstances? The majority of these children developed serious learning or behavior problems by age 10. By age 18, most had acquired a police record, had experienced mental health problems, or had become an unmarried parent. However, one-third of such at-risk children showed impressive resilience, growing up into young adults who, in the words of Werner (1989, p. 108D), "loved well, worked well, and played well."

Michael was one such resilient child. Born prematurely, with low birth weight, to teenage parents, he spent the first 3 weeks of his life in a hospital, separated from his mother. By his 8th birthday, Michael's parents were divorced, his mother had deserted the family, and he and his three brothers and sisters were being raised by their father, with the help of their elderly grandparents. Yet by age 18, Michael was successful in school, had high self-esteem, was popular with his peers, and was a caring young man with a positive attitude toward life. The fact that there are many children like Michael—children who show great resilience in the face of adversity—is among the most heartening findings of research on

child development. Learning about the Michaels of the world inspires child development researchers to conduct further investigations aimed at answering such questions as why individual children differ so much in their response to similar environments, and how to apply research findings to help more children overcome the challenges they face.

Reading this chapter will increase your understanding of these and other basic questions about child development. It also will introduce you to some historical perspectives on these fundamental questions and to the perspectives and methods that modern researchers use to address them. But first, we would like you to consider perhaps the most basic question of all: Why study child development?

Reasons to Learn About Child Development

For us, as both parents and researchers, the sheer enjoyment of watching children and trying to understand them is reason enough for studying child development. What could be more fascinating than the development of a child? But there are also practical and intellectual reasons for studying child development. Understanding how children develop can improve child-rearing, promote the adoption of wiser social policies regarding children's welfare, and answer intriguing questions about human nature. We examine each of these reasons in the following sections.

ROBERT NICKELSBURG / GETTY IMAGES

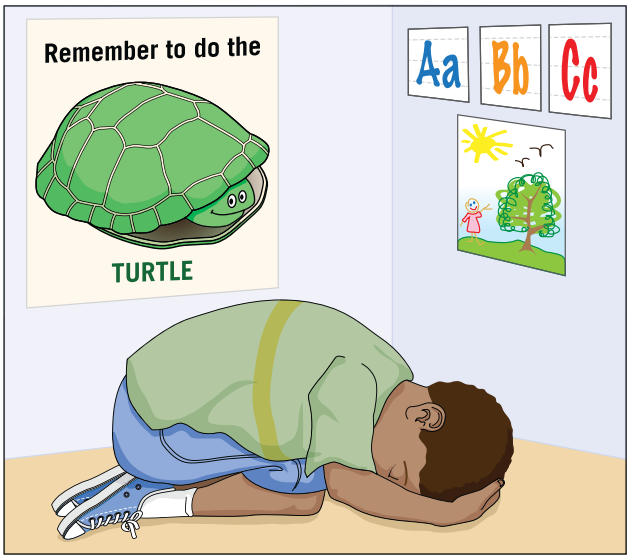
Will these children be resilient enough to overcome their disadvantaged environment? The answer will depend in large part on how many risk factors they face and on their personal characteristics.

Raising Children

Being a good parent is not easy. Among its many challenges are the endless questions it raises over the years. Is it okay to take my infant outside in the cold weather? Should my baby stay at home, or would going to day care be better for his social development? If my daughter starts walking and talking early, should I consider placing her in a school for gifted children? Should I try to teach my 3-year-old to read early? My son seems so lonely at preschool; how can I help him make friends? How can I help my kindergartner deal with her anger?

Child-development research can help answer such questions. For example, one problem that confronts almost all parents is how to help their children control their anger and other negative emotions. One tempting, and frequent, reaction is to spank children who express anger in inappropriate ways, such as fighting, name-calling, and talking back. In a study involving a representative U.S. sample, 80% of parents of kindergarten children reported having spanked their child on occasion, and 27% reported having spanked their child the previous week (Gershoff et al., 2012). In fact, spanking made the problem worse. The more often parents spanked their kindergartners, the more often the same children argued, fought, and acted inappropriately at school when they were 3rd-graders. This relation held true for Blacks, Whites, Hispanics, and Asians alike, and it held true above and beyond the effects of other relevant factors, such as parents' income and education.

Fortunately, research suggests several effective alternatives to spanking (Denham, 1998, 2006). One is expressing sympathy: when parents respond to their



Posters like this are used in the turtle technique to remind children of ways to control anger.

children's distress with sympathy, the children are better able to cope with the situation causing the distress. Another effective approach is helping angry children find positive alternatives to expressing anger. For example, encouraging them to do something they enjoy helps them cope with the hostile feelings.

These strategies and similar ones, such as time-outs, can also be used effectively by others who contribute to raising children, such as day-care personnel and teachers. One demonstration of this was provided by a special curriculum that was devised for helping preschoolers (3- and 4-year-olds) who were angry and out of control (Denham & Burton, 1996). With this curriculum, preschool teachers helped children recognize their own and other children's emotions, taught them techniques for controlling their anger, and guided them in resolving conflicts with other children. One approach that children were taught for coping with anger was the "turtle technique." When children felt themselves becoming angry, they were to move away from other children and retreat into their "turtle shell," where they could think through the situation until they were ready to emerge from the shell. Posters were placed around the classroom to remind children of what to do when they became angry.

The curriculum was quite successful. Children who participated in it became more skillful in recognizing and regulating anger when they experienced it and were generally less negative. For example, one boy, who had regularly gotten into fights when angry, told the teacher after a dispute with another child, "See, I used my words, not my hands" (Denham, 1998, p. 219). The benefits of this program can be long-term. In one test conducted with children in special education classrooms, positive effects were still evident 2 years after children completed the curriculum (Greenberg & Kusché, 2006). As this example suggests, knowledge of child-development research can be helpful to everyone involved in the care of children.

Choosing Social Policies

Another reason to learn about child development is to be able to make informed decisions not just about one's own children but also about a wide variety of social-policy questions that affect children in general. For example, how much trust should judges and juries place in preschoolers' testimony in child-abuse cases? Should children who do poorly in school be held back, or should they be promoted to the next grade so that they can be with children of the same age? How effective are health-education courses aimed at reducing teenage smoking, drinking, and pregnancy? Child-development research can inform discussion of all of these policy decisions and many others.

Consider the issue of how much trust to put in preschoolers' courtroom testimony. At present, more than 100,000 children testify in legal cases each year (Bruck, Ceci, & Principe, 2006). Many of these children are very young: more than 40% of children who testify in sexual-abuse trials, for example, are younger than 5 years, and almost 40% of substantiated sexual-abuse cases involve children younger than age 7 (Bruck et al., 2006; Gray, 1993). The stakes are extremely high in such cases. If juries believe children who falsely testify that they were abused, innocent people may spend years in jail. If juries do not believe children who accurately

report abuse, the perpetrators will go free and probably abuse other children. So what can be done to promote reliable testimony from young children and to avoid leading them to report experiences that never occurred?

Psychological research has helped answer such questions. In one experiment, researchers tested whether biased questioning affects the accuracy of young children's memory for events involving touching one's own and other people's bodies. The researchers began by having 3- to 6-year-olds play a game, similar to "Simon Says," in which the children were told to touch various parts of their body and those of other children. A month later, the researchers had a social worker interview the children about their experiences during the game (Ceci & Bruck, 1998). Before the social worker conducted the interviews, she was given a description of each child's experiences. Unknown to her, the description included inaccurate as well as accurate information. For example, she might have been told that a particular child had touched her own stomach and another child's nose, when in fact the child had touched her own stomach and the other child's foot. After receiving the description, the social worker was given instructions much like those in a court case: "Find out what the child remembers."

As it turned out, the version of events that the social worker had heard often influenced her questions. If, for example, a child's account of an event was contrary to what the social worker believed to be the case, she tended to question the child repeatedly about the event ("Are you sure you touched his foot? Is it possible you touched some other part of his body?"). Faced with such repeated questioning, children fairly often changed their responses, with 34% of 3- and 4-year-olds eventually corroborating at least one of the social worker's incorrect beliefs. Children were led to "remember" not only plausible events that never happened but also unlikely ones that the social worker had been told about. For example, some children "recalled" their knee being licked and a marble being inserted in their ear.

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In courtrooms such as this one, asking questions that will help children to testify accurately is of the utmost importance.

Studies such as this have yielded a number of conclusions regarding children's testimony in legal proceedings. One important finding is that when 3- to 5-year-olds are not asked leading questions, their testimony is usually accurate, as far as it goes (Bruck et al., 2006; Howe & Courage, 1997). However, when prompted by leading questions, young children's testimony is often inaccurate, especially when the leading questions are asked repeatedly. The younger children are, the more susceptible they are to being led, and the more their recall reflects the biases of the interviewer's questions. In addition, realistic props, such as anatomically correct dolls and drawings, that are often used in judicial cases in the hopes of improving recall of sexual abuse, do not improve recall of events that occurred; they actually increase the number of inaccurate claims, perhaps by blurring the line between fantasy play and reality (Lamb et al., 2008; Poole, Bruck, & Pipe, 2011). Research on child eyewitness testimony has had a large practical impact, leading many judicial and police agencies to revise their procedures for interviewing child witnesses to incorporate the lessons of this research (e.g., State of Michigan, Governor's Task Force, 2005). In addition to helping courts obtain more accurate testimony from young children, such research-based conclusions illustrate how, at a broader level, knowledge of child development can inform social policies.

Understanding Human Nature

A third reason to study child development is to better understand human nature. Many of the most intriguing questions regarding human nature concern children. For example, does learning start only after children are born, or can it occur in the womb? Can later upbringing in a loving home overcome the detrimental effects of early rearing in a loveless institutional setting? Do children vary in personality and intellect from the day they are born, or are they similar at birth, with differences arising only because they have different experiences? Until recently, people could only speculate about the answers to such questions. Now, however, developmental scientists have methods that enable them to observe, describe, and explain the process of development.

PETER TURNLEY / CORBIS

This infant is one of the children adopted from a Romanian orphanage in the 1990s. How successfully he develops will depend not only on the quality of caregiving he receives in his adoptive home but also on the amount of time he spent in the orphanage and the age at which he was adopted.

A particularly poignant illustration of the way in which scientific research can increase understanding of human nature comes from studies of how children's ability to overcome the effects of early maltreatment is affected by its timing, that is, the age at which the maltreatment occurs. One such research program has examined children whose early life was spent in horribly inadequate orphanages in Romania in the late 1980s and early 1990s (McCall et al., 2011; Nelson et al., 2007; Rutter et al., 2004). Children in these orphanages had almost no contact with any caregiver. For reasons that remain unknown, the brutal Communist dictatorship of that era instructed staff workers not to interact with the children, even when giving them their bottles. Staff members provided the infants with so little physical contact that the crown of many infants' heads became flattened from the babies' lying on their backs for 18 to 20 hours per day.

Shortly after the collapse of Communist rule in Romania, a number of these children were adopted by families in Great Britain. When these children arrived in Britain, most were severely malnourished, with more than half being in the lowest 3% of children their age in terms of height, weight, and head circumference. Most also showed varying degrees of mental retardation and were socially immature. The parents who adopted them knew of their deprived backgrounds and were highly motivated to provide loving homes that would help the children overcome the damaging effects of their early mistreatment.

To evaluate the long-term effects of their early deprivation, the physical, intellectual, and social development of about 150 of the Romanian-born children was examined at age 6 years. To provide a basis of comparison, the researchers also followed the development of a group of British-born children who had been adopted into British families before they were 6 months of age. Simply put, the question was whether human nature is sufficiently flexible that the Romanian-born children could overcome the extreme deprivation of their early experience, and if so, would that flexibility decrease with the children's age and the length of the deprivation.

By age 6, the physical development of the Romanian-born children had improved considerably, both in absolute terms and in relation to the British-born comparison group. However, the Romanian children's early experience of deprivation continued to influence their development, with the extent of negative effects depending on how long the children had been institutionalized. Romanian-born children who were adopted by British families before age 6 months, and who had therefore spent the smallest portion of their early lives in the orphanages, weighed about the same as British-born children when both were 6-year-olds. Romanian-born children adopted between the ages of 6 and 24 months, and who therefore had

spent more of their early lives in the orphanages, weighed less; and those adopted between the ages of 24 and 42 months weighed even less (Rutter et al., 2004).

Intellectual development at age 6 years showed a similar pattern. The Romanian-born children who had been adopted before age 6 months demonstrated levels of intellectual competence comparable with those of the British-born group. Those who had been adopted between ages 6 and 24 months did somewhat less well, and those adopted between ages 24 and 42 months did even more poorly (Rutter et al., 2004). The intellectual deficits of the Romanian children adopted after age 6 months were just as great when the children were retested at age 11, indicating that the negative effects of the early deprivation persisted over time (Beckett et al., 2006; Kreppner et al., 2007).

The early experience in the orphanages had similar damaging effects on the children's social development (Kreppner et al., 2007; O'Connor, Rutter, & English and Romanian Adoptees Study Team, 2000). Almost 20% of the Romanian-born children who were adopted after age 6 months showed extremely abnormal social behavior at age 6 years, not looking at their parents in anxiety-provoking situations and willingly going off with strangers (versus 3% of the British-born comparison group who did so). This atypical social development was accompanied by abnormal brain activity. Brain scans obtained when the children were 8 years old showed that those adopted after living for a substantial period in the orphanages had unusually low levels of neural activity in the amygdala, a brain area involved in emotional reactions (Chugani et al., 2001). Subsequent studies have identified similar brain abnormalities among children who spent their early lives in poor-quality orphanages in Russia and East Asia as well (Nelson et al., 2011; Tottenham et al., 2010).

These findings reflect a basic principle of child development that is relevant to many aspects of human nature: *The timing of experiences influences their effects.* In the present case, children were sufficiently flexible to overcome the effects of living in the loveless, unstimulating institutions if the deprivation ended relatively early; living in the institutions until older ages, however, had effects that were rarely overcome, even when children spent subsequent years in loving and stimulating environments. The adoptive families clearly made a huge positive difference in their children's lives, but the later the age of adoption, the greater the long-term effects of early deprivation.

review:

There are at least three good reasons to learn about child development: to improve one's own child-rearing, to help society promote the well-being of children in general, and to better understand human nature.

Historical Foundations of the Study of Child Development

From ancient Greece to the early years of the twentieth century, a number of profound thinkers observed and wrote about children. Their goals were like those of contemporary researchers: to help people become better parents, to improve children's well-being, and to understand human nature. Unlike contemporary researchers, they usually based their conclusions on general philosophical beliefs and informal observations of a few children. Still, the issues they raised are sufficiently important, and their insights sufficiently deep, that their views continue to be of interest.

Early Philosophers' Views of Children's Development

Some of the earliest recorded ideas about children's development were those of Plato and Aristotle. These classic Greek philosophers, who lived in the fourth century B.C.E., were particularly interested in how children's development is influenced by their nature and by the nurture they receive.

Both Plato and Aristotle believed that the long-term welfare of society depended on the proper raising of children. Careful upbringing was essential because children's basic nature would otherwise lead to their becoming rebellious and unruly. Plato viewed the rearing of boys as a particularly demanding challenge for parents and teachers:

> Now of all wild things, a boy is the most difficult to handle. Just because he more than any other has a fount of intelligence in him which has not yet "run clear," he is the craftiest, most mischievous, and unruliest of brutes.
>
> (*Laws,* bk. 7, p. 808)

Consistent with this view, Plato emphasized self-control and discipline as the most important goals of education (Borstelmann, 1983).

Aristotle agreed with Plato that discipline was necessary, but he was more concerned with fitting child-rearing to the needs of the individual child. In his words:

> It would seem . . . that a study of individual character is the best way of making education perfect, for then each [child] has a better chance of receiving the treatment that suits him.
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> (*Nicomachean Ethics,* bk. 10, chap. 9, p. 1180)

Plato and Aristotle differed more profoundly in their views of how children acquire knowledge. Plato believed that children have innate knowledge. For example, he believed that children are born with a concept of "animal" that, from birth onward, automatically allows them to recognize that the dogs, cats, and other creatures they encounter are animals. In contrast, Aristotle believed that all knowledge comes from experience and that the mind of an infant is like a blackboard on which nothing has yet been written.

Roughly 2000 years later, the English philosopher John Locke (1632–1704) and the French philosopher Jean-Jacques Rousseau (1712–1778) refocused attention on the question of how parents and society in general can best promote children's development. Locke, like Aristotle, viewed the child as a tabula rasa, or blank slate, whose development largely reflects the nurture provided by the child's parents and the broader society. He believed that the most important goal of child-rearing is the growth of character. To build children's character, parents need to set good examples of honesty, stability, and gentleness. They also need to avoid indulging the child, especially early in life. However, once discipline and reason have been instilled, Locke believed,

> authority should be relaxed as fast as their age, discretion, and good behavior could allow it. . . . The sooner you treat him as a man, the sooner he will begin to be one.
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> (Cited in Borstelmann, 1983, p. 20)

In contrast to Locke's advocating discipline before freedom, Rousseau believed that parents and society should give children maximum freedom from the beginning. Rousseau claimed that children learn primarily from their own spontaneous interactions with objects and other people, rather than through instruction by parents or teachers. He even argued that children should not receive any formal education until about age 12, when they reach "the age of reason" and can judge for

themselves the worth of what they are told. Before then, they should be allowed the freedom to explore whatever interests them.

Although formulated long ago, these and other philosophical positions continue to underlie many contemporary debates, including whether children should receive direct instruction in desired skills and knowledge or be given maximum freedom to discover the skills and knowledge for themselves, and whether parents should build their children's character through explicit instruction or through the implicit guidance provided by the parents' own behavior.

Social Reform Movements

Another precursor of the contemporary field of child psychology was early social reform movements that were devoted to improving children's lives by changing the conditions in which they lived. During the Industrial Revolution of the eighteenth and nineteenth centuries, a great many children in Europe and the United States worked as poorly paid laborers with no legal protections. Some were as young as 5 and 6 years; many worked up to 12 hours a day in factories or mines, often in extremely hazardous circumstances. These harsh conditions worried a number of social reformers, who began to study how such circumstances affected the children's development. For example, in a speech before the British House of Commons in 1843, the Earl of Shaftesbury noted that the narrow tunnels where children dug out coal had

> very insufficient drainage [and] are so low that only little boys can work in them, which they do naked, and often in mud and water, dragging sledge-tubs by the girdle and chain. . . . Children of amiable temper and conduct, at 7 years of age, often return next season from the collieries greatly corrupted . . . with most hellish dispositions.
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> (Quoted in Kessen, 1965, pp. 46–50)

The Earl of Shaftesbury's effort at social reform brought partial success—a law forbidding employment of girls and of boys younger than 10. In addition to bringing about the first child labor laws, this and other early social reform movements established a legacy of research conducted for the benefit of children and provided some of the earliest recorded descriptions of the adverse effects that harsh environments can have on children.

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During the eighteenth, nineteenth, and early twentieth centuries, many young children worked in coal mines and factories. Their hours were long, and the work was often unhealthy and dangerous. Concern over the well-being of such children led to some of the earliest research on child development.

Darwin's Theory of Evolution

Later in the nineteenth century, Charles Darwin's work on evolution inspired a number of scientists to propose that intensive study of children's development might lead to important insights into human nature. Darwin himself was interested in child development and in 1877 published an article entitled "A Biographical Sketch of an Infant," which presented his careful observations of the motor, sensory, and emotional growth of his infant son, William. Darwin's "baby biography"—a systematic description of William's day-to-day development—represented one of the first methods for studying children.

Such intensive studies of individual children's growth continue to be a distinctive feature of the modern field of child development. Darwin's evolutionary theory also continues to influence the thinking of modern developmentalists on a wide