CHILD DEVELOPMENT AND EDUCATION

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Seventh Edition

Child Development and Education

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To the many teachers, principals, counselors, psychologists, nurses, and other educational professionals who cherish every child in their care.

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About the Authors

Teresa M. McDevitt (left) is a psychologist with specializations in child development and educational psychology. She received a Ph.D. and M.A. in child development from Stanford University's Psychological Studies in Education program, an Ed.S. in educational evaluation from Stanford University, and a B.A. in psychology from the University of California, Santa Cruz. Now Professor Emerita of Psychological Sciences at the University of Northern Colorado, she served the University of Northern Colorado since 1985 in a variety of capacities—in teaching courses in child psychology, human development, educational psychology, program evaluation, and research methods; advisement of graduate students; administration and university governance; and research and grant writing. Her research focuses on child development, families, and teacher education. She has published articles in *Child Development, Learning and Individual Differences, Child Study Journal, Merrill-Palmer Quarterly, Youth and Society,* and *Science Education,* among others. She has gained practical experiences with children, including by raising two children with her husband and working as an early childhood teacher of toddlers and preschool children, early childhood special education teacher, and volunteer in school and community settings. Teresa enjoys spending time with her husband, their sons and their beloved partners, and, when she has the chance, traveling internationally with her family.

Jeanne Ellis Ormrod (right) is an educational psychologist with specializations in learning, cognition, and child development. She received a Ph.D. and M.S. in educational psychology at The Pennsylvania State University and an A.B. in psychology from Brown University; she also earned licensure in school psychology through postdoctoral work at Temple University and the University of Colorado, Boulder. She has worked as a middle school geography teacher and school psychologist and has conducted research in cognitive development, memory, problem solving, spelling, and giftedness. She is currently Professor Emerita of Psychological Sciences at the University of Northern Colorado; the "Emerita" means that she has officially retired from the university. However, she can't imagine ever *really* retiring from a field she enjoys so much, and so she continues to read and write about current research findings in educational psychology and child development. She is the author or coauthor of several other Pearson books, including *Educational Psychology: Developing Learners; Essentials of Educational Psychology; Human Learning; Practical Research: Planning and Design;* and *Our Minds, Our Memories: Enhancing Thinking and Learning at All Ages.* Jeanne has three grown children and three young grandchildren.

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Preface

As psychologists and teacher educators, we have taught child and adolescent development for many years. Our primary intention has been to help students translate developmental concepts into practical implications in their own teaching. In past years, the child development textbooks available to our students were thorough in their descriptions of theory and research but limited in concrete suggestions for working with infants, children, and adolescents. With this book, now in its seventh edition, we bridge the gap between theory and practice. We draw from innumerable theoretical concepts; research studies conducted around the world; and our own experiences as parents, teachers, psychologists, and researchers to identify strategies for promoting young people's physical, cognitive, and social-emotional growth. As in the previous editions, this book focuses on childhood and the adolescent years and derives applications that are primarily educational in focus.

Several features of the book make it different from other textbooks about child and adolescent development. In particular, the book

- Continually relates abstract theories to educational practices in schools
- Not only describes but also *demonstrates* developmental phenomena
- Guides observations of children
- Facilitates analysis of what children say, do, and create
- Offers concrete strategies for effective teaching of, and working with, children
- Fosters a thorough understanding of children's growth from infancy to late adolescence within the domains of physical, social-emotional, and cognitive development.

In the next few pages, we explain and illustrate how the book helps readers learn how to:

- Apply developmental insights in their work with children
- Refine their observations, assessments, and decisions
- Appreciate and accommodate children's upbringing
- Take a strategic approach to learning concepts in child development.

Concepts and the multitude of exercises are organized within sections devoted to specific learning objectives. For each objective, readers can engage with several exercises that solidify conceptual understandings and practical knowledge. Readers can review children's artwork and essays, observe children's actions and statements in video clips, and check their comprehension at the end of each section, with explanations immediately accessible to confirm expectations and correct misconceptions.

Seventh Edition

A primary goal for the seventh edition was to deepen readers' ability to employ a developmentally informed manner with children. That has been our goal since the first edition, yet our motivation intensified with the rising tide of research on strategies for nurturing children's academic skills and resilience. There is so much to share! We also realized that telling the developmental story effectively required thoughtful attention to pedagogy. We knew from our teaching and reading that fostering conceptual change requires accurate information; repeated exposure to abstract, difficult, and

counterintuitive ideas, a safe environment for trying out new knowledge; and feedback. We doubled our efforts to present concepts clearly, and we improved exercises by clarifying dimensions of a high-quality education. We hope that the resulting presentation is effective in promoting accomplishments in readers.

Focus on Development-Enhancing Education in the New Edition

In the seventh edition, we became more explicit about the whole and parts of developmentally informed instruction. To give our readers a coherent perspective on the field of child development, we distilled separate insights into a single notion. The insights came from investigations into developmentally appropriate practice, culturally responsive education, developmental systems perspectives, resilience, positive psychology, psychopathology and mental health, cognitive science, and youth-asset frameworks. Previously, these and other frameworks articulated single aspects of a high-quality education, yet collectively, they were fragmented. For the seventh edition, these frameworks were integrated into the powerful theme of a *development-enhancing education*.

Development-enhancing education refers to schooling that is warm, individualized, age appropriate, health promoting, culturally inclusive, and academically challenging. When teachers and other school professionals emulate these qualities, children thrive academically *and* developmentally. Educators need not choose between a strong education and attention to holistic childhood. With the right training, practice, and dispositions, educators can do both, and the result is a more vibrant learning environment for children. To help readers learn about development-enhancing education and its implications, we created several opportunities for exposure and practice:

1. In Chapter 1, the theme is introduced in text and its properties are illustrated in Table 1.2. Educators who provide children with a development-enhancing education exhibit five qualities: compassion, age-appropriate instruction, cultural inclusivity, attunement with individual needs, and encouragement of children's initiative.

Table 1.2 Properties of a Development-Enhancing Education

QUALITIES	EXAMPLES OF INDICATORS
Is compassionate with children	• Expresses interest, concern, and positive emotions when interacting with children • Over time establishes warm and secure relationships with children • Warmly invites children's contributions during class, validates their knowledge, and gently nudges them toward more advanced understandings
Harmonizes lessons, interactions, classroom procedures, and other services with children's age-related abilities	• Sets instructional objectives that are within the grasp of children • Selects academic concepts that are relevant, understandable, and consequential for children • Facilitates positive peer relationships in age-appropriate groups, classroom rules, and guidance on friendships
Is inclusive of the cultures, identities, and demographic backgrounds of the children, families, and communities being served	• Speaks to a classroom of children in a way that is inclusive and compatible with their cultural traditions • Shows sensitivity to the identities that children develop depending on their gender, race, ethnicity, religion, and national origin • Addresses the assets and hardships children experience in their communities
Is attentive to children's individual needs	• Designs instruction such that children of varying ability levels can achieve reasonable progress • Adapts instructional objectives, the format of the lesson, and assessment strategies for children for whom the lesson is not an optimally challenging exercise • Provides coaching for children who have trouble coping with transitions between subjects, dealing with anger or frustration, and attentional demands of school
Is encouraging of children's initiative during lessons, interactions, and decision making	• Arranges for children to share their knowledge at the beginning of a lesson, actively process information during the lesson, and demonstrate new knowledge at its conclusion • Allows children to make meaningful choices in curricular matters, for example, in which of several books to read or topics to examine in an essay • Engages children in active exploration of topics, for instance, by exploring a local habitat, acting out a scene in a play, and making predictions and analyzing data

4. The *Development in Culture* features foster readers' sensitivity to the traditions and values children inherit from their cultures, another essential feature of a development-enhancing education.

Development In Culture

Playing Around

From the perspective of cultural learning, play is a productive medium through which children voluntarily socialize themselves into their community's traditions (Boyette, 2016; F. P. Hughes, 2010).

To some degree, lessons in cultural practices change as children grow. Early on, adults guide the direction of play. Mothers, fathers, and other adults invite infants to join games of peekaboo, pat-a-cake, and other good-humored exchanges that vary from one cultural group to the next. One psychologist, Heidi Keller, found distinct patterns in infant play in mothers and infants from urban German middle-class families and rural Cameroonian Nso families (H. Keller, 2003). German mothers tended to spend a considerable amount of time interacting verbally with their infants—talking with them and encouraging themselves—developing verbal skills and playing with objects in German families and staying physically close to mothers and exercising new motor skills in Nso families.

Children continue to integrate familiar cultural routines into play as they grow. In societies that encourage serious chores in children, children pretend to be adult laborers (F. P. Hughes, 2010). In Botswana, men herd oxen, and boys regularly play the "cow game." Taking on complementary roles, some boys pretend to be oxen yoked with twine, and others act as drivers who control them (Bock & Johnson, 2004). Girls pretend to pummel grain with reeds, sticks, dirt, and imaginary mortars (Bock & Johnson, 2004). In industrialized cultures that separate children from the daily work of adults, children are apt to include fantasy figures that they have seen on television and in video games (F. P. Hughes, 2010; Lehrer & Petrakos, 2011). Not every culture values or encourages pretend play, and in some groups children play creatively with objects and with one another without taking on defined roles (Farver & Shin, 1997; F. P. Hughes, 2010; Smilansky, 1968).

In middle childhood and after, youngsters participate in structured games. Children in many societies play competitive games, wherein participants follow prescribed rules and vie to be the winner (Bonta, 1997; F. P. Hughes, 2010). In hunting societies, children play games of physical dexterity, including foot races and contests of tracking and spear-throwing, pursuits that allow for practice of valuable motor skills. In nomadic groups, children play games whose outcomes are determined by chance, perhaps preparing them for largely uncontrollable environmental conditions, as their parents must do to survive.

PLAYTIME. These boys enjoy a morning swim at a lake in Sri Lanka. While sharing a fun pastime, they are acquiring cultural knowledge about friendship and leisure time.

5. In addition to formulating recommendations for teachers and other professionals throughout the text, we provide *Development-Enhancing Education* features with concrete techniques for facilitating children's development. To help readers move from research to practice, each strategy is followed by examples of a professional implementing it in a classroom or other setting. You will find the *Development-Enhancing Education* illustrations in every chapter.

Development-Enhancing Education

Scaffolding Children's Performance on Challenging Tasks

Ask questions that get children thinking about a task.

- A middle school teacher asks her students a series of questions as they prepare to deliver a persuasive speech: *What are the main points you want to make? Who will make them? What kind of objections and counterarguments can you anticipate? How will you respond to them?* (Early Adolescence)
- As students in a high school science class begin to plan their experiments for an upcoming science fair, their teacher encourages them to separate and control variables with the following questions: *What do I think causes the phenomenon I am studying? What other possible variables might influence it? How can I be sure which variables are influencing the results I obtain?* (Late Adolescence)

When learners are unfamiliar with a task, provide explicit guidance and give frequent feedback.

- A preschool teacher watches children attempt to write their names. With a girl who writes the sequence backward, the teacher puts a green dot under the first letter and tells her to start with it. With a boy who forgets a few letters, the teacher highlights missing letters with a color pen. With another boy, the teacher writes the letters he cannot remember and asks has him to add the letters he knows. (Early Childhood)
- When an outdoor educator takes 12-year-olds on their first camping trip, he has the children work in pairs to pitch their tents. Although he has previously shown the children how to put up a tent, this is the first time they've actually done it themselves, and so he provides a sequence of pictures with instructions for each step. In addition, he circulates among campsites and provides assistance as necessary. (Early Adolescence)

Teach children how to talk themselves through a complex procedure.

- A school psychologist teaches children with cognitive disabilities to classify shapes by asking themselves questions (e.g., Does the object have three or more sides? Is it round?). The children begin to ask themselves these questions and learn to classify shapes more accurately. (Middle Childhood)
- A physical education teacher shows beginning tennis players how to use self-instructions to remember correct form when swinging the racket:
  1. Say *ball* to remind yourself to look at the ball.
  2. Say *bounce* to remind yourself to follow the ball with your eyes as it approaches you.
  3. Say *hit* to remind yourself to focus on contacting the ball with the racket.
  4. Say *ready* to get yourself into position for the next ball to come your way. (Early Adolescence)

Divide a complex assignment into several smaller, simpler tasks, and ask children to complete each in small groups.

- A fourth-grade teacher has his students create a school newspaper with news articles, a schedule of upcoming events, a couple of political cartoons, and classified advertisements. Several students work together to create each feature, with students assuming distinct roles (e.g., fact finder, writer, editor) and occasionally switching parts. (Middle Childhood)
- A film analysis teacher asks high school students to divide up their assignments into manageable parts and then share the results. After the class watches *Citizen Kane*,

Content Changes in the New Edition

More than 800 new citations are included with this edition, reflecting the many important discoveries that have been made in recent years. Every chapter includes updates that create a cutting-edge perspective on children's growth. With up-to-date knowledge, readers will be better prepared to meet the needs of children from many walks of life. Selected examples from each of the chapters include:

- **Chapter 1.** Added coverage of holistic perspective on childhood; development-enhancing education; educational equality and equity.
- **Chapter 2.** New material on measurement of stress; developmental dimensions with assessments, including progressions in children's vocabulary, physical coordination, and reasoning skills; children's understanding of the broad implications of achieving at a certain level on standardized achievement tests.
- **Chapter 3.** Reorganized sections of the chapter to allow for more foundational treatment of ethnicity and race, implicit bias, discrimination, prejudice, and educators' roles in ameliorating these problems; added strategies for reducing bias and addressing disparities; expanded coverage on the effects of divorce on children, school programs for children undergoing family transitions, parents raising children with special needs, and foster care.
- **Chapter 4.** Expanded coverage of transactions among genes, the environment, and the child (co-action, passive-gene environment, evocative reactions, active gene-environment relations); added evidence-based strategies for children with particular genetic conditions; material on universal design, educational needs of pregnant adolescents, and the learning capacity of the human fetus.
- **Chapter 5.** Added coverage of self-regulation of eating, sleep, and executive functions in the brain; food allergies; critical functions of sleep; brain connectivity; explicit age-related changes in brain during childhood; assistive devices and mobile applications for children with delayed motor skills; transgender youth.
- **Chapter 6.** In Piaget's theory, expanded section on association between assimilation and accommodation, discouragement of rushing children through childhood, and appreciating the legacy while accepting the need for revisions. In Vygotsky's theory, expanded section on digital literacy as a cognitive tool; age-related issues with computer use; strategies for cultivating digital literacy; universal design and meeting the needs of children with diverse learning needs.
- **Chapter 7.** Added new material on non-cognitive factors in the operations of cognitive processes, emotional needs and goals, and informational processing framework, stress and self-regulation, mindfulness, training and working memory, strategies for children with attention disorders, educational techniques recognizing variations in background knowledge.
- **Chapter 8.** Clarified basic features of intelligence, such as why children's abilities change with age while their IQ scores do not. Included new material on emotional intelligence (evidence for and against); school-based interventions for fostering children's emotional understanding and regulation; factors other than cognitive brainpower that affect performance on intelligence tests; relationships between intelligence and academic achievement; applications for children who are gifted and talented and peers with intellectual disabilities; neurological basis of intelligence; and Kagan Test of Intelligence.
- **Chapter 9.** Expanded sections on instrumental functions of neurological bases of language; working memory and prior knowledge in listening comprehension; strategies for helping children listen, attend, follow verbal instructions, draw inferences from what they hear, and develop metalinguistic insights. Elaborated on

diversity of language needs with attention to children growing up in low-income backgrounds; connections between bilingualism and metalinguistic awareness, ethnic dialects and formal English, and nonverbal learning disorders.

- **Chapter 10.** Expanded on the value of learning developmental changes in academic areas. Included digital applications for scaffolding steps and orchestration of cognitive processes for reading and writing. Added recommendations related to metacognition in mathematics and science.
- **Chapter 11.** Added educational applications for children with insecure attachments, applications for fostering healthy emotional development in children, and recommendations for fostering empathy in children. Provided an explanation of applications from the medical model, special education model, and three-tier models for intervention.
- **Chapter 12.** Added coverage of young people's communication on social networking sites and effects on self-perceptions and cyberbullying; characteristics and needs of gender nonconforming and transgender youth; challenges to self-esteem during adolescence; no-tease zones for disabilities; contexts in which children with autism might not understand the perspectives of other people; and neurological research on autism.
- **Chapter 13.** Added discussions of educational relevance of self-regulation; cultural contexts of self-regulation; effects of toxic stress on concentration and self-control; and how to strengthen self-regulation in children who have faced multiple significant hardships. Expanded discussions of achievement goals and cultural research; goal achievement theory; recent evidence regarding occasional benefits of performance approach goals; cultural dynamics of performance-avoidance goals; growth and fixed mindsets and interventions.
- **Chapter 14.** For moral development, expanded coverage of young children's emotional intuitions about morality, infants' reactions to unequal distribution of goods, neurological basis of morality, and contributions of theories to current understanding of moral development. For prosocial development and aggression, added discussions of animal maltreatment and other indicators of problems in adjustment, moral disengagement and aggressive tendencies, bystanders during bullying, and three-tier intervention model for addressing aggressive tendencies.
- **Chapter 15.** For peers, added strategies for helping children get along with classmates; a discussion of the benefits of friendships across ethnic lines; section on youth subcultures and descriptions of Hip Hop, Goths, Pro-Ana, and gangs. For schools, provided an introduction of Eccles's notion of stage-school fit; Pianta's theory of classroom processes. For society, discussed advantages and risks with social networking and video gaming; self-management skills with digital media.

Supplementary Materials

The following supplements are available to help instructors organize, manage, and enliven their courses and to enhance students' learning and development as teachers.

Online Instructor's Manual

Available to instructors for download at www.pearsonhighered.com/educator is an *Instructor's Manual* with suggestions for learning activities, supplementary lectures, group activities, and class discussions. These have been carefully selected to provide opportunities to support, enrich, and expand on what students read in the textbook.

Online PowerPoint® Slides

PowerPoint slides are available to instructors for download on www.pearsonhighered.com/educator. These slides include key concept summarizations and other graphic aids to help students understand, organize, and remember core concepts and ideas.

Online Test Bank

The *Test Bank* that accompanies this text contains both multiple-choice and essay questions. Some items (lower-level questions) simply ask students to identify or explain concepts and principles they have learned. But many others (higher-level questions) ask students to apply those same concepts and principles to specific classroom situations—that is, to actual student behaviors and teaching strategies. The lower-level questions assess basic knowledge of development and its implications in educational settings. But ultimately it is the higher-level questions that can best assess students' ability to use principles of child and adolescent development in their own teaching practice.

TestGen

TestGen is a powerful test generator available exclusively from Pearson Education publishers. You install TestGen on your personal computer (Windows or Macintosh) and create your own tests for classroom testing and for other specialized delivery options, such as over a local area network or on the web. A test bank, which is also called a Test

Item File (TIF), typically contains a large set of test items, organized by chapter and ready for your use in creating a test, based on the associated textbook material. Assessments—including equations, graphs, and scientific notation—may be created for both print and testing online. The tests can be downloaded in the following formats:

TestGen Testbank file—PC

TestGen Testbank file—MAC

TestGen Testbank—Blackboard 9 TIF

TestGen Testbank—Blackboard CE/Vista (WebCT) TIF

Angel Test Bank (zip)

D2L Test Bank (zip)

Moodle Test Bank

Sakai Test Bank (zip)

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T.M.M.
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Chapter One

Introduction to Child Development

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Learning Objectives

1.1 Describe the field of child development including its origins, focus, and basic issues.

1.2 Identify major characteristics and educational implications of the five developmental periods.

1.3 Differentiate among the seven major theoretical perspectives of child development in terms of their underlying principles and educational implications.

1.4 Formulate educational practices that foster children's age-related development and academic achievement.

CASE STUDY

Tonya

At any given moment, in almost every classroom, at least one child is having difficulty with the demands of school. The struggling child may be delayed in academic skills or could be inattentive to classroom rules or be rejected by peers. Mary Renck Jalongo remembers one little girl, Tonya, who faced each of these problems during her first-grade year (Jalongo, Isenberg, & Gerbracht, 1995).

Fortunately for Tonya, Mary was knowledgeable about children's development. Mary realized that Tonya, like every child, had positive qualities and, with the right support, could surmount her challenges. To determine how best to help Tonya, Mary considered Tonya's age, abilities, and circumstances. Academically, Tonya was delayed. She had been retained in kindergarten and was not catching up with her peers. Physically, Tonya received inadequate nutrition and was often hungry. Socially, Tonya had few friends. She had previously badgered classmates into giving her their snacks and prized possessions, and when they refused, she pilfered items from their desks.

Mary knew that Tonya did not receive the loving attention she needed. Tonya's mother was sick with lupus, then at a debilitating stage, and was not able to work or attend school functions. Mary's principal was unsympathetic and thought that harsh punishment—no recess for a month—was an appropriate response to Tonya's thefts.

Mary understood that Tonya was able to grow, change, and help solve some of her own problems. When Mary asked Tonya why she took other children's snacks, she answered simply that she was hungry. When asked if she ate breakfast, Tonya replied that she had not because she needed to take care of her younger brother. After Mary invited her to think about possible solutions, Tonya volunteered that she and her brother might be able to get breakfast at their aunt's house. After their discussion, Tonya followed through with this solution, walking with her brother to their aunt's house for an early morning meal.

Mary also realized that Tonya had the ability to repair relationships with her peers. After obtaining Tonya's promise that she would stop taking other children's things, Mary stood by Tonya's side and announced to the class that Tonya had agreed to stop taking her classmates' belongings. Afterward, Tonya earned the acceptance of the other children and began to concentrate on her schoolwork. She caught up with peers and ultimately blossomed into a healthy, well-adjusted young woman (M. R. Jalongo, personal communication, June 12, 2007).

- What knowledge of child development did Mary reveal in her support of Tonya?
- What kind of impact did Mary Jalongo have on Tonya's life?

Outline

Mary realized that Tonya could grow and change if given sensitive, loving care. By encouraging Tonya and her brother to eat breakfast with their aunt, Mary helped fulfill Tonya's physical needs and paved the way for closer ties to extended family. By repairing Tonya's damaged reputation with her peers, Mary helped Tonya earn their acceptance. Feeling comfortable physically and secure emotionally, Tonya became better prepared to tackle academic tasks and develop a healthy sense of who she was and how she fit into the world around her. Thanks, in part, to Mary's thoughtful intercession, Tonya would ultimately thrive.

We know that you, too, want to educate children in the most effective ways possible. Our primary goal with this book is to help you support the healthy development of all children in your care. We pursue this goal with two approaches. First, we ask you to learn how children think, feel, and act at various ages. Becoming sensitive to children's age-related characteristics is an important part of your preparation as a skilled educator. Second, we ask you to apply what you learn about child development to help all children succeed. We do so by explaining and showing you practical techniques for nurturing children.

The Study of Child Development

1.1 Describe the field of child development including its origins, focus, and basic issues.

The field of **child development** seeks to identify and explain changes in the physical, cognitive, and social-emotional development of children. Child development theory covers the early part of the human life span—beginning with the union of sperm and ovum at conception and extending through prenatal growth, birth, infancy, childhood, and adolescence.

Origins of the Field

For thousands of years, and probably since the dawn of humanity, people wondered how and why children grow as they do. In the last few centuries, these musings took form as philosophical positions. For example, the British philosopher, educator, and physician **John Locke** (1632–1704) suggested that human beings are born as blank slates. Locke saw children as empty vessels who were eager to learn, especially through their senses (Overton & Molenaar, 2015). According to Locke, parents met children's needs by instilling good habits and encouraging virtue and rationality.

Another influential philosopher, **Jean-Jacques Rousseau** (1712–1778), was born in Geneva, Switzerland and became well known in France for his political theories. Rousseau believed that children were inherently good actors in the natural world who were capable of making decisions (Elkind, 2012). From Rousseau's perspective, a sound education allowed children to explore their surroundings and develop critical thinking abilities. Parents were to lead by example and wait a while to introduce society's expectations. Pressuring children to grow up too quickly would distort their natural intuitions. Adults were to let children be children.

By the late 1800s and early 1900s, philosophical arguments promoted a desire for evidence. Biologists, psychologists, anthropologists, and educators began to study children, sometimes documenting growth in their own offspring (Charlesworth, 1994). From these observations, the field of child development emerged. Also foundational to the new field was a concern for the welfare of children, especially those from economically disadvantaged backgrounds (Hulbert, 1999). Scholars realized that they had a responsibility to use scientific information to improve children's lives, particularly when adversity was significant.

As data accumulated, investigators were able to evaluate the philosopher's ideas against the evidence. Developmental scientists agreed with Locke that infants are eager to learn yet disagreed that their minds were ever empty. Clever research methods showed that infants are capable of perceiving the visual properties of objects, the structure of language, and the existence of emotions. Scholars likewise determined that Rousseau's respect for children's curiosity was well justified, yet his discounting of adult guidance was not. Researchers from a range of disciplines found that parents, teachers, and other caring adults play an integral role in children's learning and adjustment.

After decades of research, developmental growth is now understood to be the result of an active interplay of factors. This complexity warrants multiple frameworks, each explaining one or more changes the child undergoes. In this book, we draw primarily

from the disciplines of psychology, biology, sociology, and anthropology, and the applied fields of early intervention, education, child and family studies, juvenile justice, counseling, social work, and medicine. We emphasize research that has practical implications for children at school.

Essential Features of Development

Developmental scientists have identified three defining features of development. First, developmental changes are *progressive*: Children gradually become capable and responsible, even though they sometimes revert to lesser forms, as when a 4-year-old girl who has learned to talk through disagreements occasionally regresses when angry, to hitting classmates. Second, developmental changes are *persistent*: Once a new ability is introduced, it typically remains in the child's repertoire of skills, as occurs with walking and talking. Finally, developmental changes are *cumulative*: A new ability builds on the previous ones, as when a toddler shifts from speaking one word to uttering two-word combinations and later to speaking in complex sentences.

The progressive, persistent, and cumulative changes of childhood are themselves the result of four factors. Contributors to the developmental journey include the following:

- *Existing conditions.* The characteristics of the child's brain, body, and psychological states allow for new possibilities.
- *Nature.* The child's genetic inheritance enables and directs certain kinds of growth.
- *Nurture.* The child's physical environment, nutrition, interpersonal relationships, and the broader setting in which he or she interacts invite particular kinds of responses and initiative, meet the body's needs, and fulfill other conditions for growth.
- *The child's activity.* The child's choices and behaviors influence the emergence of new and changing states.

As you will discover in your reading, development includes certain changes that occur in almost everyone as well as others that are common in a fewer number, sometimes only in those who share a characteristic, such as having a particular gene or experiencing homelessness. Thus, at times, we talk about developments that nearly everyone undergoes, such as acquiring mature language skills or becoming increasingly considerate of other people's feelings, and in other situations, we emphasize diversity, as when some children respond to academic struggles by seeking support from teachers and others withdraw from school (M. B. Spencer, 2006).

Three Domains of Development

The study of child development is organized into three domains. **Physical development** is concerned with biological changes in the body. It includes genetics, growth in the womb, the sequences of childbirth, brain development, acquisition of motor skills, and behaviors that promote and impede health. **Cognitive development** refers to age-related transformations in reasoning, concepts, memory, language, and intellectual skills—changes that are cultivated by involvement in families, schools, and communities. **Social-emotional development** includes the many modifications that occur in emotions, self-concept, motivation, social relationships, and moral reasoning and behavior—advancements that depend, in large part, on interactions with other people.

Although the three domains appear to be independent, they are, in fact, closely intertwined. Getting physical exercise fosters mental concentration, learning a second language facilitates new friendships, and, as occurred with Tonya, feeling emotionally supported by a teacher motivates learning at school. When educators respect the entirety of psychological functions, they are taking a **holistic perspective on child development**. Wise educators realize that the child is greater than the sum of his or her separate parts, and although it often makes sense to focus in on a single skill, for example, reading comprehension, the child's welfare depends on simultaneous consideration of each of the domains.

Preparing for Your Licensure Examination

Your teaching test might ask you to identify the kinds of growth that occur in the cognitive, social-emotional, and physical domains.

Effects of Context on Development

All areas of development depend on the **contexts** of children's lives—on their experiences in families, schools, neighborhoods, community organizations, cultural and ethnic groups, and society at large. Child development research has shown that some sort of family or presence of one or more affectionate parent figures is necessary for optimal development. Schools, too, play a significant role, not only by cultivating cognitive skills but also by supplying teachers and classmates as social partners. In neighborhoods, children gain access to peers and recreation and, in society, media, social services, banks, clinics, libraries, courts, and houses of worship. As a member of one or more **cultures**—long-standing groups with defined values, traditions, and symbol systems—children engage in daily activities with familiarity and purpose.

Becoming aware of children's upbringing, as Mary did in the introductory case study, is a necessary step for understanding the knowledge, skills, and needs students bring to school. When children face serious problems, perhaps malnutrition, death in the family, or exposure to community violence, concerned educators often find it helpful to seek out informed colleagues who can help them determine how to reassure children, find appropriate referrals, reach out to the family, and ameliorate threats to safety.

The dynamics of children's development are also worthy of your attention. Gaining an appreciation for three dimensions of development will enhance your ability to foster growth in the heterogeneous collection of children you serve. First, experts in child development wonder how genetic and environmental factors combine during development. Second, they speculate about which developmental paths are true for everyone and which others are unique to individuals and those who share certain characteristics. Third, they debate about the developmental changes that reflect major transformations or, alternatively, are the result of a series of gradual trends. Let's look closely at these three issues, which are referred to as questions of (a) nature and nurture, (b) universality and diversity, and (c) qualitative and quantitative change.

Nature and Nurture

In the study of development, **nature** refers to the inherited characteristics that influence growth. **Nurture** consists of the environmental conditions that affect the progression of changes. Nature and nurture are partners in growth.

Nature contributes to both common traits and individual differences in children. Some genes (the basic units of heredity) appear in virtually everyone. Almost all infants are born with a capacity to learn to walk, understand language, imitate others, use simple tools, and draw inferences about how other people view the world. Other characteristics, including stature, eye color, and facial appearance, are strongly determined by heredity and cause variations among children. Similarly, children's **temperaments**—their characteristic ways of responding to emotional events, novel stimuli, and impulses—are likewise affected by their individual genetic makeup (J. R. Gagne & Saudino, 2016; Rothbart & Bates, 2006; Z. Wang & Deater-Deckard, 2013). Similarly, being slow or quick to learn at school and from everyday experiences has a partial genetic basis (Petrill et al., 2004; Plomin & Deary, 2015).

Heredity is powerful, but it has limits. For one thing, the child's stage of growth affects which genes come into play. Whereas some hereditary instructions, such as the chromosomes that determine sex, exert an influence from the beginning, other instructions emerge only gradually through the process of **maturation**, the genetically guided changes that occur over the course of development. For example, puberty begins when the pituitary gland in the brain senses it is time to release certain hormones, the excretion of which initiates sexual maturation.

Children's experiences affect all aspects of their being, from the health of their bodies to the curiosity of their minds. *Nurture* affects children's development through multiple channels: physiologically through nutrition, activity, affection, light, stress, pollutants, and contagious illness; intellectually through informal experiences and academic instruction; and socially through exposure to role models and interaction in interpersonal relationships. However, nurture faces definite limits. Even the best

environments cannot overpower every defective gene. And, unfortunately, healthy environments are not always available. Abuse, neglect, poor nutrition, and racism are just a few threats that some children encounter.

Decades ago, theorists saw nature and nurture as rival factors. Numerous early theorists believed that biological factors are ultimately responsible for growth. Other theorists assumed that children become whatever the environment shapes them to be. Neither extreme position has stood the test of time. Present-day theorists appreciate that nature and nurture intermesh dynamically in the lives of active children. Consider the following principles of how nature and nurture interact.

The developmental process constrains growth. Genes and environment alone are not sufficient to explain the complex sequence of events in brain and body. The developmental process, as guided by existing structures, channels future growth and learning (Champagne, 2009; Sabbagh, Koenig, & Kuhlmeier, 2016; Stiles, 2008). During prenatal development new cells specialize and move to strategic locations depending on signals they receive from nearby cells. In the globular hands that first emerge during prenatal development, cells at the top of budding extensions respond to certain chemicals by duplicating and taking on specified properties. Precursors to fingers sprout, elongate, and differentiate into the elegant digits that will later permit drawing, keyboarding, and fastening buttons. This same principle applies to learning. Children acquire new knowledge based on what they already know and can do. Preferences in the brain at birth direct attention to certain kinds of phenomena, such as looking at facial expressions and listening to speech.

The relative effects of heredity and environment differ across distinct areas of development. Some abilities are strongly influenced by genetically controlled systems in the brain. Distinguishing among various speech sounds and using appropriate grammatical structures occur without formal training and under a wide range of environmental conditions (Archer & Curtin, 2011; Gallistel, Brown, Carey, Gelman, & Keil, 1991). In contrast, abilities in traditional school subject areas (e.g., reading, geography, and music) rely heavily on instruction (Bruer, 1999; R. K. Olson, Keenan, Byrne, & Samuelsson, 2014).

Inherited tendencies make children more or less responsive to particular environmental influences. Because of their unique genetic makeup, some children are deeply affected by certain stimuli, whereas others are less affected (Rutter, 1997; Zhang, Cao, Wang, Ji, & Cao, 2016). For example, some children are born exceptionally sensitive to the quality of caregiving and, when exposed to abuse and other adverse life events, become highly aggressive themselves, whereas children without this vulnerability tend not to be seriously affected by similar exposures (Hygen et al., 2015). A few other children are inclined by their genetic heritage to be shy and inhibited and, when they have few social experiences outside the family, to be nervous around strangers. However, if adults arrange for them to make friends, these otherwise reserved children are apt to become socially outgoing (Arcus, 1991; Kagan & Fox, 2006).

Some genes exert effects only under certain conditions. Some children are born with particular genes that put them at risk for developing psychological problems. A specific chemical, serotonin, is produced in the brain and influences a person's mood. Some people have a short form of a gene (known as 5-HTT), with the result that their brain struggles to recycle serotonin, and consequently to maintain positive emotions. Individuals with this particular form of the gene are at risk for being chronically sad and irritable. Yet the short form of this gene does not typically culminate in full-blown depression unless the individual was maltreated during childhood (Caspi et al., 2003).

Certain hereditary characteristics develop more fully in nurturing settings than in impoverished environments. Children raised by parents who are warm, involved, and sensitive are generally able to develop skills and qualities that are compatible with their heredity profiles. Children who grow up with adequate nutrition, a warm and stimulating home environment, and challenging educational experiences are able to

make many of their own choices, and heredity affects how quickly and thoroughly they acquire new skills. When children receive little human contact or grow up in coercive families, they cannot make choices that would allow certain genetic tendencies to emerge (A. B. Miller et al., 2018; D. C. Rowe, Almeida, & Jacobson, 1999; Venables & Raine, 2016).

Timing of environmental exposure matters. When children are changing rapidly, they are especially prone to influence. Early in a mother's pregnancy, her use of certain drugs can damage the offspring's quickly growing organs and limbs. Just prior to birth, exposure to the same drugs may adversely affect the baby's brain, which at that point is forming neurological connections for learning. For a few years after birth, the brain continues to develop rapidly and remains vulnerable to harmful substances.

Just as certain substances need to be avoided during particular phases of growth, particular kinds of stimulation must be provided for a few abilities to be activated (C. Blakemore, 1976; Hubel & Wiesel, 1965; Niechwiej-Szwedo, Chin, Wolfe, Popovich, & Staines, 2016). When a certain stimulation is required for a physiological structure to become activated, a *critical period* is said to take place. For example, at birth, specified regions of the brain are tentatively reserved for processing visual patterns—lines, shapes, contours, depth, and so forth. Virtually all infants encounter adequate stimulation to preserve these brain circuits. However, when cataracts are present at birth and not removed for a few years, or when the child's vision is obstructed for some other reason, areas of the brain that would otherwise develop visual functions permanently redirect themselves for other purposes.

With many other abilities, the brain is receptive to stimulation at one point yet capable of benefiting from it later as well. Developmental theorists use the term **sensitive period** to refer to the rather lengthy time frame of heightened receptivity to environmental experience (Curley & Champagne, 2016). Sensitive periods appear to be more common than critical periods, reflecting nature's fortunate practice of giving children second chances to learn important skills. For example, during early childhood, children are predisposed to tune in to the sounds, structure, and meaning of language. They are essentially hungry to process verbal information and easily build neurological foundations for language from the input they encounter. When there are delays, educators can realistically expect to make meaningful progress by arranging for missing experiences.

Children's actions partly determine resources accessible to them. In addition to being affected by nature and nurture, children's growth is influenced by their own behaviors. Youngsters make many choices, seek out information, and, over time, refine their knowledge and beliefs. Children often request information ("What does *cooperate* mean, Mommy?") and experiences ("Ignacio, can I play on your computer?"). Children even create environments that intensify their genetic tendencies. Those with irritable dispositions might pick fights, thereby creating a more aggressive climate in which to interact.

As children get older, they become increasingly able to seek information and experiences that suit their natural tendencies. Imagine that Marissa has an inherited talent for verbal processing. As a young child, Marissa depends on her parents to read to her. As she grows older, Marissa chooses her own books and reads by herself. Marissa's experience would suggest that certain genetic tendencies become more powerful as children grow older—an expectation that is consistent with genetic research (Scarr & McCartney, 1983; Trzaskowski, Yang, Visscher, & Plomin, 2014).

Universality and Diversity

Developmental changes that occur in just about everyone reflect **universality**. Unless significant disabilities are present, all young children learn to sit, walk, and run, almost invariably in that order. Other developmental changes are highly individual or differ between groups—for example, between boys and girls or among members of different cultures. These variations reflect **diversity** and remind us of the many healthy manifestations and a few maladaptive pathways that are found in children's growth.

Theorists differ in their beliefs regarding the extent to which developmental accomplishments are universal among human beings or unique to individuals and groups. Some scholars emphasize that shared genes and maturational processes contribute to

universality (e.g., A. Gesell, 1928). They point out that despite widely varying environments, virtually all human beings acquire basic motor skills, proficiency in language, and the ability to inhibit immediate impulses. Certain consistencies in children's environments provide an additional route to universality. In all corners of the world, children observe objects falling down rather than up and people getting angry when someone intentionally harms them. From these everyday observations, children acquire an intuitive sense of physics and psychology. Similarly, children just about everywhere participate in household chores that prepare them for adult roles.

Other scholars are impressed by diversity in child development. They point out that nature permits variations in genes affecting facial features, physical characteristics, temperament, and intellectual abilities. Many of the diversity-oriented theorists view the environment (nurture) as weighing heavily in development. They propose that factors as global as the historical era of one's upbringing and as personal as one's relationships with family and friends generate individuality (Baltes, Lindenberger, & Staudinger, 2006; Flouri & Sarmadi, 2016). Another source of diversity is culture: Children differ in the competencies they acquire based on the particular languages, tools, activities, and values they encounter (Griedler & Shields, 2008; Paradise & Robles, 2016; Rogoff, 2003).

Earlier we mentioned that the relative influences of nature and nurture vary from one area to the next. The same pattern is true with universality and diversity. Development tends to be similar in some aspects of physical development, such as the order of early motor skills and sequences in which puberty unfolds. In other areas, including many aspects of cognitive and social-emotional development, diversity is prevalent. In fact, there is always *some* diversity, even in physical development. Obviously, children vary in height, weight, and skin color, and a few are born with physical disabilities, start puberty comparatively early or late, or become seriously injured.

If you consider children you know, you will probably see instances of universality, but just as often you are likely to notice divergences in developmental pathways. Gaining an appreciation for both commonalities and exceptions will help you meet everyone's needs. As a second-grade teacher, you may find that most of your students enjoy listening quietly to a few pages of a favorite book. Aware of unique needs in your class, you arrange for one boy to sit near you as you read, two English language learners to listen to the story prerecorded in their native language, and a girl who has an intellectual ability to page through a homemade picture book of the story.

Qualitative and Quantitative Change

Sometimes development reflects dramatic changes in the underlying structure of a characteristic. These major reorganizations are called **qualitative changes**. When children learn to run, they propel their bodies forward in a way that is distinctly different from walking—they are not simply moving faster. When they begin to talk in two-word sentences rather than with single words, they are, for the first time, using a rudimentary form of grammar. And when they shift from obeying a teacher because they do not want to be punished to following classroom rules because it is the right thing to do, they are transforming the way they think about morality. With a qualitative change, there is a metamorphosis, such that the organism takes existing states and converts them into entirely new forms. Just as a tadpole is transformed into a frog, a caterpillar

into a butterfly, and a seed into a plant, the infant turns into an adult through a series of dynamic restructurings.

In comparison to the overhaul that occurs with qualitative change, other developments are gradual progressions, or *trends*, with many small additions. These incremental progressions in behavior, physical states, and learning are called **quantitative changes**. For example, children gradually grow taller and learn more and more about such diverse realms as the animal kingdom and society's rules for showing courtesy.

As you are learning, both qualitative and quantitative changes contribute to the child's development, yet scholars have been especially fascinated with the former. Theorists who emphasize *qualitative* changes often use the term **stage** to refer to a period of development characterized by an exact way of behaving or thinking. According to a **stage theory** of development, individuals progress through a series of stages that are qualitatively different from one another.[1] Some stage theories specify movement through *hierarchical* levels. In hierarchical models, each stage is seen as providing the essential foundation for modifications that follow.

After observing children in a wide variety of thought-provoking situations, the eminent psychologist **Jean Piaget** (1896–1980) proposed a stage theory in children's logical reasoning. His observations led him to conclude that as infants, children interact with the world primarily through trial-and-error exploration. As infants mouth a rubber ball and watch it roll, they discover its properties. As children mature, they symbolically represent concepts and make mental predictions about objects and actions. They know from experience that the ball will bounce on the wooden floor. Later they begin to derive logical inferences, perhaps concluding that the ball is made out of a pliable substance. And once they reach adolescence, they become capable of thinking systematically about abstract ideas—for instance, in conceiving of unseen physical forces (e.g., *momentum, gravity*).

Another famous stage theorist, **Erik Erikson** (1902–1994), focused on major challenges that individuals face at different points in their lives. During their infancy and early childhood, youngsters learn first to trust others and then to act self-sufficiently. Adolescents reflect on their identities as boys or girls, as members of particular ethnic groups, and as individuals with defined interests and goals. In Erikson's theory, people do not fully replace earlier developments with new modes of thinking (Kohlberg, Levine, & Hewer, 1983). Instead, earlier struggles persist—and sometimes intrude—into new challenges. Thus, a young adult who has failed to develop a clear identity may be confused about the role to play in a romantic relationship (J. Kroger, 2003).

Historically, stage theories emphasized *universal* stages: All children were thought to go through the same cycle of changes, with slight variations in timing because of dissimilarities in environmental support. Piaget was a strong believer in universal progressions in children's thinking. However, research has not entirely confirmed that young people proceed through general stages one at a time or that they always move in the same direction (e.g., Ceci & Roazzi, 1994; Giammarco, 2016). A 9-year-old girl may easily plan ahead while playing chess (her hobby) but strain to design a complex essay (an unfamiliar activity). Nor do stage progressions always appear to be universal across cultures and educational settings (e.g., Arnold, 2015; S.-C. Li, 2007; Seiffge-Krenke, 2016).

[1]Note that developmental scholars have a more precise meaning for the term *stage* than is communicated by the same word in everyday speech. Parents often make comments like "He's at the *terrible twos stage*." Such comments reflect the idea that children are behaving typically for their age group. When developmental scientists say a child is in a certain stage, they additionally assume that the child is undergoing a series of age-related transformations that represent a qualitative overhaul to one or more aspects of thinking or behavior.