THIRD EDITION

Child & Adolescent Development in Your Classroom

TOPICAL APPROACH

CHRISTI CROSBY BERGIN • DAVID ALLEN BERGIN

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Dedication

This book is dedicated to our grandchildren, Ian, Anna, Bridget, William, and Nathan, who bring sparkle to this work.

Contents

Preface

Understanding child development is important to becoming an effective teacher. In Chapter 10 you will be introduced to Josh, who was one of the most difficult children in Mrs. Wentz's 25-year career as a teacher. He was involved in fighting, lying, skipping school, defying authority, and failing to complete work. After altercations involving the juvenile court officer, Josh was suspended—sent home where his mother used drugs and his father was angry and punitive. Other students were afraid of Josh. Mrs. Wentz was in Christi's child development class when we were test-driving the first edition manuscript for this textbook, and she began putting the concepts to use in her classroom with Josh. Mrs. Wentz began to feel more confident about how to help Josh, and subsequently, Josh began to complete his schoolwork and became helpful in the class. Mrs. Wentz said that learning about child development caused her to look at each student with more insight and that she had become a better teacher—and human being—as a result.

This textbook is designed for prospective teachers of infants through adolescents. Teachers of different age groups need to collaborate in order to provide seamless education as children transition from preschool through high school. When teachers of all age groups study child development together, they create a shared understanding of children that will promote children's success.

This textbook is about child development. However, it has some content that is traditionally found in "educational psychology" texts. Thus, teacher education programs that combine child development and educational psychology into a single course may find this text appropriate.

Our Goal: Promote Outstanding Teaching

If there is a silver bullet in education, it is teaching quality. Effective teachers raise the achievement of all children and narrow the achievement gap. Even one outstanding teacher can influence the course of a child's life. Children who are lucky enough to have many outstanding teachers across the years receive a substantially better education than children who are less lucky.

How does a teacher learn to be outstanding? One key pathway is to learn the science of child development and know how to apply it in the classroom. This provides teachers with the information they need to problem solve how to best educate each

child. To be successful, teachers must understand each child as a learning, feeling, relating human being. The goal of this text is to help teachers create classrooms that optimize children's development.

A Distinctive Text

This text is "research-based," incorporating the latest science. Several thousand articles in peer-reviewed journals are summarized in the text. We have worked to make this research accessible to prospective teachers with everyday language and authentic vignettes of children of all ages, from infants to adolescents. Previous courses in psychology are not required to understand the text. Still, many research-based child development textbooks are available. What makes this one unique? The answer: the strong bridge between research and classroom application.

Classroom Application

In 2007 the National Institute of Child Health and Human Development and the National Council for the Accreditation of Teacher Education jointly reported that child development courses do not consistently offer realistic illustrations of developmental concepts or adequately tie concepts to classroom settings (NICHD & NCATE, 2007). This textbook is designed to overcome this problem through the following features:

- Research-based strategies that teachers can use in their classrooms are provided for each major topic.
- Authentic classroom vignettes are used to illustrate concepts.
- Topics are covered that are of keen interest to teachers, but that are not included in traditional child development texts (e.g., discipline, teacher–student relationships, how emotions affect learning).
- Explicit connections are made between theories and the teaching of mathematics and literacy in Chapters 4 and Chapters 12.
- Each chapter ends with a *Reflections on Practice* page that asks teachers to reflect on their behavior in the classroom and how it influences children.

This text is child-centered, putting the development of the child at the forefront of the content, providing readers with research- and theory-based knowledge of developmental psychology, while also providing strong practical skills for applying that knowledge in their classrooms.

Diversity

This text emphasizes diversity. Each major topic discusses both individual diversity and group diversity. Understanding diversity helps teachers differentiate pedagogy for students who come to class with widely different experiences and cultural backgrounds. Culture is introduced at the beginning of the text, and then discussed in subsequent chapters when relevant, rather than presented as a stand-alone topic in an isolated chapter.

Text Organization

Child development textbooks take either a chronological or a topical approach. We have combined the approaches—the text is organized topically across chapters, but age trends are highlighted within chapters. We took this approach because, while it is important for teachers to have a snapshot of children at a particular age, it is critically important for teachers to understand where their students have been and where they are going developmentally if they are to promote optimal development in children. In addition, children of the same age in the same classroom can be at remarkably different points in their development.

This textbook is organized into five sections.

1. The first section, "Foundations of Child Development," deals with foundational issues in child development. It introduces key themes in the study of child development and scientific foundations of the field. It discusses key biological topics relevant to teachers.
2. The second section, "The Cognitive Child," deals with major theories and research related to learning and cognition, including memory and problem solving. It models theory application by applying those theories to mathematics education. It also discusses intelligence, academic achievement, and the development of expertise.
3. The third section, "The Emotional Child," deals with attachment, self-control, and emotion regulation in the classroom.
4. The fourth section, "The Social Child," deals with social cognition (e.g., theory of mind, moral judgment, and humor), prosocial and antisocial behavior, conflict resolution, peer interaction, and play.
5. The fifth section, "The Whole Child," highlights the interrelatedness of each of the other domains of the child. Language, literacy, the self-system, and motivation are the result of interactions of biology, cognition, emotions, and social behavior. This section also deals with contexts of child development.

The Content Balance

No textbook can cover all the important topics in child development with adequate thoroughness to please all readers. Trying too hard to please everyone's priorities can result in "inch deep, mile wide" coverage. Weighing what to include and what to leave out is a dilemma for any textbook author. It was particularly challenging for this book. We wanted the length of this textbook to be manageable while offering classroom applications in enough depth to be useful to teachers. We also included teacher-relevant topics that are not in traditional textbooks. Something had to go in order to make room for an emphasis on classroom application.

We opted to forgo discussion of prenatal development and some other topics in order to make room for a chapter on self-control and discipline and more extensive coverage of social–emotional development. Why? Teachers' promotion of social and emotional well-being in students may have a larger effect than the quality of their instruction (Reyes, Brackett, Rivers, White, & Salovey, 2012). Furthermore,

on September 8, 2014, a memorandum was released by the U.S. Administration for Children and Families stating that only 20% of early childhood teachers reported having received training focusing on children's social and emotional development in the past year, although this was a high priority for teachers. Teachers need more information on how to help students behave well and become emotionally and socially well adjusted in the classroom. Thus, while we cannot claim to have covered all the content that every instructor may deem important, this text provides a solid foundation in child development to which you may add your own emphases.

Prospective teachers sometimes see no point in learning theories of development. There are at least two reasons for this. One is that few texts make the connection between theory and practice explicit. The other is that theories are discussed in an opening chapter, divorced from the research that they spawned or the practice that they suggest. To remedy this, we have embedded theories throughout the text. Chapters 3 and 4 provide extensive discussion of learning and cognitive theories that are directly applied to classroom practice. Chapter 12 revisits each of these theories and directly applies them to literacy education. In each of the other chapters, embedded boxes describe theories or theorists that pertain to the topic at hand.

Learning Features of the Text

This textbook has features designed to facilitate learning. The features are based on principles derived from the field of educational psychology.

Consistent Chapter Structure

Chapters have a consistent structure to aid comprehension. Chapters 2 through 14 have the following general structure:

Age Trends in [topic]

Individual Diversity in [topic]

- Stability of individual differences
- What do individual differences predict?
- What predicts individual differences?

Group Diversity in [topic]

Classroom Implications of [topic]

Special Features

In addition, pedagogical features that promote deep processing are included. Features have been kept to a minimum because too many features disrupt readers. The pedagogical features include the following:

- **Think About This** questions are dispersed throughout each chapter in the margins. These ask readers to process and apply content to current issues or personal experience. These questions can be used in small-group discussion, as assignments for short papers, or as Think-Pair-Share class activities.

- **Brain Research Boxes** are dispersed throughout each chapter. These summarize current neuroscience pertinent to the topic.
- **Classroom Vignettes** are embedded throughout the narrative, rather than in margins or boxes, so that reading flow is not disrupted. They are short, authentic examples of children's behavior that illustrate key points and generate interest.
- **Summary of Age Trends** tables occur at the end of chapters. They provide a quick summary of key developmental changes.
- **Reflections on Practice** occur at the end of chapters. They ask teachers to think about how their behavior in the classroom influences children's development. These reflections will be immediately useful to prospective teachers in field placements and to practicing teachers. For readers without field experience, they can be used to prompt reflection on their past experience as a student, and as a reference later when they begin teaching.
- **Theories and Theorists** boxes are embedded in most chapters. These boxes provide a synopsis of influential theorists and theories pertinent to the topic. Instructors vary in whether their course has a theory focus or a child-centered focus. To accommodate both preferences, this feature provides flexibility for you to choose to give particular emphasis to the box, or to gloss over it.
- **Challenges in Development** boxes are embedded in several chapters. This textbook focuses on typical development, but teachers often have students with developmental challenges. These boxes discuss developmental challenges pertinent to the topic of the chapter. Some colleges and universities have separate courses on typical and atypical development, but others do not. Having this information in boxes allows you to either highlight or skip this content.

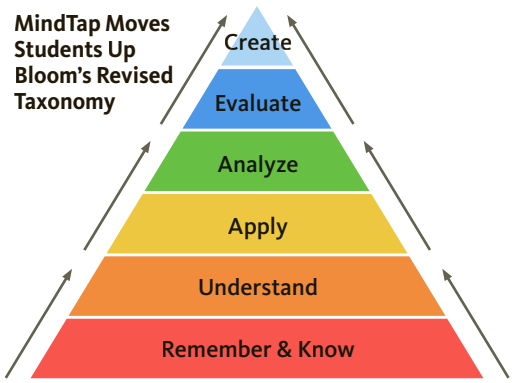
Study Aids

The following study aids are provided in each chapter to facilitate learning:

- A **chapter outline** and **list of learning objectives** are provided at the beginning of each chapter.
- **Key terms** are bolded in the text and defined in the margin.
- Topics in each chapter that are relevant to topics from previous chapters are cross-referenced ("see Chapter X") so that readers **link current topics** with knowledge from previous chapters.
- **Chapter summaries** are provided at the end of each chapter.
- A **glossary** appears at the end of the text and contains all the key terms.

Accompanying Teaching and Learning Supplements

A complete supplements package is available for instructors and students using the text.



Anderson, L. W., & Krathwohl, D. (Eds.). (2001). *A taxonomy for learning, teaching, and assessing: A revision of Bloom's taxonomy of educational objectives.* New York: Longman.

MindTap™: The Personal Learning Experience

In this 3rd edition, we are pleased to provide you with access to MindTap, a highly personalized, fully customizable learning platform with an integrated eportfolio. MindTap is designed to help preservice teachers:

- Know, remember, and understand concepts critical to becoming an effective teacher;
- Apply concepts, create curriculum and tools, and demonstrate competency in key areas in the course, including national and state education standards;
- Prepare artifacts for their portfolio and eventual state licensure, to launch a successful teaching career; and
- Develop the habits of mind of a reflective practitioner.

As preservice teachers move through each chapter's Learning Path, they experience scaffolded learning progressions that move them up Bloom's Taxonomy, from lower- to higher-level thinking skills. The Learning Path promotes their confidence and competence by:

- Engaging them with chapter topics and activating their prior knowledge as they watch authentic classroom videos and then answer questions;
- Checking their comprehension through Did You Get It? assessments, with varied question types that are automatically graded for instant feedback;
- Applying concepts through mini-case scenarios—students analyze typical teaching and learning situations, and then create a reasoned response to the issue(s) presented in the scenario; and
- Reflecting on and justifying the choices they made within the mini-case scenario.

MindTap helps you adjust and improve your instruction through assessment and feedback. You will be able to evaluate how your students plan and teach lessons in ways that make content clear and help diverse students learn. MindTap will help you facilitate deeper learning by:

- Making grades visible in real time through the Student Progress App. You and your students always have access to the data.
- Making national education standards clear, and showing their alignment to student learning activities in the Outcome Library. You can add your state's standards or any other desired outcome to the Outcome Library.
- Generating reports on students' performance with the click of a mouse using any standards or outcomes that are in your MindTap course.
- Allowing you to assess students on state standards or other local outcomes by editing existing or creating your own MindTap activities. Those activities can be aligned to any state or other outcomes that you have added to the MindTap Outcome Library.

MindTap easily integrates into your existing Learning Management System. MindTap is designed to save you time while allowing you to improve your course through fully customizing any aspect of the Learning Path. You can change the order of the student learning activities, hide activities you don't want to use in your course, and—most importantly—create custom assessments and add any standards, outcomes, or content to your course (e.g., YouTube videos, Google docs). Learn more at **www.cengage.com/mindtap**.

Instructor's Manual

The instructor's manual provides **Authentic Case Studies** that address topics across multiple chapters. They allow you to ask your students to interpret the situation and apply content. They can be used for extended discussions or papers. The instructor's manual also provides multiple **Field Observation** activities for each chapter. These ask students to actively connect content to real-world experiences. These activities can be used in field observations, lab sessions, journaling, or small-group discussions. They can be readily adapted to observing family and friends if there is no field component attached to your class. The instructor's manual has additional **"Think About This"** items to facilitate class discussions or assignments. It also lists additional resources with weblinks.

Test Bank

The Test Bank is available electronically or through a computerized testing program called Cognero. Instructors can use the Test Bank to create exams in just minutes by selecting from the existing database of questions, editing questions, or writing original questions.

PowerPoint Lecture Slides

These vibrant, Microsoft PowerPoint lecture slides for each chapter assist you with your lecture, by providing concept coverage using images, figures, and tables directly from the textbook.

Cengage Learning Testing Powered by Cognero

Cognero is a flexible, online system that allows you to do the following: author, edit, and manage test bank content from multiple Cengage Learning solutions; create multiple test versions in an instant; and deliver tests from your LMS, your classroom or wherever you want.

New to This Edition

This 3rd edition has retained the same key strengths of the previous editions—a strong research base with clear guidance on how to apply the research to practice in real classrooms, presented in a well-organized, highly readable style. However, there are some new features and enhancements in this edition.

Thoroughly Updated Research

Over 800 new citations have been incorporated across all chapters. Topics that have been revised and updated incorporating the latest research include the following:

- Chapter 1: Heritability estimates; cultural influences; ethnic group population census data; avoidance of deficit thinking; common risk and protective factors; achievement of poor versus wealthy students; strengths of low-income individuals.
- Chapter 2: Effects of adverse childhood experiences on brain development; music training as a stimulating environment for brain development; motor development in early childhood and markers of motor delays; exercise guidelines and rates of inactivity; rates of obesity among children; effects of obesity on academic achievement; sleep needs by age and rise in sleep deprivation; body dissatisfaction among boys; substance use rates and patterns, including ethnic group differences; low birth weight causes and interventions.
- Chapter 3: Use of applied behavior analysis; outcomes of constructivist instruction; smartphones as cultural tools; teaching in the zone of proximal development.
- Chapter 4: Updated views of the components of executive functions; cognitive flexibility; attention control and classroom implications for teachers on focusing learners' attention; relationship between executive functions and poverty, and their link to the achievement gap; childhood amnesia; scientific thinking in elementary school; computational thinking in secondary school; restructured section on antecedents of reasoning, with more content on classroom implications; updated content on reasoning, particularly the rapidly expanding research on infant reasoning that demonstrates they are better at reasoning than previously thought.
- Chapter 5: Fluid and crystallized intelligence; heritability of intelligence; music and intelligence; boys and spatial ability; biased test items; relationship between assignment of Black students to gifted services who have Black versus non-Black teachers; expert teachers, with new research and examples; high correlation between teacher judgment and performance on standardized achievement tests; gender and achievement; testing effect and how to use it; effects of homework; retention; learning disabilities.
- Chapter 6: Antecedents of attachment reflect new emphasis on autonomy support; interventions for attachment; father–child attachment; mechanisms for the far-reaching effects of attachment; achievement effects of teacher–student relationships; lifespan change in personality; the issue of missing heritability.
- Chapter 7: Use of social media while studying; self-control predicting well-being; strategies for improving self-control; corporal punishment; the Collaborative and Proactive Solutions approach to misbehavior ; ethnic differences in punishment at school; discipline gap; ethnic differences in parenting; collectivist and individualist cultures; child abuse.
- Chapter 8: Streamlined coverage of the functions of emotions; streamlined coverage of depression and anxiety, which strongly co-occur; math anxiety; embarrassment in adolescence; the challenges of military-connected children.

- Chapter 9: Infant and toddler theory of mind (ToM); adolescent ToM; moral identity; infants' sense of fairness; age trends in lying; the moral judgement-behavior gap.
- Chapter 10: Creating prosocial identity in children; infant precursors of aggression; cyberbullying; methods schools can use to reduce bullying.
- Chapter 11: Perceived popularity and why some aggressive children have peer status; aggression as functional; classroom seating arrangements' effect on peer status; social skills training for cooperative learning; support for LGBTQ youth in school.
- Chapter 12: Language development of deaf and hard of hearing children; code switching; academic language; learning from speech alone compared with speech plus gestures; teacher expectation effect; print exposure; handwriting; Twitter as an example of literacy; dyslexia.
- Chapter 13: High quality goals and goal setting; methods of triggering situational interest; the importance of relevance for motivating students; gender differences in self-concept; sex-typed play; goal setting and achievement in elementary and secondary students; autonomy support in the classroom.
- Chapter 14: Geography affects probability of marriage; effects of grandparent divorce on children *and* grandchildren; children of adolescent mothers; children of lesbian mothers; effects of marital conflict; effects of parent involvement; academic socialization; discussion of childcare; educational and non-educational screen media use; video game use and outcomes of use of various media; influence of media use on relational aggression; compulsive use of media; problems with multi-tasking; how to choose educational apps.

Visual Learning Aids

Thirty new figures and tables have been created to convey important concepts visually to readers. Figure captions provide questions to foster reflection and discussion among readers. New figures and tables include:

1. Correlations between Identical (MZ) and Fraternal (DZ) Twins (Chapter 1)
2. Kindergarten Readiness by SES (Chapter 1)
3. Black–White and Rich–Poor Achievement Gap by Year (Chapter 1)
4. Long-Term Outcomes from the Abecedarian Project (Chapter 1)
5. Views of Risky Activities by Age (Chapter 2)
6. Brain Plasticity (Chapter 2)
7. Dietary Guidelines (Chapter 2)
8. Adolescent Sleep Deprivation over Time (Chapter 2)
9. Exercise Promotes Brain Functioning (Chapter 2)
10. Applied Behavior Analysis during Recess (Chapter 3)
11. Teaching in the Zone of Proximal Development (Chapter 3)
12. Cognitive Flexibility by Age (Chapter 4)
13. Individual Differences in Executive Functions (Chapter 4)
14. Memory Improves with Age (Chapter 4)

15. Schooling Improves Children's Thinking (Chapter 4)
16. Visual–Spatial Play Builds Math Skills (Chapter 4)
17. Variation in Intelligence Explained by Genes and Environment (Chapter 5)
18. Flynn Effect on IQ (Chapter 5)
19. TIMSS Science Performance of Fourth Grade Students (Chapter 5)
20. Attachment and Responsiveness to New Anger-Prone Playmates (Chapter 6)
21. Teacher–Student Relationship Combines with Personality to Predict Misbehavior (Chapter 6)
22. Out-of-School Suspension Rates by Group (Chapter 7)
23. Teachers' Responses to Misbehavior of Black and White Male Students (Chapter 7)
24. Age Trends in Embarrassment (Chapter 8)
25. Math Anxiety and Performance (Chapter 8)
26. Theory of Mind Test for Adolescents and Adults (Chapter 9)
27. Toddlers Have a Sense of Fairness (Chapter 9)
28. Age Trends in Lying (Chapter 9)
29. Children Want to "Be a Helper" (Chapter 10)
30. School Climate Predicts Bullying (Chapter 10)
31. Relationship of Pseudomaturity to Popularity in Adolescence (Chapter 11)
32. Supportive Teachers Buffer the Effects of Rejection (Chapter 11)
33. Gesture Helps a Child Understand Equivalency (Chapter 12)
34. Gesture Facilitates Learning (Chapter 12)
35. Average Annual Gain in Reading and Math Competence from Kindergarten to Grade 12 (Chapter 12)
36. Average Words per Minute Read across 2nd to 12th Grade (Chapter 12)
37. Gender Differences in Self-Concept for Six Domains (Chapter 13)
38. Goal Setting and Achievement (Chapter 13)
39. Form used by a Sixth-Grade Teacher to Help her Learners Set Geometry Goals (Chapter 13)
40. Math and Reaching Achievement for Children of Adolescent and Adult Mothers (Chapter 14)
41. Divorce Rate by Education Level (Chapter 14)
42. Social Media Used by Adolescents (Chapter 14)
43. Alcohol and Mature Video Game Use (Chapter 14)
44. Gender Differences in Media Use (Chapter 14)

Alignment with National Standards and Licensure Exam

Alignments of topics with InTASC and NAEYC standards are provided in a Standards Correlation Grid on the inside front and back covers. This allows you to quickly locate coverage of standards and licensure exam guidelines throughout the text.

Acknowledgments

All the vignettes describing children's behavior in this text are real classroom experiences. They are based on our own observations and on narratives written by students and colleagues. It is customary to acknowledge the author of any narrative, including informal portrayals such as the vignettes used in this text, immediately adjacent to the narrative. However, in the interest of a higher ethical purpose—that of protecting the privacy of children, teachers, and schools—we have chosen instead to list our sources here (in alphabetical order):

Alison Ausmus, Kevin Bishop, Carolyn Boswell, Russ Crane, Jerry Crosby, Brittany Dickman, Amy DeBacker, Nora Duffy, Katie Hams, Jennifer Greenway, Todd Gutschow, Stan Hernacki, Bethany Hintz, J.D. Hunter, Jennifer Kurt, Michelle Long, Clarissa Montz, Leah Morgan, Michael Norman, Kathleen O'Toole, Vashanti Rahaman, Dorothy Rohde-Collins, Gwen Roush, Emily Simon, Barbara Zimmerman

We have used false names in all the vignettes. We have also taken the liberty to adapt the narratives to fit the purpose of the chapter, or to shorten them because of space limitations. We express our gratitude for the narratives that each of these keen child-observers has contributed in order to help the next generation of teachers understand their students.

A number of reviewers offered excellent guidance and made key contributions to the organization and content of this text along the way. Special thanks to Nelson Cowan for advice on Chapter 4 and to the following reviewers:

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chapter 1

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Ways of Thinking about Children

What factors have made you who you are today? Does your answer emphasize genes or experiences in your family, school, or culture? Did these factors make you similar or different from others your age? In this chapter, we will discuss how research helps answer questions like these. **After you read this chapter, you will be able to:**

1-1 Describe methods of scientific research in child development.

1-2 Recognize how genes and the environment interact to influence development.

1-3 Recognize risk factors and foster protective factors that influence development.

1-4 Use risk and protective factors to analyze the effects of preschool.

1-1 The Science of Child Development

An 18-month-old boy is left at preschool. When his mother returns, he runs to her and wants to be picked up. She picks him up briefly and puts him down. He cries and clamors to be picked up. She turns from him. He cries strongly. She intentionally refuses to pick him up because she says she doesn't want him to be too dependent on her, "Him being a boy and all." She doesn't want him to get "funny" by having to feel secure. She says she thinks he might "go gay" if she spoils him. (Adapted from Smyke, 1997)

toddler
a child between 1 and 3 years of age; so-called because of recent mastery of walking, often with a wobbly gait.

You may be amused or outraged by this mother's view of what causes overdependency and homosexuality. Do you believe that feeling secure is bad for **toddlers**? Can you "spoil" a child by picking him up when he cries? Your belief about how a crying toddler should be handled is your personal theory. Throughout this text you will learn about formal, research-based theories of child development that will help make your personal theories clearer to you and challenge the accuracy of some, so that you can provide the best possible classroom for your students.

Theories are developed from careful, systematic study as scientists seek to discover basic principles of child development. You might ask, "Are there general principles? Isn't each child unique?" While each child is unique, there are still principles of development that apply across children. What might these be? The answer depends on your theory of child development.

1-1a Child Development Theories: A Brief Overview

theory
an organized group of concepts or principles used to explain a particular aspect of human development.

A **theory** of development is simply an organized group of principles used to explain some aspect of children's development. Theories help you interpret what you observe in children, and suggest the best way to promote their development. In later chapters, you will be introduced to major theories of child development and some of their most influential proponents. To get started, we present here a brief overview of these theories.

Views of child development have changed over time. In the early 1900s, for example, many psychologists believed that children are genetically endowed with abilities that just need to unfold as children mature (Collins, 2002). Believers in this maturation perspective thought that how children change across time is genetically determined for all children, regardless of their different experiences.

Other psychologists are environmentalists who emphasize the role of the environment and claim that children's development is driven by experience within the family and culture. Early environmentalists tended to see children as relatively *passive* as they received influence from their environment, like clay being molded in the hands of an artist. A new view arose that recognized that children *actively* contribute to their own development by the way they think about their experiences. Jean Piaget, a key figure we will discuss in Chapter 3, was a primary proponent of this view.

Table 1.1 gives a simplified overview of contemporary theories. These theories differ in their view of what drives children's development. Some theories give greater emphasis to maturation (i.e., nature) as a cause of behavior and others to the environment (i.e., nurture). These theories also differ in what aspect of child development they

TABLE 1.1 Overview of major theories of child development

Theory and major theorist	Basic aim	Emphasis: general age trends for all children versus how individuals are different	Forces that drive development	Emphasis: nature or nurture?	Domains of development the theory explains well
Bioecological Model Urie Bronfenbrenner (Chapters 1 & 14)	To highlight the multiple layers of influence on the child	Both	Heredity and environment act together to influence development. Does not specify particular processes.	Both	Any
Ethology Konrad Lorenz and Nikolaas Tinbergen (Chapter 6)	To understand the functions of behavior in different species	Focuses on species-wide age trends, but not individual differences.	Genetically based processes shaped by evolution drive development. Behavior becomes incorporated into the biology of a species because it promotes breeding success. Compares human and animal behavior. Emphasis is on innate behaviors.	Nature	Attachment Emotions Aggression Language
Behaviorism B. F. Skinner (Chapters 3 & 7)	To explain learned behavior	Focuses on individual differences, which are the result of different histories of reinforcement.	The child is passive; reinforcement and punishment drive development. Behaviors that are reinforced are more likely to reoccur. Emphasis is on observable behavior. Concepts of mind, cognition, and inner experiences are ignored. Useful for managing children's behavior problems.	Nurture	Any learned behavior. Does not explain innate behaviors, like smiling, or why some things are reinforcing.
Social Cognitive (or Social Learning) Theory Albert Bandura (Chapters 3 & 13)	To explain acquisition of behavior and cognitions such as attitudes	Greater emphasis on individual differences, especially on behavior and attitude change, not age trends.	An expansion of behaviorism/learning theory. Children learn from models or others who are reinforced. This requires children to remember and interpret things they have observed—which means cognition is involved. The child actively interprets reinforcement.	Nurture	Any learned behavior

(*continued*)

TABLE 1.1 Overview of major theories of child development (continued)

Theory and major theorist	Basic aim	Emphasis: general age trends for all children versus how individuals are different	Forces that drive development	Emphasis: nature or nurture?	Domains of development the theory explains well
Cognitive Developmental Theory Jean Piaget (Chapter 3)	To explain the development of logical thought and moral judgment	Age trends are strongly emphasized and age-based "stages" of cognitive development are outlined.	Innate cognitive maturation (with some social interaction) drives development. Children actively "construct" their own knowledge through exploration. Abilities are similar, even with different cultural experience. Maturation limits logical reasoning ability, so children's cognitive development is stage-like.	Nature Maturation (with some environmental influences)	Knowledge Logical reasoning
Sociocultural Theory Lev Vygotsky (Chapter 3)	To explain acquisition of knowledge and language ability	Age trends are not emphasized. Individual differences are a result of unique social experiences.	Development occurs through interaction with others. Cognitive growth is collaborative (not within the child). The child's thought is the result of internalizing dialogue with others. Development cannot be separated from social and cultural interaction.	Nurture	Knowledge Culturally valued skills Language
Information Processing Various theorists (Chapter 4) **Social Information Processing** Kenneth Dodge (Chapter 11)	The step-by-step processing of information	Age trends are the result of faster and more efficient processing. Individual differences are the result of innate capacity and experience (i.e., prior knowledge).	Like a computer, the child receives sensory input, manipulates information, and then responds with output. This view focuses predominantly on what is happening inside the child's mind, but includes input from the environment. What is studied is narrow (i.e., logical flow of information). Useful for targeting interventions for specific processing problems.	Both	Problem solving Memory Decision making Attention Aggression
Psychodynamic Sigmund Freud (Chapter 9)	To explain personality and neurosis	Age trends are emphasized with age-based "stages" of psychosexual development. Individual differences in personality are the result of early parent–child interaction.	How parents gratify (vs. frustrate) biologically based drives influences personality. Children can become fixated at a particular stage. A newer version, the neo-psychoanalytic view, asserts that the goal of behavior is to regulate and maintain internal and interactional harmony with others. Early parent–child interaction is internalized and influences later experience. Emphasizes the unseen workings of the mind.	Both	Personality Attachment Emotions Morality Humor The unconscious

seek to explain and whether they see children as active or passive contributors to their own development. Spend a few minutes examining this table to compare the theories, but do not try to memorize them. We will discuss each theory in greater detail in later chapters. Revisit the table for a review when you finish the text.

Theories are important to teachers because they guide decisions about classroom practices and because they guide research. Indeed, all of your behavior as a teacher is based upon your own theory of instruction. If you believe children learn best by imitating an expert, your theory is different from someone who believes children learn best by trying things out on their own. In developmental science, research results are used to test and improve theories. In the next section, we explain the research methods on which formal child development theories are based.

1-1b Research Methods

Why does a teacher need to know research methods? Federal mandates require educators to use "scientifically based research" to guide decisions about how to teach. To help, the federal Department of Education maintains a *What Works Clearinghouse* website. Imagine that you are a preschool teacher and want to try a new reading program to help a bilingual student learn to read, or you might be a high school teacher looking for a curriculum to help struggling teen readers. Imagine you are on a committee looking for a bullying prevention program for your school. In any of these roles, you could search the clearinghouse for a program. It would tell you if there was research on the program, the caliber of the research, and the effectiveness of the program. In this section, we will introduce you to basics of research methods so that you can learn to assess the quality of research, a professional skill that is now important for teachers. To begin, let's look at the three basic research designs—experimental, nonexperimental, and qualitative designs.

Experimental Designs

While people commonly use the term *experiment* to refer to any kind of research, for psychologists the term has a very specific meaning. In a simple experiment, you change something in the learner's environment and measure the results. For example, a teacher could try a different phonics approach to see if students learn to read more easily. Such informal experiments can be useful, but cannot pinpoint the cause of an outcome like improved reading skills. To determine the *cause* of outcomes, scientists use controlled **experiments**.

experiment
a controlled study comparing outcomes between people randomly assigned to a treatment group and to a control group.

In a controlled experiment, learners are placed in at least two groups: an intervention group or a **control group**. The intervention group gets a special treatment, but the control group does not. Outcomes for the two groups are compared. For example, to determine whether a phonics program results in better reading skills, you could place half of your 1st-graders in a phonics program and the other half in a different program. If learners in the phonics program develop better reading skills compared to the control group, you have evidence (not proof) that the phonics program might work.

control group
in an experiment, the group that does not receive the special treatment in order to provide a comparison group.

However, what if the learners in the phonics program were "smarter" or already had better skills than the control group? For an experiment to demonstrate cause-and-effect—that the intervention and not something else *caused* an outcome like improved reading skills—the control group should be similar to the intervention

random assignment
each research participant has an equal chance of being assigned to the treatment or control group.

group in all attributes. To increase the probability that groups are similar, researchers use **random assignment**. This means each learner has an equal chance of being put in the intervention group or the control group. Even with random assignment, you might conclude that a phonics program is *more likely* to produce literate children, but not that the phonics program makes *all* children literate. Thus, research is about probability, not certainty.

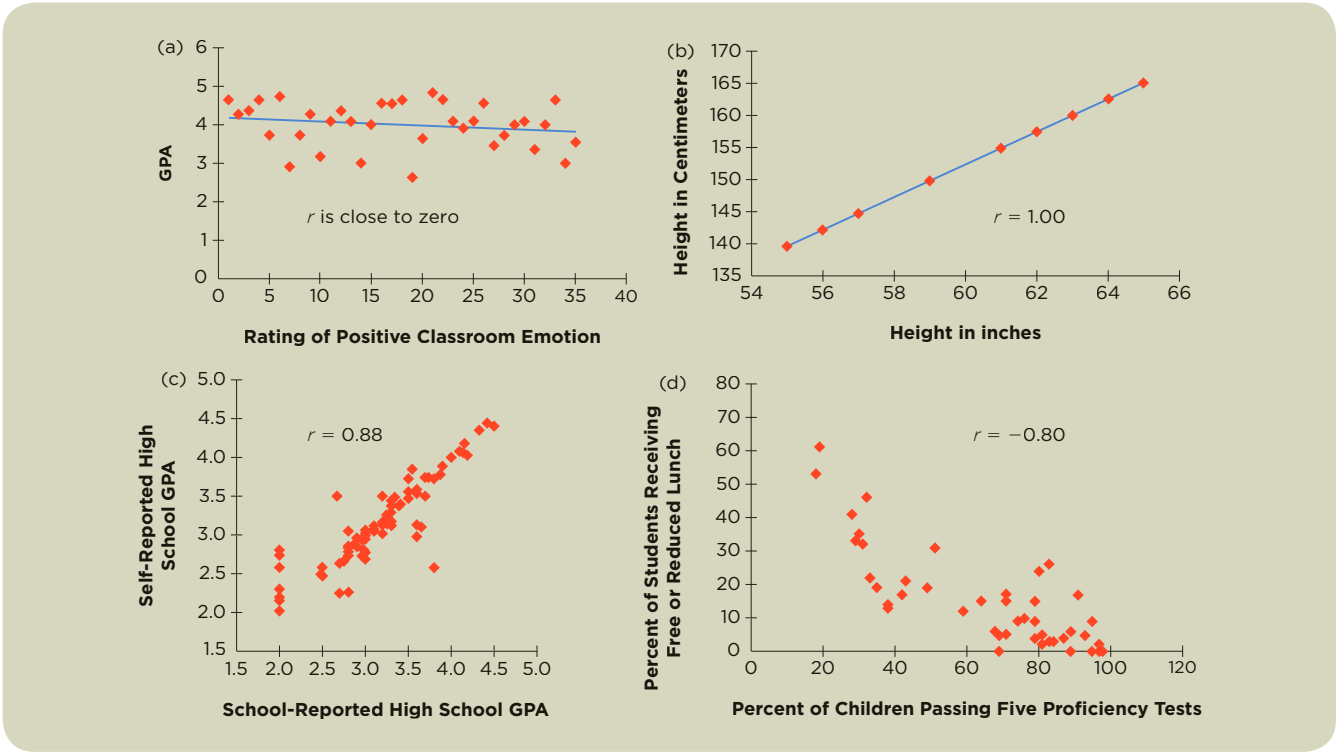
Nonexperimental Correlational Designs

Experiments cannot always be used because they may be unethical or impractical. For example, if you want to understand the effect of prenatal alcohol exposure on children, it would not be ethical to randomly assign some pregnant mothers to drink five beers a day and other mothers to drink none. In a case like this, nonexperimental correlational research designs are used in which researchers measure variables as they naturally occur, without intervention. (A *variable* is an attribute of the child or environment that can be measured, like number of ounces of alcohol per day.) Researchers might, for example, measure how much mothers drank during their pregnancies and compare that to their children's reading ability to determine whether the two variables are related.

correlation coefficient
a statistic that measures the relationship between two variables.

A correlation is a measure of the relationship between two variables. The **correlation coefficient**, or *r*, indicates the statistical strength of the relationship. A perfect positive correlation, or $r = +1.00$, means that a plot of the variables follows a straight line (see Figure 1.1). That is, if you know a value for one variable, you

FIGURE 1.1 Correlation Coefficients.



If you covered up the "*r*" statistic, could you guess it approximately? Explain correlation to a friend, and then test him or her.

can predict with perfect accuracy the corresponding value for the other variable. A *positive* correlation means that higher values on one variable go with higher values on the other. For example, *higher* levels of fathers' education predict *higher* levels of children's reading ability. If there is a perfect negative correlation, then $r = -1.00$. A *negative* correlation means that higher values on one variable go with lower values on the other. For example, *higher* levels of prenatal alcohol exposure predict *lower* levels of children's reading ability. Strong correlations can be either positive (e.g., +0.60) or negative (e.g., −0.60). If there is no association between the variables, then $r = 0$. Correlation coefficients *are not percentages*; a correlation of 0.40 does *not* mean 40% of anything.

Correlations between any two variables in child development research are rarely close to 1.00. In fact, very few are even as large as 0.50, and a correlation of 0.35 is considered large enough to draw attention. This is because important child outcomes are influenced by many variables—not just the one being measured in a study. For example, good reading ability is not the result of a single variable, like intelligence, involved parents, or effective schools. Rather, each of these variables (and many others) combines to influence reading ability.

think about this

In a study of children adopted from Romanian orphanages, the longer the time spent in the orphanage before being adopted, the lower the cognitive ability (O'Connor et al., 2000). Would this be a positive or negative *r*? How would you graph this?

Qualitative Designs

In experiments and correlational studies, scientists apply *numbers* to variables, such as fathers' education and children's reading ability, and then use statistics to analyze their relationship. This is a quantitative approach. In contrast, **qualitative research** involves interviews, observations of natural behavior, and other forms of data that are usually reported in words rather than numbers. The researcher may spend anywhere from hours to years observing and interacting with youth in order to accurately tell their story. For example, in one study researchers investigated the emotions that students felt—especially pride—as they developed understanding of science concepts (Bellocchi & Ritchie, 2015). Another study investigated how kindergarten students thought that being "smart" meant obeying teachers (Hatt, 2012). Qualitative studies like these can provide rich insight into learners' thoughts and behavior not captured in quantitative designs.

qualitative research
nonquantitative research characterized by the researcher being the instrument of data collection (rather than a test or questionnaire). May involve observations and interviews as data.

Studies of Change over Time

Imagine you want to know how children's aggression changes with age. You could follow one group of children for 12 years, assessing the *same* children at ages 4, 10, and 16. This is a **longitudinal research design**. What if you can't wait for 12 years? You could assess groups of 4-, 10-, and 16-year-olds at one time, which would not really study change over time, but would suggest whether children of different ages differ in their aggression. This is a **cross-sectional research design**. A cross-sectional design gathers data from different age groups at one point in time, and a longitudinal design gathers data from one group over multiple points in time.

Each research design has strengths and limitations. For example, longitudinal studies allow you to identify factors that might improve children's lives over time. However, they take a long time before results are available, and it is difficult to keep children involved over multiple years. Experiments can establish what causes a particular outcome; however, sometimes they are not ethical or practical, so

longitudinal research design
data are collected from the same individuals two or more times, separated by some period of time (e.g., months or years).

cross-sectional research design
data are collected at one point in time from two or more age groups to investigate age trends.

correlational designs are used instead. Qualitative studies provide rich descriptions and deep insight into a small group of young people's lives, but may not generalize to most other youth. Because each design has limitations, a mature field of science uses multiple designs.

In addition to the design of research, there are four other key issues to understand when you read research findings: (1) causality, (2) measurement, (3) generalizability, and (4) effect size. We'll discuss these next.

Causality

Most studies of child development are correlational. Therefore, it is important to understand their critical weakness: they cannot demonstrate that one variable causes another variable. If variables A and B are correlated, A could cause B, or B could cause A, or both could cause each other, or C could cause both A and B. For example: (1) hostile mothers could cause hostile children; (2) hostile children could cause hostile mothers; (3) the variables could be **bidirectional**, meaning that hostile children and hostile mothers influence each other; or (4) a third variable, like hostile fathers or a genetic predisposition to be hostile, could cause both children's and mothers' hostility.

bidirectional
variable A influences variable B, while B also influences A.

It is common for people to mistakenly assume causality from correlational studies. For example, years ago, research found that as they read, poor readers make more erratic eye movements than good readers. Interventions using special equipment and specially trained teachers attempted to teach poor readers improved eye movements (Stanovich, 1992). Later it was found that erratic eye movements do not cause poor reading, but rather poor reading causes erratic eye movements because poor readers have trouble recognizing words and understanding their meaning. Millions of dollars were wasted on special interventions. The critical lesson is that you cannot assume causation from correlational studies, although such studies can tell you the size of the relationship between two variables. As a teacher, you will probably be asked to help choose a curriculum or program for your school, so be prepared to think about what kind of evidence you would need to justify your selection. The What Works Clearinghouse gives precedence to controlled experiments over correlational studies because policy makers are usually interested in whether programs *cause* specific outcomes. When scientists use terms such as *predict*, *linked*, *correlated*, and *associated*, they are usually referring to correlational studies. Watch for these terms throughout this text.

Measurement

Researchers measure development in many ways: observations of behavior, ratings by a teacher or parent, self-report, and physiological markers such as level of hormones or brain images. Each form of measurement has weaknesses and strengths. For example, self-report (when respondents tell you what they think or fill out a survey) allows you to get inside the minds of those who respond, but children and youth can be biased, have trouble communicating, or misunderstand questions. Direct observations by researchers may be more objective, but they are costly, may not capture rare but important behaviors such as fights in school, and can change behavior because of the observer's presence. If learners are observed in an artificial, controlled setting, results may not apply to real-world settings. Parent or teacher questionnaires are inexpensive and easy to administer, but they can be biased and

may be different from youths' self-reports. Again, a mature field of science uses multiple methods to compensate for the weaknesses of any single method.

Reliability and validity are two ways of describing how "good" a measure is. **Validity** refers to the accuracy of a test or measurement: does it really measure what it claims to measure? The validity of a measure depends on the purpose for which it is used. For example, a proficiency test might be valid for deciding whether students are mastering grade-level content, but not for deciding which students would benefit from special education.

validity
the extent to which a measurement assesses what it is supposed to measure for a specific purpose.

Reliability refers to the consistency of a test or measurement. A reliable measure yields nearly the same results across time, so that you get about the same results today as next week. A reliable measure also yields the same results if administered by two different teachers under the same conditions. Short tests tend to be less reliable, so when you design a test, it is better to use 20 items than 10 items. A test cannot be valid if it is not reliable.

reliability
consistency of a test or measurement.

Validity and reliability are important because many decisions are made on the basis of measures. Such decisions include who receives special education services, who gets into which colleges, and what instructional strategy you use with a particular child. You should always ask whether a test is valid and reliable. For example, are IQ tests valid for selecting gifted students? Are readiness tests valid for deciding who is ready for kindergarten? Are your classroom tests valid and reliable enough to use for assigning grades?

Generalizability

It is not possible to include all learners in a study. Instead, a sample or subgroup is studied with the intent of generalizing the results to a larger group. When samples of learners are carefully selected to represent larger groups, research results should apply to other learners in the larger group. In the past, most research focused on White, middle-class learners. It was not clear if these results could be generalized to other learners. In recent decades, researchers have been careful to sample low-income learners, learners of color, and learners outside North America so that results are more generalizable (Hagen, 2007).

One factor that limits generalizability is the **cohort effect**. A cohort is a group of children born about the same time who experience unique political, economic, and social trends. You are a member of a cohort. A cohort effect, also called a *generation effect*, is an outcome caused by the particular era in which the cohort grows up. Some cohorts are labeled, like Baby Boomers and Millennials. There are cohort effects for intelligence (Chapter 5), personality (Chapter 6), and aggression (Chapter 10). That is, today's children on the average have higher intelligence, but they are more anxious, neurotic, and aggressive than past generations. Research conducted on one cohort might not generalize to a different cohort.

cohort effect
an effect upon development whose cause is specific to the particular time period in which the cohort grew up.

Effect Size

The concept of effect size has become increasingly important for teachers because of recent emphasis on raising test scores and using evidence-based curricula. **Effect size** is a measure of the strength of the relationship between two variables, or how much more effective one intervention is than another. The What Works Clearinghouse website reports the effect size of interventions to help you make decisions about your

Effect size
a measure of the strength of the relationship between two variables, or the size of the difference between the treatment and control group.