Preface

Adolescent development is fascinating yet frequently misunderstood and often stereotyped, posing unique opportunities and challenges for instructors. All undergraduate students have been—or are currently—adolescents, and they have observed and experienced many of the topics we discuss. Students' personal examples are fun and engaging but sometimes puzzling when they don't match the theoretical and research conclusions we discuss. How do we reconcile the differences? In class and this text, I adopt a contextual perspective to help students understand variability in development and make sense of the growing body of findings in adolescent development. I began teaching adolescent development three decades ago at a small regional comprehensive university. I've since interacted with thousands of students in more than 100 course sections. *Adolescence in Context* is the result of my in-class and out-of-class discussions with my students about the nature of adolescent development. In writing this text, I aim to explain the sophisticated interactions that constitute development comprehensively yet concisely.

Themes: Context and Application

Adolescence in Context focuses on three key themes for understanding adolescent development: the centrality of context, the applied value of developmental science, and the relevance of intersectionality for understanding development. These themes are highlighted throughout the text and in the critical thinking features. An accessible writing style helps students grasp these complex issues, and the text is firmly grounded in classic and cutting-edge science.

Contextual Perspective

The most central tenet of development is that it occurs in context. It results from dynamic transactions among individuals, their physical, cognitive, and socioemotional capacities, and the web of interacting contexts in which they are immersed, including family, peers, school, neighborhood, society, culture, and history. *Adolescence in Context* discusses these processes, emphasizing how individual factors combine with the people, places, circumstances, and time in which we live to influence development. A contextual approach can provide the backstory to development and help us understand why people vary.

This contextual theme is infused throughout the text and highlighted in critical thinking questions at the end of each section. *Thinking in Context* items ask students to consider a range of developmental issues, including the impact of biological factors, applying developmental theory and themes, applying Bronfenbrenner's bioecological theory to address real-world problems, and the role of culture in development. *Thinking in Context* items also highlight how race, ethnicity, gender, and socioeconomic status (SES) overlap to determine developmental opportunities and outcomes.

Applied Emphasis

The field of developmental science is unique because so much of its content has immediate relevance to our daily lives. Students may wonder: Is social media harmful? Are adolescents moody? Does peer pressure exist? How does alcohol and substance use affect the brain? What does it mean to identify as transgender? Developmental science is increasingly applied to influence social policy. For example, should social media have age restrictions? Can we outlaw bullying? How can we reduce school dropout rates? Do prevention programs work? Developmental science can inform our understanding of each of these topics. Moreover, these topics fascinate students because they illustrate clear-cut examples of why developmental science matters.

Application is integrated throughout the text, including *Apply* items that ask students to apply the course content to mini-cases, generate examples, and explain the material to different audiences.

Intersectionality and Development

A contextual and applied perspective highlights the role of intersectionality in development. Diverse identities and experiences accompany race, ethnicity, gender, sexual orientation, SES, and other social category memberships—and these differences influence adolescent development. Inequities are experienced as racism, sexism, classism, heterosexism, and more, and they shape children's, adolescents', and families' lived experiences, opportunities, and developmental outcomes. Until recently, people of color have either been excluded from research studies or grouped as "minorities," masking differences and contributing to a sense of invisibility among people of color. I examine development through an intersectional lens whenever possible.

Examples of content examining racial, ethnic, gender, sexual orientation, and SES differences and interactions include the following:

- Adolescents' physical development and health, such as socioeconomic influences on brain development and health, including growth, activity, nutrition, injuries and mortality, as well as COVID-19 experiences and outcomes. Persistent problems such as food insecurity and exposure to stress and trauma influence brain development, stress reactivity, and pubertal timing and play roles in mental health, including rates of eating disorders, depression, and suicide.
- Cognitive development, such as diagnoses of neurodevelopmental disabilities, individual differences in intelligence scores, and gene-IQ correlations.
- Socioemotional development, such as emotional regulation and the sense of self, including self-concept, self-esteem, and identity. Ethnic-racial identity is a major heading in Chapter 5, including adolescents' understanding of race, ethnic socialization, experiences with discrimination, and overall adjustment. Transgender and gender-diverse identity is a major heading in Chapter 6, which examines gender diversity from childhood into adolescence, influences on adjustment, and gender-affirming care as well as developmental transitions, risks, and supports for LGBTQ+ adolescents.
- Adolescents' social contexts, including family formations—such as one-parent, cohabitating, adoptive, and foster families—parenting styles, and the effects of different family experiences—such as parental incarceration, parental deployment, and immigration. Contextual stressors that vary with intersectional factors include exposure to early life stress, neighborhood and community violence, war and terror, and experiences during the COVID-19 pandemic.

Current and Classic Research

Adolescent Development in Context integrates recently published and classic findings. Rather than present an exhaustive review of current work simply for the sake of including recent references, I carefully select the most relevant findings. I integrate cutting-edge and classic research to present a unified story of what is currently known about adolescent development.

Accessible Writing Style

Having taught undergraduate students at a regional public university for 30 years, I write in a style intended to engage diverse readers like my own students. Unlike many textbook authors, I teach four classes each semester. I taught my first online course in 2002, well before the COVID-19 pandemic. My daily exposure to multiple classes and many students helps keep me grounded in college students' ever-changing concerns and interests. I attempt to write in the same voice as I teach, carefully structuring sections to build explanations and integrating content with examples that are relevant to students.

My institution is embedded in a diverse community in which about 40 languages are spoken. My students are similarly diverse in background, race, ethnicity, and SES. Some live on campus, but at least three-quarters of my students commute. Most of my students are 18–24, but my classes include many adults over 24. Many are veterans, a rapidly increasing population at my institution with unique perspectives and needs.

My experience teaching 12 courses during the COVID-19 pandemic in the spring of 2020 and the 2020–2021 academic year reinforced (for me) the importance of accessible, concise textbooks. Like many faculty, I was able to record only so many videos for my asynchronous classes, so I relied heavily on my text, asynchronous discussion posts, and for the classes where available, Vantage, which enabled students to read the text interactively. Accessible and engaging course materials can make a difference in students' learning despite difficult circumstances.

Pedagogical Features

Each year, I teach two to four sections of adolescent development. I regularly use my text in class, and students' responses, learning, and especially their questions guide my writing. I use the following pedagogical elements of *Adolescence in Context* in my classes and modify them based on my experiences.

Review, Think in Context, and Apply

The scholarship of teaching and learning has shown that students learn best when they manipulate information and consider it at multiple levels. Metacognition is challenging, and students are often unaware of what they don't know. This is particularly true for students of adolescent development. Everyone has some experience as an adolescent, which can make it difficult to assess their knowledge objectively. Several types of questions, designed to target different levels of analysis, appear at the end of each section in each chapter.

- ***Review*** items assess the lower levels of Bloom's taxonomy (recalling and explaining concepts).
- ***Thinking in Context*** items ask students to consider the role of context in the topic as well as reflect on their experience. For example, readers might identify examples of Bronfenbrenner's bioecological systems and apply the perspective to a problem, consider how findings might vary with SES or other demographic factors, or discuss the role of intersectionality in development. *Thinking in Context* items are organized to assess the higher levels of Bloom's taxonomy (e.g., apply, analyze, and evaluate). These items also allow students to reflect on how the content compares with their experience. Students find reflection items engaging (e.g., to what extent was your adolescence stormy and stressful?), and such items offer powerful opportunities for students to engage with the material.
- ***Apply*** items typically provide a short scenario involving adolescents and ask readers to provide insight and solve a problem.

Learning Objectives and Summaries

Core learning objectives are listed at the beginning of each chapter. The end-of-chapter summary returns to each learning objective, recapping the key concepts presented in the chapter related to that objective

What's New in *Adolescence in Context* 2e

My main goals in writing this second edition were to increase the coverage of context, integrate current research with classic work, and where possible, examine development through an intersectional lens. The second edition includes about 1,600 references published since 2020, including about 450 published from 2023 to 2025. A new section of Chapter 1 defines intersectionality and its value for

understanding development. The developmental science literature on intersectionality is in its infancy but rapidly growing. I include information about the interrelations of ethnicity, race, gender, sexuality, SES, and more, as available.

Next, I list some major revisions reflected in this second edition of *Adolescence in Context.* Each chapter contains many other changes that are not documented here. I hope this volume will improve instructors' and students' experiences in and out of class—and that students will be inspired to apply the findings of developmental science to their lives.

In addition to updating references and research, examples of changes include the following:

- Chapter 1 was reorganized and largely rewritten into two chapters. New sections in Chapter 1 include introductory material defining adolescence and why it should be studied, adolescence as culturally constructed, a global view of adolescence, and the role of sociohistorical context in development, including generations and how experiences during adolescence often mark generations. Biology–context interactions are discussed in a new section that includes gene–environment interactions and epigenetics.
- Chapter 2 is new and contains expanded overviews of theory and research. New sections include an examination of core developmental issues, dynamic systems theory, and behaviorist theory. Discussions of theory and research ethics were reorganized and expanded.
- Chapter 3 was reorganized, and sections on the effects of pubertal timing were collapsed into a discussion of the psychological effects of puberty. New sections include the epigenetics of puberty, body image, and cross-cultural rituals associated with puberty. The section on eating disorders was moved to Chapter 13.
- Ine Chapter 4 new sections discuss gray and white matter changes, the social brain, Vygotsky, theory of mind, perspective taking, and decision-making. New sections examine whether intelligence is one ability or many as well as SES and stereotypes as influences on IQ.
- Chapter 5 includes an expanded discussion of self-concept, including its multidimensionality as well as brain development and self-concept. New sections examine emotional experience and regulation, developing an understanding of race, and experiences that influence ethnic-racial identity.
- Chapter 6 was reorganized to include updated sections examining gender terminology and contextual influences on gender, such as parents, peers, school, media, and culture. Transgender and gender-diverse adolescents are discussed in a new section. Updated information was added about gender-diverse adolescents, including contextual influences on adjustment and research on gender-affirming care.
- Chapter 7 was reorganized to include new sections on the challenges of studying sexuality in adolescents and those that arise when studying gender- and sexually diverse teens. LGBTQ+ adolescents are discussed in a new section header. Other new sections include how sexual activity progresses from handholding and affirmative sexual consent.
- Chapter 8 includes a new major section on modern theories of moral development, covering social domain theory, dual process theory, social intuitionist theory, and moral identity. Discussion of influences on prosocial development was expanded along with new material on home, peer, and biological influences. There is a new section on critical consciousness.
- Chapter 9 includes updated and expanded discussions of the family system, siblings, and attachment and a new section on only children. A new section was added on adolescents and families at risk, which includes sections on parental deployment, parental incarceration, and there are revised sections on foster care and undocumented families in addition to a new section examining the effects of COVID-19 on adolescents, families, and racial disparities in effects.

- Chapter 10 includes new sections on attachment and intimacy, expanded discussion of peer victimization, including cyberbullying, and expanded discussion of peer influence, including social context, peer status, and individual differences. Dating violence was expanded to reflect sex differences, the experiences of LGBTQ+ youth, and interventions.
- Chapter 11 includes an expanded discussion of achievement motivation to include mindset and goals and an expanded discussion of mastery versus helpless orientation, parent praise, and stage environment fit, including connections with teachers and racial and ethnic differences. The discussion of schools has new sections on tracking, leadership, instruction, neighborhoods, and disability, and it has been expanded to discuss context and racial ethnic differences. There is also a new section on giftedness and updated research on adolescent employment,, first-generation students, and an expanded discussion of the effects of attending college on development.
- Chapter 12 includes an expanded discussion of theories and a new section on developmental perspectives and theories, such as co-construction theory, updated information about screen violence and sexual media, and a new section on pornography and adolescent development. A new section was added on problematic media use covering sexting, internet gaming disorder, and problematic social media use. There are also new sections including social media and adolescent development, discussions of types of social media use, adolescents' views of social media, social media and mental health, positive development, and social policy and recommendations on social media.
- Chapter 13 includes a new opening section that frames the discussion by distinguishing two types of problematic outcomes and examining risk and resilience. A new section examines anxiety. The section on eating disorders was moved from Chapter 2 and updated to include current data, including the effects of the COVID-19 pandemic. The section on depression was updated with risk factors and COVID-19 effects. The alcohol and substance use discussion includes a new section on the adolescent brain. There is also a new section on positive youth development, with the five Cs model, the 40 developmental assets framework, social emotional learning, and positive youth development interventions.

Organization

Adolescence in Context is organized into 13 topical chapters covered in four parts that examine the biological, cognitive, and socioemotional changes that occur during adolescence and the contexts in which adolescents are embedded. Part 1 covers biological and cognitive foundations of development with an introduction to adolescent development (Chapter 1), an overview of theories and research methods (Chapter 2), biological development (Chapter 3), and cognitive development (Chapter 4). Part 2 examines psychosocial and socioemotional development with chapters on identity (Chapter 5), gender (Chapter 6), sexuality (Chapter 7), and morality, religion, and values (Chapter 8). Part 3 explores contexts of development: family (Chapter 9), peer (Chapter 10), school and work (Chapter 11), and media and online contexts (Chapter 12). Finally, Part 4, problems in development, contains one chapter covering the range of common socioemotional and behavioral issues during adolescence and fostering resilience (Chapter 13).

Chapter 1

Introduction to Adolescent Development

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Learning Objectives

- **1.1** Define adolescence, its stages, and the characteristics of emerging adulthood.
- **1.2** Discuss the historical origins of adolescence and evidence for popular stereotypes about adolescents.
- **1.3** Describe the developmental processes, tasks, and contexts of adolescence and the role of intersectionality in adolescent development.
- **1.4** Analyze the role of sociohistorical context in adolescent development.
- **1.5** Examine biology-context interactions in development, including gene-environment correlations, gene-environment interactions, and epigenetics.

Imagine a rapid period of change in which you grow taller and heavier and take on new body proportions that feel strange and uncomfortable. Your brain changes radically, influencing how you view the world around you and sometimes making you respond to others in ways that you don't expect and

perhaps may regret. You become better able to think and reason but may find yourself focusing on your self-consciousness, worrying about your appearance, ruminating on what you should have said in response to a friend or teacher, and fearing that others will notice your faults. Suddenly your friends become life rafts keeping you from drowning in the tumultuous surroundings and essential to your very survival. Sound familiar? If you're like most people, you'll probably answer, "In some ways yes and some ways no."

These changes occur during a period of life known as adolescence, the transition from childhood to adulthood. Although all young people experience physical, cognitive, and social changes during this period, not everyone experiences the changes as chaotic. Instead, some young people undergo relatively smooth transitions. In this book we will examine the developmental changes that occur during adolescence as well as variations in young people's experiences.

What Is Adolescence?

1.1 Define adolescence, its stages, and the characteristics of emerging adulthood.

The simplest explanation of **adolescence** is the transition from childhood to adulthood when an individual is neither a child nor an adult. This bare-bones description is an understatement, suggesting that adolescence is a weigh station on the road to adulthood, a time to be endured. On the contrary, adolescence is a vital period of the lifespan, with changes similar in magnitude to infancy. **Development** refers to age-related processes of growth and change and also stability, ways in which we stay the same over time. **Developmental science** is the study of human development at all points in life, from conception to death. In this book, we will examine adolescent development. We, therefore, begin our study of development by considering this question: Why study adolescents?

Why Study Adolescents?

Perhaps the most obvious reason for studying adolescents is to promote their development. Parents and caregivers, teachers, researchers, and policymakers approach this goal with different concerns. Parents and caregivers may seek information about physical development, such as patterns of growth and maturation. They may wonder how adolescents' thinking changes over time, such as when they can make adult decisions. Are teenagers moodier than children and adults? How does emotional control change over time? When can adolescents be treated like adults, and when should they be protected?

Teachers rely on understanding adolescent development to create classroom plans and assignments that match students' abilities. For example, how can educators balance challenging adolescents with supporting their emotional development? School administrators, including principals and school boards, ask questions about creating safe, stimulating environments that support academic achievement. What is their role in promoting adolescents' physical and mental health?

Through scientific studies, researchers work to answer these questions. They examine developmental processes that influence all aspects of adolescents' functioning. Most researchers narrow their study to specific areas of development, such as thinking or emotional development. Some researchers work in laboratory settings. Others study adolescents in their homes, schools, and communities. Some study adolescents' adjustment. How does adversity, such as living in homes and communities in poverty, exposure to violence, and experiencing discrimination, affect development? Researchers often apply their findings to help adolescents by creating interventions and making recommendations to parents, teachers, and policymakers.

Policymakers create and shape **social policy**, that is, local, state, or federal governments' plans and actions to support or improve the residents' welfare. Policymakers turn to researchers for accurate scientific information about adolescent development. For instance, how does screen use affect

adolescents? Is social media harmful? How do community resources, such as green spaces, parks, and access to transportation, influence adolescents' behavior and development? How are race and socioeconomic status related to adolescents' exposure to developmental risks, such as poverty, toxins, and trauma? How is health care access related to adolescents' and families' health and well-being? What influences adolescents' vulnerability to mental health issues, and how can early intervention help them? How can policies address these risks, anticipate other risks, and promote adolescent development?

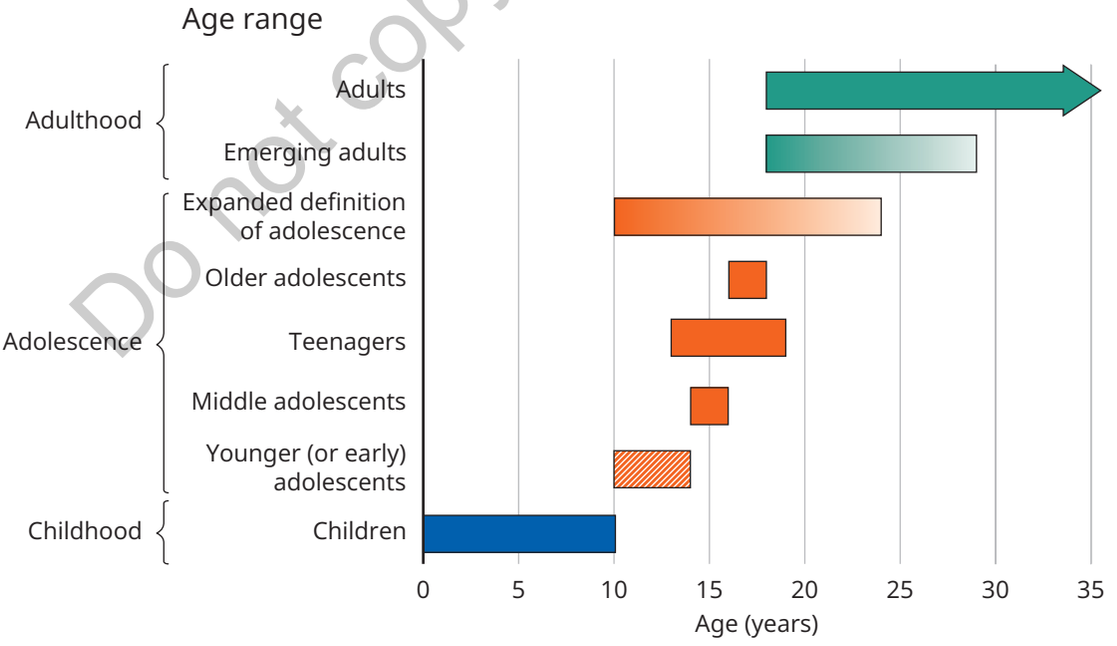
Studying adolescents can also help us understand ourselves. How have our experiences in adolescence, such as physical growth, changes in thinking, and interactions with others, influenced us? How have factors such as race, socioeconomic status, gender, language, and religion influenced our development? Throughout this book, we examine interactions among demographic factors, including race, socioeconomic status, and gender, because they shape our experiences and who we become.

Early, Middle, and Late Adolescence

When does adolescence begin and end? What are its boundaries? The answer to this question is complex. A central tenet of development is that it is lifelong, occurring from conception to death, as shown in Figure 1.1 (Sawyer et al., 2018). Adolescence is a distinct period of the lifespan, but its boundaries have been a source of debate.

G. Stanley Hall (1904), the first scientist to study adolescence, described it as a period ranging from age 14 to age 24. Over 50 years ago, the World Health Organization (1977) proposed that adolescence spanned from 10 to 20 years of age, noting that although it commenced with puberty, the end point was less well defined. The United Nations defines adolescence as the period between 10 and 19 years of age (Kuruvilla et al., 2016). The U.S. Census Bureau (2023a) includes 12 to 19 years in their definition, and the Centers for Disease Control and Prevention (2024) generally marks adolescence as high school age (9th to 12th grade, or about age 14 to age 18). Other researchers have proposed age 10 as the beginning and age 24 (Sawyer et al., 2018) or age 25 (Curtis, 2015) as the end of adolescence. These varying ages illustrate the concept that the boundaries of adolescence are a social construction (Linders, 2017). That is, the beginning and end of adolescence are not set in stone but vary depending on the characteristics ascribed to the period and the settings in which young people live.

Figure 1.1 ▪ Ages in Life



Sawyer et al., 2018.

Although there is a lack of consensus on the beginning and end of adolescence, in this book we define the phases of adolescence as follows:

Early adolescence (ages 10 to 14) corresponds roughly to the U.S. school system's middle or junior high school years.

Middle adolescence (ages 14 to 16) corresponds to the first half of high school in the U.S.

Late adolescence (ages 16 to 18) corresponds to the later high school years.

Emerging adulthood (ages 18 to 25), not a period of adolescence but a period between adolescence and adulthood, often corresponds to postsecondary education.

The phases of adolescence overlap, because this period is characterized by variability. Adolescents vary in the timing of their biological and social transitions and behaviors. For example, one 14-year-old may be an eighth-grader in middle school, and another might be enrolled in high school. Academic and social expectations and opportunities vary dramatically from middle to high school, with high school students typically experiencing more stringent academic expectations as well as more social opportunities to engage in risky behaviors. Historically, the end of adolescence was marked by the adoption of adult roles, such as marriage, which until about 50 years ago occurred typically at about age 20 for females and age 22 for males (U.S. Census Bureau, 2023b). Social changes have shifted the boundaries of both adolescence and adulthood. Today the end of adolescence is more vague and influenced by context, occurring at different times for different people.

Emerging Adulthood

When does an adolescent become an adult? It depends. Today's young people reach traditional milestones of adulthood, such as finishing their education, starting a career, finding a place to live, becoming financially independent, getting married, and starting a family at later ages compared to previous generations. These social changes have extended the transition to adulthood, giving rise to a new life stage known as emerging adulthood (Arnett, 2024).

Characteristics of Emerging Adulthood

Emerging adulthood begins upon leaving secondary school at about age 18 and ends at about age 25 (or as late as 29), when most people start to live independently and adopt adult roles, such as worker, spouse, and parent. In the interim, emerging adults occupy an "in-between" status in which they are no longer adolescents but have not yet assumed the roles that constitute adulthood.

Emerging adulthood is marked by instability and diversity in lifestyles (Arnett, 2024). People ages 18 to 25 have the highest rates of residential change of any age group, shifting among residences and living situations, such as from living with parents to living with roommates to living with romantic partners (Arnett et al., 2014). Changes in romantic relationships are also frequent, and most emerging adults experience several job changes. As we will discuss in Chapter 5, emerging adulthood is a critical time for **identity development**, or coming to a sense of self (Palmeroni et al., 2020). Perhaps most strikingly, emerging adults tend to report a sense of being in between, neither adolescents nor adults. For example, when asked if they felt like an adult, most emerging adults reported "in some respect yes, in some respects no" (Arnett, 2019; Tanner, 2018). As young people make progress toward resolving their identity, they are more likely to perceive themselves as adults (Schwartz et al., 2013). Finally, although emerging adults experience many transitions, instability, and mixed emotions, most have a sense of optimism (Arnett & Mitra, 2020).

Emerging adulthood, ages 18 to 25, is marked by lifestyle diversity, including differences in relationship status, educational enrollment, and residence.

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How emerging adults traverse this period and how long it takes depends on the interaction of the individual's capacities

and the context in which they live—family, social, economic, and community resources (Arnett, 2019; Nelson, 2021; Wood et al., 2018). Transitions do not occur at the same pace or in the same order for everyone. Emerging adults adopt adult roles at different times. Young people vary regarding when they enter careers, marry, and become parents (Eisenberg et al., 2015).

Criticism of Emerging Adulthood

Although observed in young people in many countries, the theory of emerging adulthood is primarily based on samples of youth from Western countries, especially the U.S. For instance, about three-quarters of studies on emerging adulthood published between 2013 and 2015 examined U.S. samples (Ravert et al., 2018). A recent analysis of articles published about emerging adulthood between 1994 and 2023 found that although scientists from 84 countries contributed, 81% of the articles were written by Western scientists, 65% by scientists in North America, and 98% were written in English (Tello-Navarro et al., 2024). Critics argue that emerging adulthood may be a Western phenomenon related to the social and economic conditions prevalent in these societies, especially in North America. Young people's experiences related to contextual circumstances, like SES, may be mistaken for a developmental stage, reinforcing Western-centric views of development (Parameswaran, 2020).

In non-Western cultures, entry to adulthood is often marked by rituals, with clear-cut markers that all youth experience. For example, isolated hunter-gatherer communities tend to have scripted roles, responsibilities, and trajectories. Young people in these communities may not take time to decide what to do with their lives, engage in social experimentation, and find themselves (Schwartz, 2016). Instead, they adopt the roles ascribed to them and aid their communities. Emerging adulthood likely does not exist in these communities.

Critics also question whether the features ascribed to emerging adulthood are exclusive to people in their late teens and twenties. One recent study examined people ages 18 to 60 and found that, although 18- to 25-year-olds endorsed nearly all criteria of emerging adulthood as relevant to them, a high proportion of adults ages 26 to 60 did as well (Arnett & Mitra, 2020). For example, 82% of 18- to -25-year-olds and 80% of 26- to 29-year-olds agreed that "at this time of my life, it still seems like anything is possible." However, the majority of 30- to 39-year-olds and 40- to 60-year-olds (75% and 77%, respectively) also agreed (Arnett & Mitra, 2020). The features that mark emerging adulthood, including identity exploration, self-focus, and optimism, are not experienced exclusively by emerging adults.

Adolescence: A Global View

More adolescents are living in the world today than ever before—a staggering 1.3 billion (World Health Organization, 2023b). Although the majority of these adolescents reside in the Global South, there is a troubling lack of research data on this population (Banati, 2024). The terms *Global North* and *Global South* are used to group countries based on socioeconomic and political characteristics.

The Global North includes economically developed and industrialized nations such as North America, Europe, Israel, Japan, South Korea, Australia, and New Zealand. Adolescents in these countries benefit from better education, health care, and employment opportunities. In contrast, the Global South comprises economically developing and less industrialized countries, often more agricultural, including those in Africa, Latin America, the Caribbean, Asia, and Oceania. Despite their growing economies, developing countries like Mexico, Kenya, and Vietnam generally have lower income levels and living standards. Surprisingly, 90% of the world's adolescents live in low- or middle-income countries (World Health Organization, 2023b).

Adolescent experiences vary greatly, shaped by individual, regional, and cultural factors. However, most research on adolescent development focuses on those in developed, typically Western countries of the Global North. Adolescents in the Global North generally have greater access to education, which in turn enhances their future opportunities for employment and social mobility. However, more than 250 million adolescents in developing countries are not in school, limiting opportunities (World Health Organization, 2023b). Within the Global South, adolescent experiences can differ greatly depending on whether they

live in urban or rural areas. Adolescents in urban areas often have more exposure to Western views and may adopt Western ways of thinking, while those in rural areas tend to uphold more traditional values.

Health outcomes for adolescents also differ markedly between developed and developing countries. Mortality rates for those ages 10 to 24 are highest in sub-Saharan Africa and lowest in Europe and North America (World Health Organization, 2023a). Factors such as limited health care, high rates of violence, and restricted access to food and clean water contribute to higher adolescent mortality rates in developing countries (Lagakos, 2020; Nachiappan et al., 2022). Furthermore, adolescents in developed countries generally have greater access to education, while over 250 million adolescents in developing countries are not in school (World Health Organization, 2023b). In rural areas, educational access is often even more limited, and girls face additional barriers such as gender-based violence, lack of support, and child marriage.

Cultural values also shape adolescent experiences. Countries differ in their emphasis on individualism versus collectivism. Individualism, which is valued in countries like the United States, Australia, and the United Kingdom, emphasizes individual actions and thoughts. In contrast, collectivism, prevalent in countries like China, Brazil, and Mexico, values group actions over individual ones. Interestingly, some cultures show both traits. For example, in Japan, younger adolescents are increasingly adopting more individualistic views while still facing traditional collectivist familial expectations. This can make integrating these values particularly challenging for Japanese adolescents (Sugimura, 2020).

Review

1. What are some reasons scientists study adolescence?
2. Describe three periods of adolescence.
3. What are the defining characteristics of emerging adulthood?
4. What are some differences between nations in the Global North and Global South? Between cultures with individualistic values and those with collectivist values?

Thinking in Context

1. In your view, when does adolescence begin and end? What indicators of its beginning and end are important to you? Why?
2. In your opinion, does everyone experience emerging adulthood? Is it a universal experience? What contextual factors might influence young people's experience of emerging adulthood? Do you think young people from high- and low-socioeconomic-status backgrounds experience emerging adulthood similarly? Why or why not?
3. How might cultural values, such as individualism or collectivism, influence how young people experience adolescence? What kinds of activities and experiences might boys and girls have growing up in a culture that values independence as compared with community? What similarities and differences might you expect?

Apply

Micah, a college student, is confused. He lives away from home, on campus, and is experiencing more freedom than ever. He can stay up all night, go out whenever he wants, and decide whether or not to go to class. Sometimes Micah feels all grown up, but other times he feels like a kid, such as when he has to ask his parents to replenish his meal card and put some cash in his account. Micah still hasn't chosen a career path or even a major.

1. How would you characterize Micah's development?
2. What phase of adolescence do you think Micah is experiencing? Why?
3. How do you think he will change in the coming years? Why?

Adolescence: Its Origins and Today

1.2 Discuss the historical origins of adolescence and evidence for popular stereotypes about adolescents.

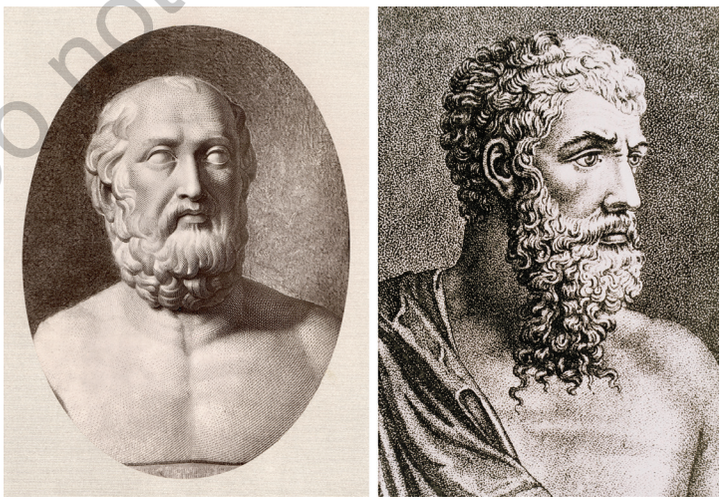
The transition from childhood to adulthood is gradual, occurring over many years. Most people take that idea for granted. However, adolescence, as we know it today, is a new concept that emerged in the late 19th century (Baxter, 2008).

Early History of Adolescence

Even though adolescence was not recognized as a distinct stage of life until recently, in many ancient cultures, young people underwent activities that set them apart from children and adults. In ancient China (sixth century BCE), Confucian principles emphasized education, respect for parents and ancestors, and ethical behavior during adolescence. Adolescents from wealthy families received formal education, while those from nonelite families underwent apprenticeships to learn trades or crafts. Boys from affluent families focused on mastering the Confucian classics, poetry, calligraphy, and history, while girls were taught domestic skills and virtues such as modesty and diligence. Confucian values such as loyalty, righteousness, and humility were instilled in adolescents, and improper behavior was seen as a failure of the family to impart proper values.

In ancient Greece (fourth century BCE), Plato proposed several stages in the lifespan, including a period between childhood and adulthood. He argued that childhood education should emphasize sports and music because children's minds are still undeveloped, and that as adolescents become capable of reasoning, they should study science and mathematics.

Aristotle, a student of Plato, described three 7-year periods of maturation that correspond to current views of development. The period Aristotle referred to as *infancy* spanned from birth to age 7. Aristotle proposed that reasoning may first emerge in *boyhood* (ages 7 to 14) and develop through *young manhood* (ages 14 to 21). As in current views of adolescence, Aristotle viewed independent decision-making and the ability to carry out choices as a marker of maturity (Lerner & Steinberg, 2009). The labels Aristotle chose for his developmental periods are considered sexist in today's world, but at that time, virtually all theory and research were based on male models. As we will discuss, gender, race, and other characteristics influence people's experiences and development (Ghavami et al., 2016). For example, theories created solely from examinations of boys and men often cannot adequately account for girls' and women's development.



Greek philosopher Plato (left), a disciple of Socrates, and classic philosopher and developmental theorist Aristotle.

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Although philosophers Plato and Aristotle theorized about the unique nature of childhood and adolescence, for centuries children were viewed and treated as miniature adults and expected to work alongside adults (Aries & van den Berg, 1978). It wasn't until 1,500 years later that the term *adolescence* was first used. A derivative of the Latin word *adolescere*, meaning to grow into maturity, was used in the 15th century (Lerner & Steinberg, 2009). In the 18th century, Jean-Jaques Rousseau defined three stages of maturation (Kett, 2003; Lerner & Steinberg, 2009). The first, from birth to age 12, is when children are guided by their impulses. Reasoning develops in the second stage (12 to 16), and individuals mature cognitively and emotionally in the third stage (16 to about age 20). Rousseau explained that reasoning begins to override and inhibit impulses during adolescence, and young people mature. However, it wasn't until the late 19th century that the term *adolescence* became commonly used (Kett, 2003). The shift in contextual conditions led to the definition of adolescence as it is stands today—a distinct period in life.

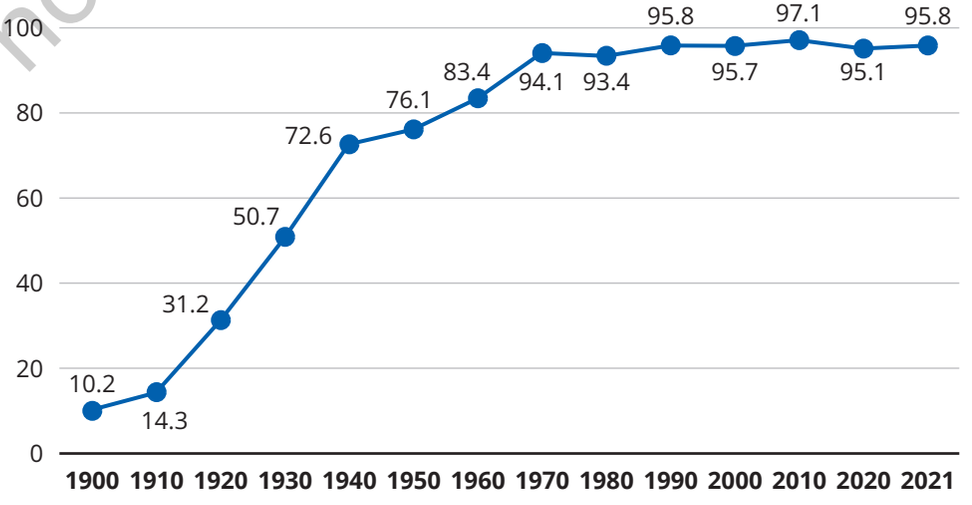
Adolescence as an Invention

Between 1890 and 1920, several social changes came together to create the concept of adolescence as we understand it today. The Industrial Revolution transformed work and family life because many people moved from working on farms to urban factories. As the demand for labor rose, children and adolescents began working in factories and mines. Often preferred because they were less expensive than adults, children and adolescents routinely worked long hours, and few U.S. states regulated children's work.

As the Industrial Revolution progressed and more jobs became mechanized, the need for unskilled labor fell. Adults replaced children and adolescents in these positions, and the demand for skilled labor, which required education, increased. Simultaneously, a growing body of youth workers, educators, and professionals argued that children do not belong in the adult workplace and must be protected from the hazards of the adult workplace. Soon, many U.S. states created laws prohibiting child employment and limiting the hours young adolescents can work (Kett, 2003).

Before 1890, only a few U.S. states mandated that children attend school. However, between 1890 and 1920, all states passed laws requiring students to attend primary and secondary school, resulting in a significant rise in school attendance among adolescents. In 1890, only about 6% of adolescents ages 14 to 17 attended school; by 1920, it was 31%, and by 1930, 51% (see Figure 1.2) (National Center for Education Statistics, 2023). Today, about 96% of adolescents ages 14 to 17 attend school. As adolescents were separated from adults and grouped with other adolescents, it became increasingly clear that they differed from adults, and current conceptions of adolescence emerged.

Figure 1.2 ▪ High School Enrollment Trends 1900–2021



Source: National Center of Education Statistics, 2023.

Adolescence as a Period of Storm and Stress

Often referred to as the father of adolescence, G. Stanley Hall (1844–1924) is credited with beginning the scientific study of adolescence. In 1904, he published a two-volume work titled *Adolescence: Its Psychology and Its Relations to Physiology, Anthropology, Sociology, Sex, Crime, Religion, and Education*. In it, he defined adolescence as a period of "storm and stress," a time of inevitable and extreme upheaval, triggered by **puberty**, the biological transition to reproductive maturity, and therefore universal. According to Hall, adolescents were *expected* to display negative behaviors, such as "cruelty, laziness, lying and thievery" (pp. 334–335). He argued that "All boys develop a greatly increased propensity to fight at puberty, and . . . seem very terrible in their rage . . ." (p. 356).

Most adolescents sometimes feel sad, but adolescence is not the period of turmoil G. Stanley Hall envisioned.

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Hall based his theory on then-popular recapitulation theory, which in turn was based on Lamarckian evolutionary theory. He suggested that memories and acquired characteristics can be inherited from generation to generation and that the development of the individual recapitulates or reenacts the development of the human species as a whole (Buchanan & Bruton, 2016). Hall explained that adolescents' extreme volatility is inherited and reflects a time in human history characterized by upheaval and disorder that corresponded to the birth of civilization. Therefore, intense turmoil, such as serious depression, severe troubles with parents, and extreme delinquent activity, was to be expected and was a sign of normal healthy development triggered by puberty. Lamarckian evolution and recapitulation theory have been discredited in favor of Darwinian evolution, and many scholars reject Hall's extreme views on adolescence (Youniss, 2006). Yet Hall's premise that adolescence is a period of storm and stress rooted in biology remains a popular view (Arnett, 2006).

Research suggests that, contrary to Hall's view, turmoil is neither universal nor healthy (Buchanan & Bruton, 2016). For example, emotional volatility or moodiness may become more common during adolescence, particularly early adolescence. However, as we discuss throughout this book, most young people function well and maintain close relationships with their parents. In a classic study, adolescents from 10 countries (Australia, Bangladesh, Germany, Hungary, Israel, Italy, Japan, Taiwan, Turkey, and the United States) reported that they were usually happy, felt that they got along with their parents, and felt good about their progress toward adulthood (Offer et al., 1988).

Most adolescents engage in some risky behaviors, such as extreme sports and experimentation with alcohol, and some problems, such as substance abuse, may emerge during adolescence. However, for the majority of adolescents, risk behaviors are mild and temporary, and most adolescents do not experience serious problems (Boyer & Byrnes, 2016; Lerner et al., 2015). In addition, risk behavior has declined over the past five decades (Twenge & Park, 2019). Researchers who study adolescence tend to adopt a modified storm-and-stress view in which problems *may* be likely to emerge for *some* young people during adolescence but are not inevitable (Buchanan, Romer, et al., 2023).

Although puberty and biological changes undoubtedly influence adolescents' experiences, contextual influences also play a role. Hall's view of adolescence as a universal, biologically based period of extreme storm and stress not being supported by research; however, his view of adolescence has influenced popular culture (Hollenstein & Lougheed, 2013).

Adolescence as Culturally Constructed

According to anthropologist Margaret Mead (1901–1978), adolescent turmoil is not biologically inevitable but varies with culture (Mead, 1928). Mead studied adolescents on the remote island of Samoa, located in the Pacific Ocean about halfway between Hawaii and New Zealand. She observed girls in childhood and during and after puberty and noted no significant shifts in emotional displays and behavior. Mead concluded that Samoan youth do not experience adolescence as a period of storm and stress.

Cultural differences in social environments and demands shape adolescents' experiences (Mead, 1941). Samoan adolescents generally have limited life choices and a clear path to adult roles, resulting in a smooth transition to adulthood. On the other hand, North American adolescents tend to have a wide array of choices, which can be stressful. Mead concluded that adolescence is culturally construed. The experience of adolescence and its associated stress varies across cultures depending on the demands placed on adolescents and the range of roles they are expected to assume as adults. Although Mead's research methods have received criticism (Freeman, 1983), her argument about the role of culture in shaping adolescent development and experience remains influential (Bertram, 2020; Côté, 2000)

Challenging Stereotypes About Adolescence

Although developmental scientists have debunked Hall's storm-and-stress view of adolescence, it remains a popular stereotype. Many adults, for instance, agree with statements such as "Adolescence is a difficult time of life" and assume that adolescents "will be more difficult to get along with" (Hines & Paulson, 2006). In one study, parents surveyed over three years, as their children moved from fifth to eighth grade, reported that their children became less agreeable and less conscientious—that is, less "nice"—over the transition to adolescence (Göllner et al., 2017).

Like parents, young people often subscribe to the view that adolescence is inherently challenging, a period of storm and stress. French adolescents in one study, for example, tended to agree that adolescence is a period of heightened risk-taking compared to adulthood and that peer presence promotes this effect (Habib et al., 2023). Such beliefs can create self-fulfilling prophecies whereby adolescents' expectations influence their behavior (Buchanan & Bruton, 2016). If they believe adolescence is a time of irresponsibility, school disengagement, or heightened risk-taking, adolescents may engage in more of those behaviors because they consider them "normal" (Qu, 2023; Telzer et al., 2022).

Indeed, adolescents who hold more negative stereotypes of adolescence are more likely to engage in risk-taking, have more conflict with parents, and have poorer school performance (Buchanan & Hughes, 2009; Qu et al., 2020). For example, a study of boys followed from seventh to ninth grade found that those who expected adolescence to be a period of declining relationships with parents engaged in more risk-taking over the transition from middle to high school (Qu et al., 2018). Conversely, the reverse is also true. Chinese adolescents' expectations for responsibility during adolescence were associated with better school achievement and self-control (Qu et al., 2022).

Parents' expectations also matter. Parents convey their beliefs about adolescence through their interactions, expectations, and the rules they set and how they enforce them. Negative beliefs about adolescence influence how parents anticipate, perceive, and react to their teen's behavior, creating self-fulling prophecies and the poor behavior they expect (Qu, 2023; Zimmerman et al., 2022). Similarly, stereotyped messages from peers and teachers, expecting risk-taking, are associated with adolescent problems.

Many adolescents are members of intergenerational households and help siblings, parents, and grandparents.

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Conceptions of adolescence and expectations for adolescent behavior are influenced by culture. Cultural values in North America and other Western countries tend to emphasize individuality and view development as a process of becoming independent, whereas Asian and non-Western cultures, especially traditional cultures, tend to value collectivism, in which individuals develop close supportive ties with their family and community (Markus & Kitayama, 2010). For example, U.S. seventh-graders agreed that adolescence was a time of dampened family obligations and increased disengagement from school, whereas Chinese youth viewed adolescence as a time of fulfilling family responsibilities and spending effort on academic learning; these beliefs predicted the adolescents' behavior, both positive and negative (Qu et al., 2016).

Although values are often described as typical for a given culture, there is also variation within cultures (Markus & Hamedani, 2020). A recent study showed that urban adolescents in Hong Kong tended to adopt more Western views of adolescence, focusing on independence, while adolescents in Chongqing, a less developed city in China, emphasized Confucian values such as responsibilities to parents (Qu et al., 2020). These differing views of adolescence predicted adolescent behavior one year later. Seeing adolescence as a challenging period was linked to an increase in problem behavior. Youth problem behavior also contributed to negative stereotypes over time, suggesting that the behavior fostered by teen stereotypes may contribute to maintaining them.

Despite differences in cultural values, adolescents around the world show many similarities in behavior. A recent longitudinal study of adolescents from 11 cultural groups in eight countries revealed that overall adolescent behavior was more positive than negative in all cultures (Buchanan, Zietz, et al., 2023). Although behavior problems increased, reaching the highest point at age 14, the overall prevalence of problem behavior was low at all ages, suggesting that problems are not typical for adolescents.

Why does the storm-and-stress view remain prevalent despite research to the contrary? The storm-and -stress label is descriptive, catchy, and vivid. Although research has described what doesn't characterize adolescence (storm and stress), it has not clearly defined what adolescence *is* (Buchanan, Romer, et al., 2023). Researchers propose reshaping popular views of adolescence to instead describe it as a period of promise and possibility or openness and opportunity (Buchanan, Romer, et al., 2023).

Review

1. What are the origins of the term *adolescence*? Were adolescents always treated differently from children and adults?
2. Why do some say that adolescence is an invention?
3. How did Hall describe adolescence?
4. What evidence is there for adolescent storm and stress?
5. What are some of the ways that adolescents are stereotyped, and what are the effects of stereotypes?

Thinking in Context

1. In your opinion, can periods of life such as adolescence and emerging adulthood be "invented"? Why do some researchers argue that they are inventions? What do you think?
2. To what extent was your adolescence stormy and stressful? Explain. How well does your experience match Hall's perspective?
3. What are some of your culture's values and expectations about adolescents? What are some of the stereotypes about adolescents that you have observed?
4. Why do you think stereotypes about adolescents continue to persist? How have values, expectations, and stereotypes influenced your experience as an adolescent?

Apply

As a child, Megan was easygoing, well liked, and kind to everyone. Now, at age 14, it's a different story. Megan says she hates her parents, gets into fistfights at school, and has started smoking marijuana with her 18-year-old boyfriend. Megan's parents are desperate to know: Is this normal? Do all adolescents go through this? How do you respond?

Adolescent Development: Processes, Tasks, and Contexts of Development

1.3 Describe the developmental processes, tasks, and contexts of adolescence and the role of intersectionality in adolescent development.

We have defined adolescence and examined its history and common stereotypes about adolescents. What develops during this period? Where do adolescents spend their time? What developmental tasks do they face? Next, we take a closer look at adolescent development.

Developmental Processes of Adolescence

Think about all the ways in which you've changed from childhood until now. You've likely grown taller, more mature, and better at expressing your ideas and needs. You can probably identify many more changes. Developmental changes are *multidimensional* and include shifts in physical, cognitive, and socioemotional function (Baltes et al., 2006). **Physical development** refers to body maturation and growth. In adolescence, physical development is driven by puberty, the attainment of reproductive maturity, and changes in body size and shape, including the growth of breasts in girls and facial hair in boys.

Cognitive development refers to the maturation of thought processes and the tools we use to obtain knowledge, become aware of the world, and solve problems. Adolescents become faster and more efficient in their thinking than children. Most notably, adolescents develop the ability to think abstractly. They become able to solve hypothetical problems, often in similar ways as adults.

Socioemotional development includes changes in emotions, views of oneself, interactions with others, understanding of relationships, and social competence. Adolescents become driven to understand themselves and find their place in the world. They become better at understanding and controlling their emotions, taking other people's perspectives, and improving relationships.

As you might guess, these different areas of development are not isolated, independent changes, but rather they co-occur and influence each other. Physical growth occurs alongside cognitive maturation, and socioemotional changes accompany both. Changes in one area spill over and trigger changes in others, a concept called **developmental cascades** (Bornstein et al., 2013; Masten & Cicchetti, 2010; Oakes, 2023). For example, brain maturation, a form of physical development, influences many aspects of development, including advances in abstract reasoning (cognitive development) and emotional regulation (socioemotional development). These physical and cognitive changes enable adolescents to understand their friends' points of view better, become more empathetic and sensitive to their friends' needs, and develop more mature friendships (socioemotional changes) (Andrews et al., 2021; Pfeifer & Allen, 2021). In turn, these mature friendships can lead to more complex conversations, potentially improving adolescents' thinking skills. Developmental cascades, the ways in which developmental changes spill over to influence each other immediately and over time, are a central feature of adolescent development that we will consider throughout this book.

Developmental Tasks of Adolescence

Adolescents' physical, cognitive, and socioemotional development influences their progression on several interacting developmental tasks or challenges unique to the adolescent period that influence adjustment (Pinquart & Pfeiffer, 2020). We are faced with developmental tasks throughout our lives, each specific to particular ages and associated with particular achievements or developmental milestones (Havighurst, 1972). Our progression on each task is influenced by physical, cognitive, and socioemotional development and the social resources and supports available to us.

Identity

Often depicted in movies and other media, the task of **identity** refers to forming a sense of self. Advances in cognition permit adolescents to think about themselves, their families, and their peers

in more sophisticated ways. Adolescents begin to recognize their uniqueness and, for the first time in life, wonder, "Who am I?" Identity development entails developing a sense of individuality in multiple realms, such as gender, physical attributes, sexuality, and career, while retaining a sense of connection to others. Social interactions with parents and peers help adolescents determine their sense of identity.

Autonomy

Generally speaking, **autonomy** refers to self-governance or independence. The developmental task for adolescents is to become capable of governing their emotions, values, and behavior. As adolescents develop *emotional autonomy*, they become more self-reliant and less emotionally dependent on their parents while retaining emotional closeness to their parents. *Value autonomy* develops as adolescents adjust to their emerging cognitive skills and apply them to reason about the social world. Adolescents develop a multifaceted understanding of moral behavior and an internalized sense of right and wrong—a personal value system. A third component of autonomy, *behavioral autonomy*, refers to the ability to control impulses, resist pressure from others, and make and carry out decisions. Autonomy is related to identity, as adolescents with a more developed sense of self may be more prepared to demonstrate autonomy. In turn, the capacity for self-governance may facilitate identity development.

Intimacy

Adolescents' ability to understand other people's perspectives influences their interactions and relationships. Cognitive and socioemotional development are critical contributors to developing a sense of **intimacy**, the ability to form and sustain close relationships. During adolescence, the task is to develop the ability for close, genuine relationships characterized by honesty, trust, and mutual respect. Intimacy is connected to emotional autonomy, as adolescents who are emotionally independent of their parents yet maintain a connection to them are better prepared to establish intimate relationships with peers and romantic partners. Similarly, a sense of identity may contribute to intimacy, as adolescents who understand themselves can better focus on others' needs and form intimate connections.

Sexuality

With puberty, adolescents' bodies transform, often quickly. They must become comfortable with their bodies and the reactions of others. Developing a positive body image and comfort with one's body influences **sexuality**, the understanding and expression of sexual feelings and behaviors. Adolescents must become aware of and manage sexual feelings and engage in healthy sexual behaviors. Sexuality is linked with identity, as adolescents' grasp of their sexual identity may help them interpret their sexual feelings and behavior. Intimacy is also relevant to sexuality, as it is through close relationships that adolescents may experiment and come to understand their sexuality. Autonomy also influences sexuality, as self-reliance, personal values, and behavioral control contribute to adolescents' sexual behavior.

Contexts of Adolescence

All adolescents experience biological, cognitive, and socioemotional changes. However, the meaning ascribed to these changes and their effects on adolescents' behavior and relationships varies. The physical changes of puberty are accompanied by excitement in some adolescents and heightened self-consciousness in others. Advances in abstract thinking and hypothetical reasoning enable some adolescents to excel in school. Others may engage in intense introspection that can influence depression. With advances in socioemotional development, adolescents are driven to understand themselves. Some adolescents learn about themselves by exploring new activities and hobbies, others read philosophy and consider different values, and others engage in risk-taking, such as antisocial behavior and substance use. Why are these universal physical, cognitive, and socioemotional changes experienced so differently?

Development is shaped by the environments in which we live. All adolescents undergo the same physical, cognitive, and socioemotional transitions, but their experiences and effects are influenced by their unique physical and social worlds. More specifically, adolescent development is influenced by its **context**, where and when a person develops. Context encompasses many aspects of the physical and social environment, such as family, neighborhood, country, and historical period. It includes intangible factors and characteristics that are not visible to the naked eye, such as values, customs, ideals, and

culture. For example, were you encouraged to be assertive and actively question the adults around you, or were you expected to be quiet and avoid confrontation? What values shaped your parents' child-rearing practices and your values? How did your family's economic status affect your development?

We are embedded in many contexts that influence us and that we influence, such as our peer group, school, neighborhood or community, and culture (Osher et al., 2021). Moreover, contexts interact. Adolescents' experiences at home influence their interactions at school, and what happens at school can influence their interactions at home. To understand an individual's development, we must look at their context.

Home Context

The home context is perhaps the most obvious influence on development. It includes family; interactions with parents, siblings, and other household members; and family demographics, such as ethnicity, race, socioeconomic status, and family composition (single-parent, divorced, two-parent, same-sex parents). Families have distinct patterns of communication, conflict resolution, expectations, parental involvement, and family roles. Through our relationships with parents, siblings, and other household members, we learn to communicate, share, understand emotions, and understand ourselves. The home context includes more than relationships. Household resources and circumstances influence opportunities for play, learning, health, and education.

School Context

The school context includes interactions with teachers, coaches, administrators, and classmates. It includes classroom interactions with teachers and students, teachers' expectations and provision of academic and emotional support, and physical features such as light, space, and resources such as books and computers. The school's location, size, resources, and quality influence adolescents' development. Schools vary in academic expectations, course offerings, access to educational resources, extracurricular activities, and special education services.

The school context includes classmates, teachers, classrooms, and school resources.

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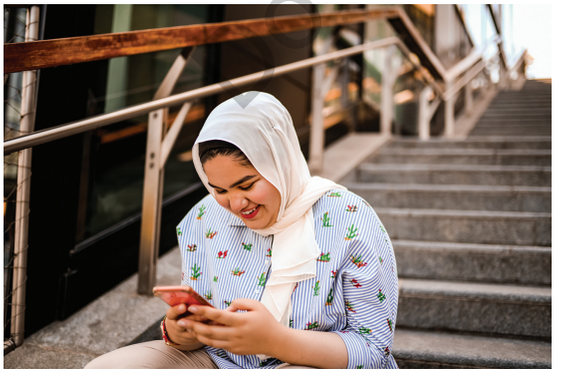

Adolescents interact with others online, through social media and gaming, making the online context an important influence on development.

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Peer Context

The peer context includes friendships, social relationships, and romantic relationships. Peers tend to form different social groups within schools and neighborhoods. Peer groups differ in interests, activities, and orientation toward academics, risk-taking, and peer culture. Some groups are more exclusive and limited to a select few adolescents, and others are larger and more inclusive.

Neighborhood Context

The neighborhood context includes location, demographics, socioeconomic status, resources, opportunities, and challenges. Neighborhoods vary in resources, such as access to libraries, after-school programs, health care facilities, and even grocery stores. Some communities are walkable, with sidewalks, green spaces, and public transportation. Others offer fewer opportunities for outside activities. Neighborhoods vary in rates of crime and violence, and their residents vary in feelings of safety. The safety and resources of a neighborhood influence adolescents' experiences, including their activities, level of supervision, and opportunities for independence.

Online Context

Historically speaking, the online context is new, having emerged over the past two decades. It includes interactions with people, activities, games played alone or with others, and access to resources and information. Social media has become a critical context for adolescent development, where they interact with existing friends, meet new friends, and learn about trends. Adolescents experiment with self-presentation, varying their online images and interactions to learn about themselves. We examine adolescents' online activities in Chapter 12.

Cultural Context

The cultural context refers to the culture we are immersed in, including relevant values, ideals, and beliefs. **Culture**, the set of customs, knowledge, attitudes, and values shared by group members, is learned early in life through interactions with group members, such as family (Markus & Kitayama, 1991). The culture in which we are immersed influences all of our contexts and includes the processes we use to understand and interact with group members (Jones & Mistry, 2019).

Developmental scientists have only recently recognized the importance of culture. Most classic theories and research on development are based on Western samples because researchers once believed that the processes of human development were universal. However, these studies often yielded narrow views of human development that did not consider the variety of cultural settings in which people live. In some cases, developmental differences in children and adolescents of other cultural groups were considered abnormal rather than the result of different contextual circumstances (Packer & Cole, 2020).

We now know that development varies dramatically with cultural context—and that these differences are not deficiencies or abnormalities (McCoy, 2022). The cultural context in which individuals live influences the timing and expression of many aspects of development, even physical development, such as the age at which infants begin crawling and when adolescents begin puberty, long thought to be a matter of biological maturation (Amir & McAuliffe, 2020; Leone & Brown, 2020). These differences are influenced by access to nutrition and health resources and parenting practices. Therefore, applying development principles derived from Western samples to individuals of other cultures can yield misleading conclusions about their abilities (Keller, 2017; Miller et al., 2020).

There is increasing recognition that each culture contains multiple subcultures (Oyserman, 2017). North American culture is not homogeneous; many subcultures exist, defined by factors such as ethnicity (e.g., African American, Asian American), religion (e.g., Christian, Muslim), geography (e.g., Southern, Midwestern), and others, as well as combinations of these factors. Current trends in cultural research document diversity and emphasize understanding how the historical, cultural, and subcultural contexts in which we live influence development throughout our lives. In sum, culture is inherent in all domains of development and contributes to the context in which we are embedded, transmitting values, attitudes, and ideas that shape our thoughts, beliefs, and behaviors.

Sociohistorical Context

The sociohistorical context refers to the unique influence of societal and historical forces that shape development, such as politics, wars, epidemics, natural disasters, and economic booms and recessions. Our development depends not just on where we live but on *when* we live and our sociohistorical context. We discuss sociohistorical context later in this chapter.

In sum, adolescents are immersed in and interact with a web of contexts that interact dynamically. Home, peer, and school contexts often overlap as family relationships influence and are influenced by peer relationships as well as interactions at school. These home, school, and peer contexts are embedded in a larger neighborhood context, influenced by a larger cultural context embedded in a sociohistorical context. Finally, not only are adolescents influenced by their contexts, but they influence their contexts. They interact with family members, peers, teachers, and community members, thereby influencing the contexts in which they live and, in turn, their development.

Intersectionality and Adolescent Development

Adolescents' interactions in their contexts—home, school, neighborhood, and so on—and the meaning they derive from these experiences vary with their membership in social categories, including gender, race and ethnicity, sexual orientation, religion, and socioeconomic status. Increasingly, developmental scientists recognize that the effects of demographic variables are not universally applicable (Ghavami et al., 2016; Godfrey & Burson, 2018). Instead, individuals' unique experiences and perspectives are shaped by **intersectionality**—the complex interplay of identities related to gender, race and ethnicity, sexual orientation, and social factors such as socioeconomic status and disabilities (Crenshaw, 1989).

We are all members of multiple interconnected social categories, and our experience of each category is shaped by our membership in other categories. Adolescents' understanding of gender may be

filtered through the lens of their membership in another social category, such as ethnicity. Their experiences as part of an ethnic group are intertwined with their gender. For example, Latina girls' views of themselves and their worlds may be quite different from those of Latino boys as well as girls of other ethnicities, such as Black or Mexican American girls. In this instance ethnicity and gender intersect to affect how girls view themselves. Most individuals belong to several social categories, aside from ethnicity and gender, which interact to shape their perceptions. The importance of social categories and their meaning varies with the context, with some being more salient and meaningful in specific contexts and times than others.

Intersectionality emphasizes a contextual approach to understanding how perceptions, stereotypes, and discrimination about gender, ethnicity, race, sexual orientation, and socioeconomic status, for example, overlap and interlock, creating distinct experiences for subgroup members, with implications for their development (Crenshaw, 1989; Syed & Ajayi, 2018). For instance, intersecting expectations about race and gender may uniquely shape the experience of Black boys in classroom settings, affecting how they are perceived and treated in ways that differ from how boys of other races and ethnicities are treated and the experiences of Black girls—with implications for their academic performance, development, and long-term outcomes (Roy, 2018). A recent study of Black high school students found that discrimination at school was associated with greater depressive symptoms, lower academic persistence, and lower school satisfaction one year later (Cooper et al., 2022). Unexpectedly, adolescents who perceived greater disciplinary inequities showed greater academic persistence. In addition, gender differences emerged; perceptions of school disciplinary inequities were associated with lower educational aspirations for girls and higher aspirations for boys.

In the past, research studies have often excluded people of color, or they have grouped participants of different ethnicities and races together, masking differences and contributing to a sense of invisibility among people of color (Syed et al., 2018). For example, an analysis of articles published in leading developmental science journals between 2006 and 2010 found that only 14% of the studies included samples that were predominantly people of color, and a surprisingly high 28% did not mention the racial/ethnic composition at all (Nielsen et al., 2017).

Intersectional research, rooted in Black feminism, has focused on examining privilege and oppression in individuals identifying as Black and White. It has shed light on how structural inequalities limit opportunities for Black youth in areas such as education, employment, and community participation. There is an increasing call from Latino, Indigenous, and Asian-origin scholars and activists to pay attention to other cultural and ethnic-racial communities that have a long history of oppression and discrimination in the United States and other countries (Azmitia et al., 2023; White et al., 2023; Yip et al., 2023). Multiracial youth who must integrate multiple ethnic identities are particularly understudied despite their growing numbers, expected to exceed 11% of the U.S. population by 2060 (Nishina & Witkow, 2020) Moreover, the scope of intersectionality has expanded to include religious identities, sexual identities, and body image in addition to gender and race (Ahmed & Abdallah, 2023; Coulter et al., 2021; Morrison et al., 2020).

The study of intersectionality sheds light on how discrimination, marginalization, oppression, and privilege combine to shape the experiences of adolescents in distinct ways (Crenshaw, 1989). It is an emerging approach in developmental science with a growing body of research that recognizes how factors like gender, ethnicity and race, sexual orientation, religion, socioeconomic status, and disability interact to influence development (Godfrey & Burson, 2018). Throughout this book, we will examine adolescent development through an intersectional lens whenever possible.

Review

1. Define three domains of development and the concept of developmental cascades.
2. Identify four developmental tasks for adolescents.
3. What are some of the contexts in which adolescents are embedded?
4. What is intersectionality?

Thinking in Context

1. Give examples of how physical, cognitive, and socioemotional development may interact. How might a physical change influence adolescents' thinking or socioemotional functioning? How might cognitive or socioemotional changes influence other aspects of development?
2. What contexts do you believe are most relevant to adolescents? Why? What context was most influential for you in adolescence? Why?
3. Consider the social categories of which you are a member (perhaps gender, race or ethnicity, socioeconomic status, or religion). Which are most important to you? How might these social categories interact to influence your experiences? What are some of the challenges of studying development through an intersectional lens?

Apply

After his parents' divorce, 17-year-old David and his mother moved to a new neighborhood. David used to play basketball with his friends each afternoon, but he has made few friends in his new neighborhood. His mother believes the disadvantaged neighborhood is dangerous and instructs David to come home right after school each day. His new school has limited resources, including poor access to modern computers, outdated library books, few advanced courses, and almost no extracurricular activities. David excels in abstract reasoning and problem-solving but often feels disengaged in his classes because they don't challenge him. His teachers provide little support or feedback. David is considering dropping out of school to pursue work.

1. Discuss the interactions among David's physical, cognitive, and socioemotional development and well-being.
2. How might the school and neighborhood contexts influence David's engagement, motivation, and development?
3. How might other contexts, such as home, peer, and online contexts, influence David's experience in and out of school?
4. How might the developmental tasks of adolescence influence David's experience?

Sociohistorical Context and Adolescent Development

1.4 Analyze the role of sociohistorical context in adolescent development.

The time in which we live and its unique historical events and trends, including wars, epidemics, advances in science and technology, and economic shifts such as periods of recession or prosperity, influence our development (Baltes, 1987; Elder & George, 2016; Elder et al., 2015). Contextual influences tied to specific historical eras explain why a generation of people born at the same time, called a **cohort**, is similar in ways that people born at other times are different.

Adults who grew up during the Great Depression and World War II are similar in some ways that make them different from later cohorts. For example, they tend to have particularly strong views on the importance of the family, civic-mindedness, and social connection (Bühler & Nikitin, 2020; Rogler, 2002). The same is true for other cohorts, such as adolescents of the 1960s who grew up during the Vietnam War, adolescents of the 1990s who experienced rapid technological changes, and adolescents today who experienced the rise of social media and the COVID-19 pandemic.

Sociohistorical Context and Life Stage

While we are all influenced by our sociohistorical context, the degree of influence may vary with our life stage, whether children, adolescents, or adults. The same historical event may be experienced differently by even successive cohorts close in age because they are in different life stages, with different social roles, levels of maturity, and life experiences. A vivid example comes from researchers who examined the influence of the Great Depression (1929–1941) and World War II (1939–1945) on two cohorts of California-born Americans born just eight years apart in Oakland and Berkeley and followed from childhood to older adulthood over a 70-year period (Elder & George, 2016).

Boys in the older Oakland cohort (born in 1920–1921) were children during the affluent 1920s, a time of economic growth in California, and they experienced a prosperous and relatively stress-free childhood. They entered adolescence during the Great Depression, a period of severe economic stress in which unemployment skyrocketed and people's savings were depleted. As adolescents during the Great Depression, the Oakland boys tended to behave responsibly and assist their families in coping, such as by working jobs outside the home, which enhanced their independence and sense of responsibility and reduced their exposure to family stress. The Oakland cohort completed high school just before the onset of World War II, and over time, nearly all the young men entered the armed forces.

Unlike the Oakland cohort, boys in the Berkeley Guidance Study (born in 1928–1929) experienced the Great Depression in early childhood, at a time when they were vulnerable and very dependent on family. The Berkeley cohort entered adolescence during World War II, a period of additional economic and emotional stress resulting from empty households (as both parents worked to support the war effort) and the military service and war trauma of older brothers. As adolescents, the Berkeley boys' outlook was bleaker than those in the Oakland cohort. Berkeley boys experienced emotional difficulties, poor attitudes toward school, and less hope, self-direction, and confidence about their future. The Berkeley boys' outlook improved in adulthood, largely because of their experiences in military service. Three-quarters of the Berkeley sample served in the military between 1945 and the end of the Korean War in the early 1950s. The most disadvantaged young men tended to enlist in the military at a young age. They benefited from the structure, travel opportunities, and, later, the GI Bill of Rights, which enabled them to further their education and acquire new skills after the war.

These two groups of young people, born just eight years apart, had strikingly different childhood and adolescence experiences, illustrating the role of sociohistorical context in development. Although boys in both cohorts tended to develop into mature, productive adults, they took different paths. Context always plays a role in development—not only in times of social upheaval but every day and for every generation.

The Power of Adolescent Experiences in Marking Generations

Generations are marked by the specific sociohistorical factors that individuals encounter as they come of age, particularly during adolescence. Sociohistorical influences include historical events and the overall circumstances of a time, including politics, education norms and opportunities, technology, popular fads, and movements, such as climate change and social justice activism. The historical time in which children and adolescents grow up makes them similar to one another and different from those who grew up in other times. These differences tend to persist into adulthood, creating distinct generational identities.

Why are experiences during adolescence critical in shaping each generation's identity? Adolescence is a period of powerful firsts: becoming aware of the world outside our homes and schools, spending unsupervised time with peers, developing intimate friendships and relationships, and understanding ourselves. As adolescents develop cognitively, they begin to think abstractly, which can prompt them to become interested in and start to understand complex social issues. They tend to become more aware of current events, including wars, pandemics, and environmental and human rights issues. With their emotional control still developing, adolescents may have powerful emotional responses to events that they may have difficulty processing and controlling. Their emerging values and beliefs about right and wrong can sensitize adolescents to injustice. Adolescents' developing sense of autonomy can prompt them to act on their values and become civically engaged.

Experiences during adolescence can shape our views and our sense of self. Peers play a significant role in shaping generational identity. Adolescents share cultural trends, music, media, and fashion. Generational comparisons, such as adults comparing the trends of their day with current trends, can strengthen bonds among peers and foster a sense of "us" versus "them." Adolescents' shared experiences of trends and historical events create strong bonds and a shared identity that defines their generation.

Generations

Every generation or birth cohort experiences unique cultural and societal forces during their youth, shaping their perspective. While we identify generations by years (Table 1.1), the boundaries are flexible, and there is overlap. For example, individuals born at the end of a generation may share similarities with their generation and the following generation. Similarly, those born at the start of a generation may have different experiences and perspectives than those born toward the end. Finally, it is important to note that generational characteristics are generalizations and do not apply to every person (Dimock, 2023). There are individual differences, and not everyone shows the characteristics of their generation. Next, we examine the generations living today.

Silent Generation (Born 1928–1945; Adolescents in the 1940s–early 1960s)

The Silent Generation, born between 1928 and 1945, were adolescents during the 1940s through the early 1960s. As children during the Great Depression (1929–1939) and World War II (1939–1945), they valued traditional family roles and family unity. This was influenced by the need to rebuild families and communities after the war when they were adolescents, during a time of economic growth following the end of World War II that led to the growth of suburban America and increased consumerism (Twenge, 2023). The onset of the Cold War in 1947, a period of geopolitical tension between the United States and the Soviet Union, fostered a sense of national unity and patriotism. Members of the Silent Generation tended to have a strong work ethic and loyalty to employers, which helped build the foundation of corporate America. The youngest members of this generation, adolescents in the early 1960s, played a role in the emerging civil rights and feminism movements.

Culturally, this generation listened to big band music in the 1940s and witnessed the birth of rock and roll in the late 1940s and early 1950s. Television became popular, replacing radio as the dominant broadcast medium in the 1950s. With only a handful of channels, television was a unifying experience. Most people watched the same shows and news programs, leading to a shared cultural experience and a sense of unity and commonality. The limited sources of televised media contributed to a higher level of trust in the media, as viewers had fewer alternatives and generally accepted the information provided by these channels as accurate.

Baby Boom Generation (Born 1946–1964; Adolescents in the 1960s–early 1980s)

As military troops returned after World War II, couples and families were reunited and a "boom" of babies were born. The Baby Boom Generation, born between 1946 and 1964, were children during a period of unprecedented economic growth and prosperity following the end of World War II. The middle class expanded rapidly, homeownership rose, and suburban neighborhoods were created. The increase in disposable income led to a surge in consumerism, with new products and marketing shaping baby boomers' attitudes toward consumption and material wealth (Twenge, 2023). Most baby boomers grew up in traditional family structures and gender roles, often within nuclear families with a stay-at-home mother and a breadwinner father. Postwar economic stability also allowed for better funding for public education and increased access to higher education, improving this generation's career prospects and enabling upward social mobility. They entered the workforce with a strong work ethic and high expectations for job security, career advancement, and financial success.

Economically and socially stable childhoods fostered a sense of optimism in the Baby Boom Generation. As adolescents in the 1960s through the early 1980s, they focused on personal freedom and growth (Munger, 2022). They had the freedom to rebel against traditional norms, experimented with substances, and engaged in social and political activism, fueling the civil rights movement, feminism, environmentalism, and opposition to the Vietnam War. Shared experiences, such as the Beatles

"invasion," and limited television sources led to a strong sense of collective identity and a belief that their generation was unique and distinct from previous ones. Iconic events like the moon landing and Woodstock further reinforced this sense of optimism and uniqueness.

Generation X (Born 1965–1980; Adolescents in the 1980s–1990s)

Generation X, born between 1965 and 1980, experienced economic, social, technological, and political shifts that shaped their development. Gen Xers faced economic instability early in life, growing up during the 1970s, 1980s, and 1990s recessions and witnessing the 1987 stock market collapse. The increase in dual-income families, single-parent households, and divorce rates led many Gen X children to become "latchkey kids," often returning to an empty home after school.

As adolescents in the 1980s and 1990s, Generation Xers witnessed the first space shuttle flight in 1981 and the *Challenger* explosion in 1986. The emergence of the AIDS epidemic in the 1980s led to widespread safe-sex campaigns. The U.S. government's War on Drugs and the associated "Just Say No" campaigns also marked this era. As children during the Cold War, Gen Xers lived with the fear of nuclear war, a fear that eased with the end of the Cold War, symbolized by the fall of the Berlin Wall in 1989 and the collapse of the Soviet Union in 1991. Economic and social uncertainties, such as soaring college tuition rates in the 1980s, fostered a sense of skepticism and even pessimism (Twenge, 2023). Generation X was the first generation to grow up with personal computers, modern video games, cable television, and access to the internet. The launch of MTV, which broadcasted music videos 24 hours a day, became a significant cultural influence on this generation, because it was media explicitly directed to them as adolescents. Generation X is known for its independence, skepticism, and self-reliance.

Millennials (Born 1981–1996; Adolescents in the 1990s–early 2010s)

The Millennial Generation, born 1981–1996, experienced economic and social instability as children. They witnessed the recessions of the 1980s and early 1990s, followed by a period of prosperity in the late 1990s, driven by the rise of internet and technology companies. This prosperity ended abruptly with the dot-com bubble burst in 2000–2002 and the recession following the 2001 terrorist attacks. As adolescents in the 1990s through the early 2010s, millennials witnessed many significant events, including the Oklahoma City bombing in 1995, the death of Princess Diana in 1997, the Columbine school shooting in 1999, and the 9/11 terrorist attacks in 2001. These events contributed to a heightened sense of vulnerability and awareness of global issues.

The Millennial Generation was the first to grow up with widespread access to mobile phones and the internet, giving them more access to national and global information than previous generations. Social media emerged in the mid-2000s with the launch of Facebook in 2004. Millennial adolescents were among the first to use social media platforms, permitting an unprecedented ability for instant mass communication. They were socially conscious, promoted awareness, and advocated environmental causes like climate change and human rights, including racial equality (Tyson et al., 2021). During the 1990s, the LGBTQ+ (lesbian, gay, bisexual, queer, and other nonheterosexual identities) community became increasingly visible, and millennials advocated for acceptance, antibullying policies, events like Pride parades, and organizations such as the Gay-Straight Alliance (GSA) in schools. A growing awareness of mental health issues in the 2000s led to destigmatizing health problems such as depression and anxiety (Twenge, 2023). As adults, the millennial generation advocates work-life balance and tends to value experiences over material goods.

Generation Z (Born 1997–2012; Adolescents in 2010s–2020s)

Generation Z, born between 1997 and 2012, is the first generation to grow up entirely in the digital age, with high-speed internet, smartphones, and social media from birth. Safety and security were prominent concerns from their birth, following the 2001 terrorist attacks and multiple school shootings, including the 2012 Sandy Hook school shooting and the 2018 Parkland school shooting. As mental health awareness increased, parents and schools prioritized their physical and emotional safety. The COVID-19 pandemic, beginning in 2020, shaped Gen Z's formative years, as the youngest members were in elementary school and the oldest were emerging adults when it began. Many had to adapt to

virtual classrooms and social isolation, losing contact with friends just as peers became more important. The pandemic brought overlapping educational, economic, and family stresses.

Generation Z's constant connectivity influences their communication styles, social interactions, and access to information. They heavily rely on social media for self-expression, creativity, and connection. However, it also brings challenges like cyberbullying, social comparison, and pressure to maintain a perfect online image. Compared to previous generations, Gen Zers experiences higher rates of anxiety, depression, and stress but are more aware of and likely to seek help (Cox et al., 2023). This generation is characterized by a strong sense of social awareness and activism. They are deeply concerned about climate change, social justice, and equality and use social media to advocate regarding these issues (Tyson et al., 2021). The most diverse generation in history, Gen Z prioritizes inclusivity and acceptance, challenging traditional ideas about gender, sexuality, and ethnicity (Igielnik, 2020). Gen Z pushes for representation and authenticity.

Generation Alpha (Born 2010–2025; Adolescents in 2020s–2030s)

The oldest members of Generation Alpha (born 2010–2025) are about 14 years old as of this writing. Note the overlap in birth years between Generation Z (1997–2012) and Generation Alpha (2010–2025), highlighting the difficulty in determining when one generation ends and another begins. The youngest members of Gen Alpha are in their infancy. It is, therefore, difficult to predict what Gen Alpha will experience during adolescence. The oldest members were in elementary school during the COVID-19 pandemic; they likely experienced virtual school and the corresponding reduced in-person peer interaction in childhood. Growing up in a fully digital world, Gen Alpha is expected to continue Gen Z's emphasis on inclusivity, environmental consciousness, mental health, and civic engagement. What sociohistorical factors will influence Gen Alpha? Only time will tell.

Table 1.1 ▪ Generations

Generation	Birth Years	Adolescence Period
Silent Generation	1928–1945	1940s–early 1960s
Baby Boomers	1946–1964	1960s–early 1980s
Generation X	1965–1980	1980s–1990s
Millennials	1981–1996	Late 1990s–early 2010s
Generation Z	1997–2012	2010s–2020s
Generation Alpha	2013–Present	2020s–2030s (anticipated)

Review

1. What is a cohort?
2. Why are experiences during adolescence particularly powerful for defining generations?
3. What are some characteristics and differences among members of living cohorts?

Thinking in Context

1. What generations are you, your parents, and your grandparents members of? Identify characteristics of each generation. How well do these characteristics match you, your parents, and your grandparents? How might you account for the similarities? Differences?
2. Consider the past year. What major events have occurred? Consider natural events, political events, scientific advances, popular media releases and events. In a few sentences, explain

the sociohistorical context that you experience today. Consider a young adolescent. What might these factors mean for their experience?

3. What generational stereotypes can you identify? How might the sociohistorical context influence those stereotypes? What stereotypes can you identity for your generation? How accurate are they?

Apply

Born in 2012, Kyle spends much of his time maintaining his active social media accounts, which play a central role in his daily life. For Kyle, social media is not only a means of staying connected with friends but also a platform for self-expression, creativity, and staying informed about current events. His parents, born in the 1970s, use social media less frequently. Kyle's parents tend to rely on more traditional media and often consult established news sources or personal networks for information rather than social platforms. They remind Kyle to be cautious of privacy concerns and the possible spread of misinformation.

1. How might the sociohistorical contexts Kyle and his parents experienced in adolescence account for differences in their media habits?
2. What other generational differences might you expect to see between Kyle and his parents, considering the historical events and cultural shifts each experienced during adolescence?

Biology-Context Interactions and Adolescent Development

1.5 Examine biology-context interactions in development, including gene-environment correlations, gene–environment interactions, and epigenetics.

As we have discussed, development results from our interactions in the many contexts and circumstances in which we are embedded. However, development is not entirely contextual. Biology also matters, and development reflects their interaction. Each of the cells in our body carries **genes**, the basic units of heredity, composed of stretches of **deoxyribonucleic acid (DNA)**, a complex molecule shaped like a twisted ladder or staircase. Genes contain the plan for creating all the traits that organisms carry (Taneri et al., 2020). Genes inherited from our biological parents influence all of our characteristics, from hair and eye color to personality, health, and behavior. But genes do not work alone. All traits, even those with a strong genetic component, such as height, are modified by environmental influences (Jelenkovic et al., 2016; Plomin, 2019). For example, healthy nutrition (an environmental factor) can promote children's growth, while malnutrition can stunt growth.

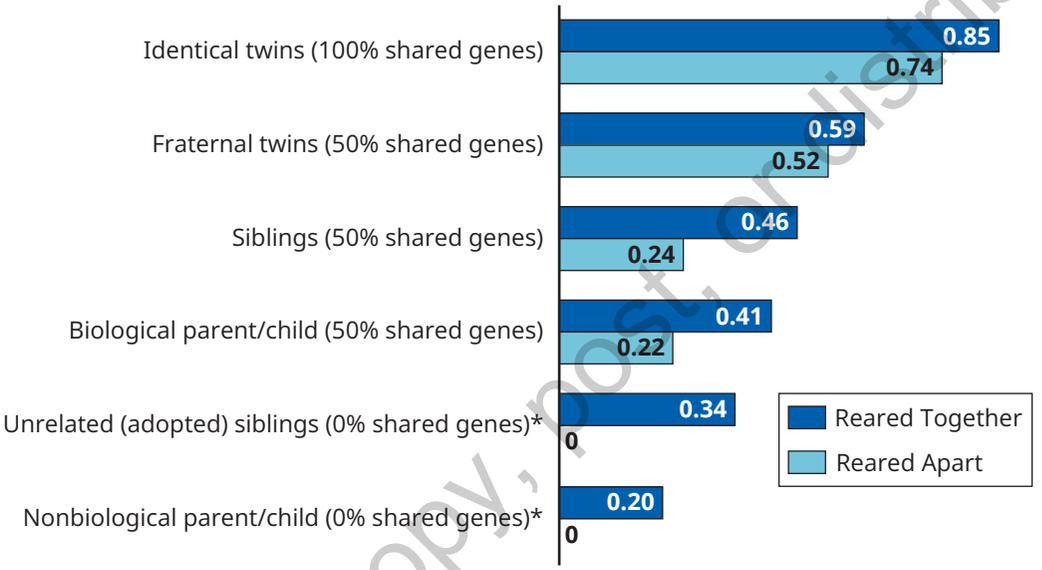
Behavior Genetics

Behavior genetics is the study of how genetic and environmental factors influence the characteristics people show, including their dispositions, abilities, and behavior (Barry et al., 2023; Fowler-Finn & Boutwell, 2019; Harden, 2021). Behavior geneticists attempt to tease apart the role of biology and environment. They study people who vary in relatedness (genetics) and household (environment). For example, they compare siblings of varying relatedness reared together and sharing a home environment, including identical twins who share 100% of their genes, fraternal twins who share only 50%, and adopted children who share no genes. If genes influence a given attribute, identical twins should be more similar than fraternal twins and fraternal twins more similar than adopted siblings. In turn, the degree to which genetically unrelated adopted children reared together are similar speaks to the role of environment.

Behavior genetic research has shown that genes contribute to many traits, including sociability, temperament, emotionality, and susceptibility to various conditions such as obesity, heart disease, cancer, anxiety, poor mental health, and a propensity to be physically aggressive (Ask et al., 2021; Gunther et al., 2020; Isen et al., 2022; Li-Gao et al., 2022; Loos & Yeo, 2022). Identical twins consistently have more similar intelligence scores than fraternal twins (Plomin, 2019).

A classic behavior genetics study compared intelligence test scores among kin who varied in relatedness and environment (Plomin & Spinath, 2004). As shown in Figure 1.3, intelligence scores are most similar for identical twins reared together and, to a lesser extent, for identical twins reared apart, suggesting a genetic contribution. Scores decline as kin share fewer genes and are reared apart. Notice that kin who live together have more similar scores than those who live apart, illustrating the role of environment. Even identical twins who share 100% of their genes are not 100% alike. Those differences are due to the influence of environmental factors unique to each sibling.

Figure 1.3 ▪ Intelligence Scores for Kin With Varying Genetic Relatedness and Environmental Similarity



*Estimated correlation for individuals sharing neither genes nor environment = .0

Sources: Adapted from Bouchard & McGue, 1981; Devlin et al., 1997.

Siblings may be raised in the same house by the same parents, sharing an environment and many everyday experiences. Despite a shared environment, siblings, even twins, are often very different in personality, interests, and competencies. In addition to heredity, behavior geneticists point to environmental factors, specifically the **nonshared environment**, as a contributor to differences among siblings (Hetherington et al., 2013). The nonshared environment refers to experiences that are unique to a particular child. Siblings are often treated differently. The oldest sibling often has a very different parenting and family experience than the youngest child. Parents gain experience and knowledge about child development and child-rearing with each child, which might influence their confidence and parenting. In addition, parent-child interactions are influenced by children's personalities, leading to unique experiences for each child. A shy child might elicit different reactions from a parent than a very outgoing child.

Even twins who share the womb and a birthday have a nonshared environment—different friends, activities, teachers, and interactions with parents that are influenced by their unique personalities and characteristics. The nonshared environment contributes to many of the differences we see among siblings and interacts with genetics to influence children's development.

Gene-Environment Interactions

At 6 feet 2 inches, 16-year-old Deondre towers over his 5-foot-tall mother and is substantially taller than his father, who is 5 feet 11 inches. Why is Deondre so much taller than his biological parents? Shared genes account for only part of the story of development. As we have discussed, genes and the environment work together in complex ways to determine our characteristics, behavior, development, and health (Morgan et al., 2020; Ritz et al., 2017). **Gene-environment interactions** refer to the dynamic interplay between our genes and our environment. Several principles illustrate these interactions and can help us understand differences among family members.

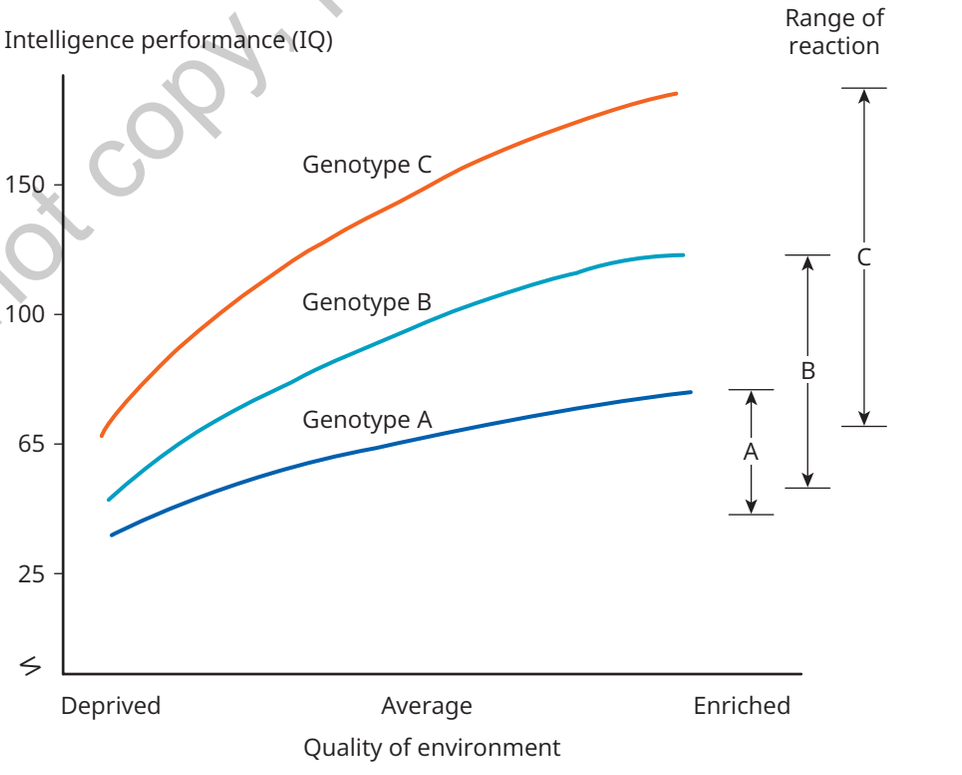
Range of Reaction

The effects of the environment vary with the individual's genetic makeup (Briley et al., 2019). Everyone has a different genetic makeup and therefore responds to the environment in a unique way. In addition, genes can be expressed in a variety of ways. There is a **range of reaction** (see Figure 1.4), and there are a wide range of potential expressions of a genetic trait depending on environmental opportunities and constraints (Gottlieb, 2007).

Consider height. Height is largely a function of genetics, yet an individual may show a range of sizes depending on the environment and behavior (Jelenkovic et al., 2016; Thompson, 2021). Children born to two very tall parents may have the genes to be tall. However, they will not fulfill their genetic potential for height unless they have adequate nutrition. In societies where nutrition has improved dramatically over a generation, it is common for adolescents to tower over their parents. Enhanced environmental opportunities, such as nutrition, enable children to meet their genetic potential for height.

Therefore, our genetic makeup sets boundaries on the range of possible outcomes for a given trait, and our environment influences the outcome within that range (Manuck & McCaffery, 2014; Morgan et al., 2020). Gene-environment interactions are complex and often difficult to predict, partly because

Figure 1.4 ▪ Range of Reaction



Source: Adapted from Gottlieb, 2007.

individuals vary in their sensitivity to environmental stimuli. An adolescent's genetic makeup can make them more sensitive to environmental stimuli or particular stimuli than others (Briley et al., 2019; Harden, 2021).

Gene-Environment Correlation

We have seen that heredity and environment each contribute to development. Not only do they interact, but environmental factors often support hereditary traits (Briley et al., 2019; Scarr & McCartney, 1983). **Gene-environment correlation** refers to the finding that many genetically influenced traits tend to be associated with environmental factors that promote their development (Saltz, 2019). That is, genetic traits often influence children's behavior, which is then supported or encouraged by the environment (Neiderhiser & Chen, 2023). There are three types of gene-environment correlations—passive, reactive, and active.

Passive gene-environment correlation. Adults naturally create home environments that support their preferences and traits. Because parents are genetically similar to their children, the homes they create may also correspond to their child's genetic disposition—an example of a *passive gene-environment correlation* (Cheesman et al., 2020). Consider a child who is naturally sociable and born to parents with a similar, sociable, disposition. Sociable outgoing parents tend to create home environments that encourage social interactions, such as by hosting gatherings and encouraging children to participate in group activities. This is an example of a passive gene-environment correlation, because the child's home environment happens to support their disposition. Passive gene-environment correlations are expected early in life because parents create rearing environments for their infants and young children

Evocative gene-environment correlation. People naturally evoke responses from others and the environment, just as the environment and the actions of others evoke reactions from the individual. In an *evocative gene-environment correlation*, a child's genetic traits influence their social and physical environment, which shapes their development in ways that support the genetic trait (Shewark et al., 2021). Considering the previous example, a child with a genetic predisposition for sociability tends to be outgoing and friendly, positively engaging with others. This sociable behavior evokes positive responses from others, such as making friends and being invited to parties and social events, which in turn supports the child's outgoing behavior. In this way, the child's trait leads them to behave in ways that influence the physical and social environment, drawing responses that support and promote the trait.

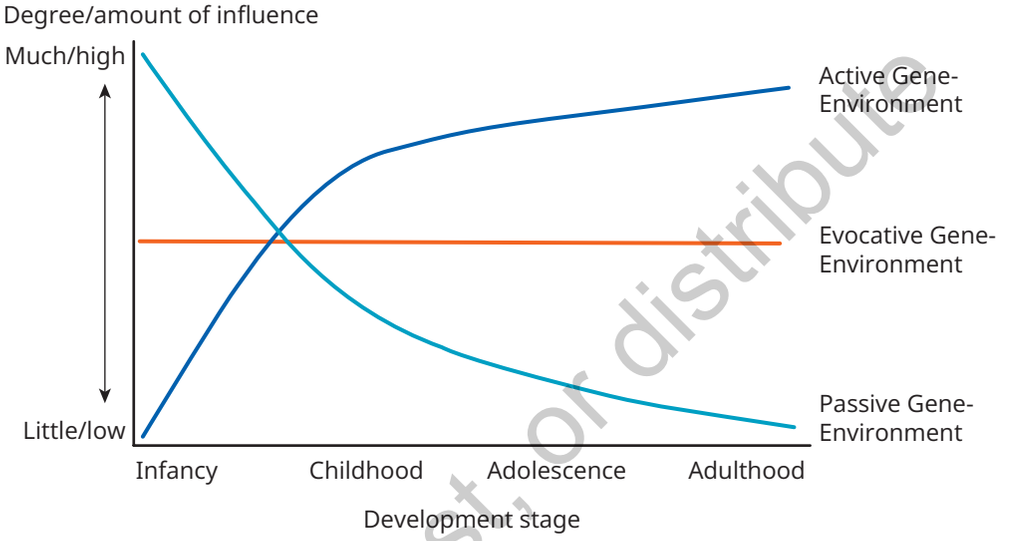
Active gene-environment correlation. Children also take a hands-on role in shaping their development. As children grow older, they have increasing freedom in choosing their own activities and environments. An *active gene-environment correlation* occurs when the child creates experiences and seeks environments that correspond to and support their genetic predisposition (Perlstein & Waller, 2022). The child with a genetic trait for sociability actively seeks out experiences and environments where they can interact with others. They might join clubs, participate in team sports, attend social events, and spend time with friends. By choosing these social environments, the adolescent creates opportunities to develop their social skills further and build relationships, reinforcing their sociable nature. This tendency to actively seek out experiences and environments compatible with and supportive of our genetic tendencies is called **niche-picking** (Saltz, 2019; Scarr & McCartney, 1983).

Developmental shifts in gene-environmental correlations. The strength of passive, evocative, and active gene-environment correlations changes with development, as shown in Figure 1.5 (Lynch, 2016; Scarr, 1992). Passive gene-environment correlations are common at birth, as caregivers determine infants' experiences. Correlations between their genotype and environment tend to occur because genetically similar parents make their environments (Armstrong-Carter et al., 2021). Evocative gene-environment correlations also occur from birth, as infants' inborn traits and tendencies influence others, evoking responses that support their own genetic predispositions.

In contrast, active gene-environment correlations become common as children grow older and more independent. As they become increasingly capable of controlling parts of their environment, they engage

in niche-picking by choosing their interests and activities, shaping their development. Niche-picking contributes to the differences we see in siblings, including fraternal twins, as they grow older. Interestingly, identical twins tend to become more similar over time, perhaps because they are increasingly able to select the environments that best fit their genetic propensities (contributing to a shared environment). As adults, identical twins—even those reared apart—tend to become alike in attitudes, personality, cognitive ability, strength, mental health, and preferences, and they tend to select similar spouses and best friends (McGue & Christensen, 2013; Plomin & von Stumm, 2018; York, 2020).

Figure 1.5 ▪ Gene-Environment Correlations Over the Lifespan



Gene-Environment (G x E) Interactions

Despite our growing understanding of genetic influences on behavior, the characteristics people ultimately show are often unpredictable (Flint et al., 2020). Not only do the effects of genes vary with environmental influences, but not all genotypes respond to environmental influences in the same way (Fowler-Finn & Boutwell, 2019; Harden, 2021).

In a classic longitudinal study, boys who experienced trauma and abuse were at risk of showing developmental and behavioral problems (Caspi et al., 2002). Their adaptation varied depending on the presence of a gene that controls monoamine oxidase A (MAOA), an enzyme that regulates specific chemicals in the brain. Maltreated boys were about twice as likely to develop problems with aggression and violence and to even be convicted of a violent crime—but only if they carried the low-MAOA gene. Maltreated boys who had the high-MAOA gene were no more likely to become violent than nonmaltreated boys. In addition, the presence of the low-MAOA gene itself was not associated with violence, but it predicted violence only for boys who had experienced abuse early in life. These findings have been replicated in another 30-year longitudinal study of boys (Fergusson et al., 2011) as well as a meta-analysis of 27 studies (Byrd & Manuck, 2014).

Similar findings of an MAOA gene environment interaction in which low MAOA, but not high MAOA, predicts adverse outcomes in response to childhood adversity have been extended to include other mental health outcomes such as antisocial personality disorder and depression (Dash et al., 2023; Manuck & McCaffery, 2014; Mariz et al., 2022). Many of these studies have examined only males. Females show a more mixed pattern, with some studies showing that girls display the MAOA gene environment interaction influence on emotional reactivity and aggression but to a much lesser extent than boys, whereas other studies suggest no relationship (Byrd et al., 2018). Other genes interact with the environment in similar ways. For example, the 5-HTTLPR gene interacts with environmental factors to influence parenting sensitivity, depression, stress, and responses to trauma (Baião et al., 2020; Li et al., 2013).

Just as some genes increase our susceptibility to environmental risks, others might increase our sensitivity to, and therefore the effectiveness of, environmental interventions (Bakermans-Kranenburg & van IJzendoorn, 2015; Chhangur et al., 2017). The effects of genes vary with environmental influences, and not all genotypes respond to environmental influences in the same way (Fowler-Finn & Boutwell, 2019). Moreover, most human traits, such as intelligence, are influenced by multiple genes, each of which has multiple variants that can each interact with the environment in different ways (Armstrong-Carter et al., 2021; Briley et al., 2019; Plomin et al., 2016).

We have learned a great deal about how our genes and environments work together to influence our development. However, it is worth noting that these conclusions pertain to populations, large groups of people, and not to specific individuals. Conclusions from behavior genetics research cannot predict individual behavior (Turkheimer, 2019). In addition, behavior genetics research, like many other areas of research, is based on samples that are not diverse. Ethnically diverse samples and those of low socioeconomic status are underrepresented in behavior genetics research, limiting the conclusions that we can draw (Sirugo et al., 2019). Although we have learned much about behavior genetics, the genetics of most traits are still poorly understood (Brandes et al., 2022).

Epigenetic Framework

By now, it is clear that development is the product of a dynamic interaction of biological and contextual forces. Recently, scientists have determined that environmental factors do not simply interact with genes to determine people's traits. Environmental factors can determine *how* genes are expressed through a process known as **epigenetics** (Carlberg & Molnar, 2019; von Lüpke, 2021). The epigenome is a molecule that stretches along the length of DNA and provides instructions to genes, determining how they are expressed and whether they are turned on or off. The epigenome carries instructions that determine what each cell in your body will become, whether heart, muscle, or brain. Those instructions are carried out by directing genes to turn on and off (O'Donnell & Meaney, 2020).

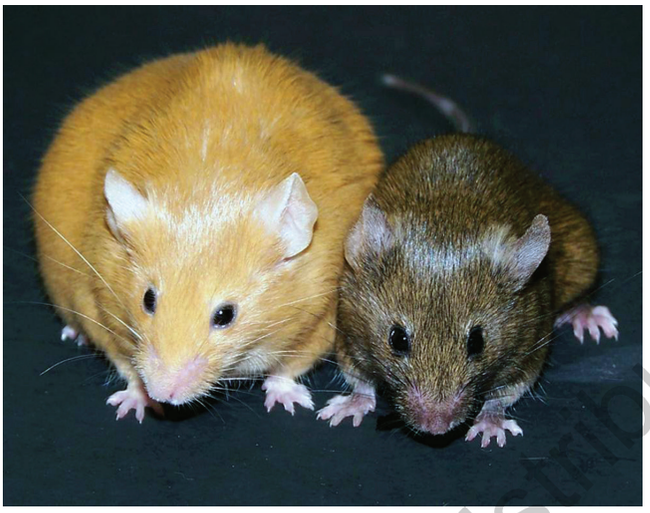
At birth, each cell in our body turns on only a fraction of its genes. The epigenome instructs genes to be turned on and off over the course of development and also in response to the environment (Paro et al., 2021). Epigenetic mechanisms determine how genetic instructions are carried out to determine the phenotype—the characteristics shown (Pinel et al., 2018). Environmental factors such as toxins, injuries, crowding, diet, and responsive parenting can influence the expression of genetic traits through epigenetic mechanisms (O'Donnell & Meaney, 2020). These processes were first discovered in animals.

Epigenetic Processes in Animals

One of the earliest examples of epigenetics is the case of agouti mice, which carry the agouti gene. Mice that carry the agouti gene have yellow fur, are extremely round and obese, and are prone to diabetes and cancer. When agouti mice breed, most of the offspring are identical to the parents—yellow, obese, and susceptible to life-shortening disease. A groundbreaking study showed that yellow agouti mice can produce offspring that look very different (Waterland & Jirtle, 2003). The mice in Figure 1.6 both carry the agouti gene, yet they look very different; the brown mouse is slender, is lean, has a low risk of developing diabetes and cancer, and is likely to live well into old age. Why are these mice so different? Epigenetics. In the case of the yellow and brown mice, the phenotype of the brown mouse has been altered, but the DNA remains the same. Both carry the agouti gene, but the agouti gene is always turned on in the yellow mouse. In the brown mouse, it is turned off.

How is the agouti gene turned on or off? An environmental factor is at play here: The pregnant female's diet, specifically the presence of chemical clusters that attach to, or mark, the gene, determines the offspring's phenotype (Waterland & Jirtle, 2003). These chemical clusters are found in many foods, such as onions, garlic, beets, soy, and the nutrients in prenatal vitamins. Yellow agouti mothers fed a diet high in these chemical clusters passed along the agouti gene to their offspring, but the presence of epigenetic marks (the chemical clusters) turned it off. Despite carrying the gene, the offspring looked radically different from the mothers (brown instead of yellow) and were healthier (lean, not susceptible to disease).

Figure 1.6 ▪ **These two mice are genetically identical. Both carry the agouti gene, but it is turned on all the time in the yellow mouse and turned off in the brown mouse.**



Epigenetic Processes in People

Epigenetic processes also influence human development. Just as in animals, the environment can affect the human epigenome before birth. The epigenome can even be transmitted from one generation to the next through epigenetic marks passed on ova and sperm (Ghai & Kader, 2022; Legoff et al., 2019). For example, a recent study of nearly 130,000 families found an epigenetic relationship between adults' health behaviors before becoming parents, including substance use, poor diet, and obesity, and their offspring's mental health (Monaco, 2021). This means that what you eat and do today could affect the epigenome of your descendants, including the development, characteristics, and health of your children, grandchildren, and great-grandchildren (Breton et al., 2021; Ghai & Kader, 2022; Grover & Jenkins, 2020).

The epigenome is also influenced by our experiences after birth. Early exposure to trauma and adversity can reprogram children's and adolescents' development, leading to an earlier onset of puberty (Hamlat et al., 2021) and accelerated aging (Kim et al., 2023; Raffington et al., 2021). The quality of maternal caregiving predicts epigenetic changes linked with socioemotional development and adjustment to adversity (Mariani Wigley et al., 2022; Provenzi et al., 2020). Experiences can place epigenetic marks on genes that influence our physical, cognitive, and socioemotional competencies, including our physical and mental health (Cecil et al., 2023; O'Donnell & Meaney, 2020; Raffington et al., 2023).

Epigenetic processes influence development for all people, at all ages, and in all environments. To date, most epigenetic research has focused on exposure to adversity, but epigenetic processes also support resilience (Smeeth et al., 2021). Interactions between heredity and the environment change throughout development, as does the role we play in constructing environments that support our genotypes, influence our epigenome, and determine who we become (Lickliter & Moore, 2023; Lickliter & Witherington, 2017). Where possible, we will examine the role of epigenetics in adolescent development throughout this book.

Review

- What is behavior genetics?
- Describe three types of gene-environment correlations.
- Discuss gene × environment interactions and the range of reaction.
- Describe epigenetics.

Thinking in Context

Give personal examples of a passive gene-environment correlation, an evocative gene-environment correlation, and an active-gene environment correlation. Which types of gene-environment correlations do you most commonly encounter?

Apply

"You're born with all your traits and characteristics. You're *you* from birth. Everything shows up as you grow, but it's already there, like a seed, when you're born," Masai explains to his friend.

Joao good-naturedly argues, "No way! I'm *me* because of my experiences, my family, and my friends. I wouldn't be *me* without them."

1. Do you agree with Masai or Joao? Why?
2. What would a scientist who favors behavior genetics say? Epigenetics?

Chapter Summary

1. **Define adolescence, its stages, and the characteristics of emerging adulthood.**

   Adolescence refers to the transition from childhood to adulthood, including early adolescence (ages 10 to 14), middle adolescence (ages 14 to 16), and late adolescence (ages 16 to 18). Social changes have shifted the boundaries of both adolescence and adulthood. Today's young people reach traditional milestones of adulthood, such as finishing their education, starting a career, and starting a family, at later ages than ever before. Emerging adulthood (ages 18 to 25) is a distinct phase between leaving adolescence and adopting adult roles. Emerging adults have an "in-between" status, experience instability and diversity in their lifestyles, and focus on identity development. While observed in many countries, emerging adulthood is not universal. Some researchers argue that it is the result of the educational and career opportunities associated with medium to high socioeconomic status. Finally, adults of all ages endorse many features of emerging adulthood, although to a lesser extent than emerging adults, suggesting that the characteristics of emerging adulthood are not unique to this age period.

2. **Discuss the historical origins of adolescence and evidence for popular stereotypes about adolescents.**

   Although philosophers described the period of adolescence, adolescents were treated much like adults until the 19th century. Several social changes that occurred from 1890 to 1920, including the Industrial Revolution and compulsory education, led to the concept of adolescence as we know it today. G. Stanley Hall is credited with beginning the scientific study of adolescence. Hall believed that adolescence was characterized by universal upheaval, storm and stress. However, current research suggests turmoil is not universal nor healthy. According to Margaret Mead, adolescence is culturally constructed, varying across cultures. Today most researchers hold a modified storm-and-stress view in which problems are more likely to emerge during adolescence but are not inevitable. Despite this, many adolescents and adults subscribe to stereotypes that can create harmful self-fulfilling prophecies.

3. **Describe the developmental processes, tasks, and contexts of adolescence and the role of intersectionality in adolescent development.**

   Developmental changes are multidimensional, including physical development (body maturation), cognitive development (maturation of thought processes), and socioemotional development (emotional maturation, understanding of relationships, and social competence). Changes in one area spill over and trigger changes in others, a concept called developmental cascades. Adolescents face several interacting developmental tasks or challenges that influence adjustment. They must form a sense of self (identity); govern their emotions, values, and behavior (autonomy); learn how to form and sustain close relationships (intimacy); and

understand and express sexual feelings and behaviors (sexuality). Adolescent development is influenced by its context, that is, where and when a person develops, including their physical and social environment. Adolescents participate in many interacting contexts: home, school, peer, neighborhood, online, cultural, and sociohistorical contexts. Development is also influenced by intersectionality—the complex interplay of identities related to gender, race and ethnicity, sexual orientation, and social factors such as socioeconomic status and disabilities.

4. **Analyze the role of sociohistorical context in adolescent development.**

   The time when we live and its unique historical events and trends influence our development. Contextual influences tied to specific historical eras explain cohort differences in beliefs, attitudes, and behaviors. Generations are marked by the specific sociohistorical factors that individuals encounter as they come of age, particularly during adolescence. These differences tend to persist into adulthood, creating distinct generational identities. While we identify generations by years, the boundaries are flexible, and there is overlap. There are individual differences, and not everyone shows the characteristics associated with their generation. Today's living generations include the Silent Generation, Baby Boom Generation, Generation X, Millennial Generation, Generation Z, and Generation Alpha. Each of these generations was shaped by the unique social, economic, political, cultural, and historical events of their childhood and adolescence.

5. **Examine biology-context interactions in development, including gene-environment correlations, gene-environment interactions, and epigenetics.**

   Behavior genetics is the study of how genetic and environmental factors influence the characteristics people show. The nonshared environment, experiences that are unique to a particular child, contributes to differences among siblings. Gene-environment interactions refer to the dynamic interplay between our genes and our environment. Genetic traits each have a range of reaction, a wide variety of potential expressions, depending on environmental opportunities and constraints. Genetically influenced traits are often associated with environmental factors that promote their development (gene-environment correlations). There are three types of gene-environment correlations: passive gene-environment correlation, evocative gene-environment correlation, and active gene-environment correlation (niche-picking). Most human traits are influenced by multiple genes that interact with the environment in different ways. Environmental factors can determine how genes are expressed through epigenetics. Environmental factors such as toxins, injuries, crowding, diet, and caregiving quality can influence the expression of genetic traits through epigenetic mechanisms before and after birth.

Key Terms

adolescence
autonomy
behavior genetics
cognitive development
cohort
context
culture
deoxyribonucleic acid (DNA)
development
developmental cascades
developmental science
early adolescence
emerging adulthood
epigenetics
gene-environment correlation
gene-environment interactions
genes
identity
identity development
intersectionality
intimacy
late adolescence
middle adolescence
niche-picking
nonshared environment
physical development
puberty
range of reaction
sexuality
social policy
socioemotional development

Chapter 2

Theories and Research in Adolescent Development

Learning Objectives

- **2.1** Discuss four key questions that guide the study of adolescent development.
- **2.2** Summarize classic psychoanalytic and behaviorist theories and their approach to describing adolescent development.
- **2.3** Compare cognitive-developmental, information processing, sociocultural, and social cognitive theories.
- **2.4** Discuss bioecological systems theory and dynamic systems theory.
- **2.5** Describe methods and designs used to study adolescent development.
- **2.6** Examine developmental scientists' ethical responsibilities when conducting research.

I hang out with my friends every day after school, but lately I've been feeling like I don't fit in. We used to like the same stuff, but now I don't know. It feels different.

—Ryan, 13 years old

It's like one day I feel super confident, and the next day I'm just not. I used to be really small, but I got big quick. It's good that everyone wants me on their team, but I get stressed out before games and it messes with my performance. I wonder what everyone thinks. I know I should focus on what makes me happy, but it's hard when everyone's watching.

—Toby, 15 years old

I really care about what's going on in the world, especially the environment. We only have one world and we're destroying it. Last year, I didn't even think about the environment. I didn't know. Now I've joined this club at school to push for big changes in environmental policies. It feels good to actually do something, but it's frustrating because adults don't seem to listen to us.

—Kimberlynn, 17 years old

Adolescence and change go hand in hand. Each of these adolescents is undergoing a transformation that involves their bodies, minds, emotions, and relationships. Several principles and theories can describe and account for these changes. In this chapter, we examine basic questions about adolescent development, theories that describe adolescent development, and ways of studying adolescent development.

Core Concepts and Questions About Adolescent Development

2.1 Discuss four key questions that guide the study of adolescent development.

Think back to your adolescence. How did you change? Were the changes quick and unpredictable or more gradual? What caused these changes? Developmental scientists study several core issues—basic questions about adolescent development, such as:

- How do biology and the environment influence development?
- Is developmental change gradual or abrupt?
- How do adolescents influence their own development?
- Is there one developmental path or many?

Nature and Nurture: How Do Biology and the Environment Influence Development?

Perhaps the oldest question about development concerns its origin. Often referred to as the **nature-nurture debate**, researchers once asked whether development is most influenced by biological factors ("nature") or environmental factors ("nurture"). Explanations that rely on biology point to inborn genetic traits and maturational processes as causes of developmental change. In contrast, proponents of environmental explanations view children and adolescents as molded by the physical and social environment in which they are raised.

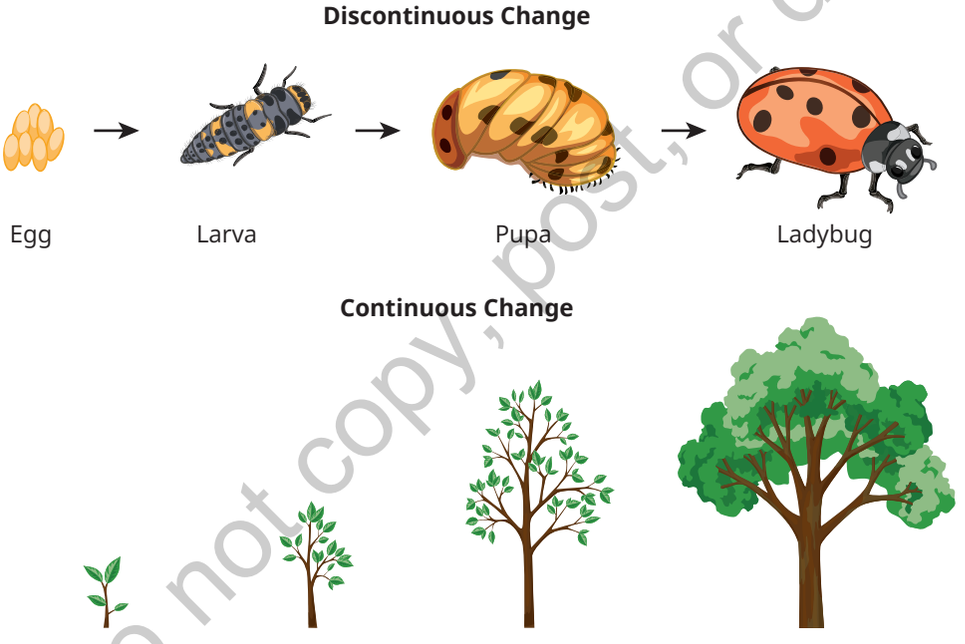
While the nature-nurture debate appears to present biology and environment as alternative explanations for development, the predominant view today is that both biology and environment play roles in development. The question is, how do they work together to influence child development (Bjorklund, 2018)? Gene-environment interactions, discussed in Chapter 1, illustrate the complex interacting contributions of biological and environmental influences on development (Fowler-Finn & Boutwell, 2019). Epigenetics, also discussed in Chapter 1, represents the most contemporary view

of the nature-nurture question. We are born with genes whose expression depends on environmental factors (von Lüpke, 2021). Whether and the degree to which genetic predispositions, such as anxiety or depression, are fulfilled depends on environmental factors like stress, nutrition, and healthcare (Lin & Tsai, 2020; Talarowska, 2020).

Continuity and Discontinuity: Is Developmental Change Gradual or Abrupt?

Do children slowly grow into adolescents and adolescents into adults, steadily gaining more knowledge and experience and becoming better at reasoning? Or do they grow in spurts, showing sudden, large gains in knowledge and reasoning capacities? The **continuity-discontinuity** issue contrasts two views of the nature of development. One view of development is that it unfolds slowly and gradually over time, demonstrating continuous change. Continuous change is quantitative and additive. From this perspective, development entails linear change, adding and refining more skills and abilities. Discontinuous change, on the other hand, is abrupt or stagelike. Changes are dramatic transformations and are qualitative, or changes in type or kind. As shown in Figure 2.1, a discontinuous view of development emphasizes sudden transformation, whereas a continuous view emphasizes gradual and steady changes.

Figure 2.1 ▪ Continuous and Discontinuous Change



Source: Adapted from Lampl et al., 1992.

It was once believed that development was either continuous or discontinuous—but not both. Today, developmental scientists agree that development includes both continuity and discontinuity (Lerner et al., 2014). Whether a particular developmental change appears continuous or discontinuous depends partly on our point of view. Consider physical growth. We often think of increases in height as involving a slow, steady, linear process, but with puberty, we see spurts and sudden dramatic increases that may seem stagelike. Puberty itself may seem like a sudden transformation, but the hormonal changes that underlie it gradually build (Spaziani et al., 2021). Thus, whether a given phenomenon, such as height, is described as continuous or discontinuous can vary depending on perspective. Most developmental scientists agree that some aspects of development are best described as continuous and others as discontinuous (Miller, 2016).

The Active Individual: How Do Individuals Influence Their Development?

Adolescents are not merely shaped by the physical and social contexts in which they live; they actively influence their own development by interacting with and altering those contexts (Elder et al., 2015). They contribute to their development through activities such as exploring their interests, engaging in social interactions, and navigating their environments (Lerner et al., 2014). For example, adolescents might actively seek opportunities to practice critical thinking by attending lectures, reading challenging texts, and debating with others, thereby advancing their cognitive development. This is similar to the concept of niche-picking in Chapter 1, where adolescents construct environments that nurture their interests and development.

Adolescents' influence extends beyond their actions to their characteristics, such as personality and appearance. Outgoing adolescents, for instance, naturally evoke sociable responses from others, while those with negative emotionality may unintentionally evoke negative responses (Clark et al., 2023). Similar to the concept of evocative gene-environment correlations from Chapter 1, adolescents' traits and characteristics naturally influence others and the environment around them, often without their awareness.

The prevailing view among developmental scientists is that individuals are active contributors to their own development (Lerner et al., 2014; Overton, 2015). While people are influenced by the physical and social contexts in which they live, they also actively shape their development by engaging with and transforming those contexts (Elder et al., 2015). By exploring the world around them, thinking critically, being curious, and interacting with peers, family members, and their environment, adolescents are "manufacturers of their own development" (Flavell, 1992). In essence, they play an active role in influencing how they grow and change.

Individual Differences: Is There One Developmental Path or Many?

When does puberty begin? How does self-esteem change? How does emotional control develop? What is typical behavior for a given age? Scientists who study questions about development obtain information about group averages, which is when most adolescents acquire particular abilities. The research findings we discuss throughout this book are based on studies that report averages on the typical adolescent. However, there is no typical adolescent. Adolescents vary in their developmental paths, with some closely following the group average while others take a markedly different course.

Developmental scientists study these averages while recognizing that each adolescent's path is unique. There are many developmental paths, and scientists seek to understand these individual differences and how children vary in their development. Individuals vary in the ages at which developmental changes occur, the rates of change, and their eventual abilities. They also seek to understand the factors that influence these individual differences, including genetics, environmental contexts, interactions among biological and genetic factors, and epigenetics. Adolescents also play an active role in their development, carving a unique developmental path through their interactions with people and contexts.

In sum, developmental scientists generally agree that nature and nurture contribute to development. Development may appear continuous or discontinuous depending on the lens or perspective. Individuals are active in their development, which is characterized by individual differences. Next, we consider theories of development and scientists' explanations for why adolescents act the way they do.

Review

- Describe the nature-nurture debate and the position most developmental scientists take.
- Explain the difference between continuity and discontinuity in development.
- How do adolescents influence their own development?
- What influences individual differences in development?

Thinking in Context

Consider your development.

1. How do your characteristics reflect biological and environmental influences?
2. Describe developmental changes you experienced that illustrate continuity in development. What about discontinuity?
3. How have you influenced your surroundings and development?
4. How was your development similar to and different from that of your friends? What influenced these similarities and differences?

Apply

Sixteen-year-old Monique has always been naturally gifted at running, just like her mother, who, at age 43, still runs marathons. Since moving to a neighborhood with sidewalks and a park and near the school track, Monique has enjoyed spending more time training. Last year her gym teacher noticed her skills and encouraged her to join the track team. With regular practice and support from her coach and family, Monique showed steady improvements and became the fastest runner on the team. Her teammate, Sarah, on the other hand, struggled to improve. She ran regularly with Monique and followed the same training plan but showed little improvement. Frustrated, Sarah tried adjusting her diet and sleep. Soon, Sarah's speed and endurance improved radically, seemingly overnight. Monique and Sarah continued to train together and finished nearly simultaneously at the next track meet.

1. How might Monique's natural abilities and her environment have influenced her development as a runner?
2. How does Monique's and Sarah's progress reflect continuity and discontinuity in development?
3. What factors might have contributed to the individual differences in Monique's and Sarah's development?
4. How do adolescents like Monique and Sarah take an active role in shaping their development?

Foundational Theories: Psychoanalytic and Behaviorist Theories

2.2 Summarize classic psychoanalytic and behaviorist theories and their approach to describing adolescent development.

A **theory** organizes a set of observations or facts into a comprehensive explanation of how something works. Theories are important tools for compiling and interpreting the growing body of research in developmental science, determining gaps in our knowledge, and making predictions about what is not yet known (Miller, 2022). An effective theory generates specific hypotheses or proposed explanations for a phenomenon that can be tested by research, as described later in this chapter. A good theory is *falsifiable,* meaning it can generate testable hypotheses. As scientists research and learn more, they modify their theories, test new hypotheses, and continue this process. Early understandings of development relied on two sets of theories, popular in the early to mid-1900s, with radically different views about the nature of human development and behavior.

Psychoanalytic Theory

A **Psychoanalytic theory** describes human development and behavior as driven by powerful inner forces beyond our conscious control. Freud and Erikson are two key psychoanalytic theorists whose theories remain influential today.

Freud's Psychosexual Theory

A Viennese physician, Sigmund Freud (1856–1939), is credited as the father of the psychoanalytic perspective. Freud argued that unconscious sexual and aggressive impulses drive our behavior. He described development as the progression through a series of *psychosexual stages*, periods in which unconscious sexual impulses focus on different parts of the body, making stimulation to those parts a source of pleasure (summarized in Table 1.1). Freud believed that the resolution of each stage and, ultimately, the adult personality is based on how parents gratify children's needs.

Freud explained that the task for parents is to strike a balance between overgratifying and undergratifying a child's desires at each stage to help the child develop a healthy personality with the capacity for mature relationships throughout life. During adolescence, Freud posed that young people enter the genital stage and basic unconscious drives focus on the genitals. Adolescents become concerned with sexuality and developing mature and satisfying sexual relationships. The genital stage is the final stage in Freud's scheme, suggesting that he viewed adolescents as similar to adults.

Notably, Freud's theory grew from his work with female psychotherapy patients; he did not study children (W. C. Crain, 2016). In part because of its heavy emphasis on childhood sexuality, Freud's psychosexual stage framework is not widely accepted (Westen, 1998). Yet some of Freud's ideas have stood up well to the test of time and have permeated popular culture, such as the notion of unconscious processes of which we are unaware, the importance of early family experience, and the role of emotions in development (Bargh, 2013). However, Freud's theory, including unconscious drives and psychosexual stages, is not falsifiable because its parts cannot be directly observed and tested (Miller, 2016). How can we study unconscious drives, for instance, when we are unaware of them?

Erikson's Psychosocial Theory of Development

Erik Erikson (1902–1994) was influenced by Freud, but he placed less emphasis on unconscious motivators of development. Erikson instead focused on interactions between the individual and their social world, including society and culture. Over their lifetimes, according to Erikson, people progress through eight *psychosocial stages* that include changes in how they understand and interact with others, as well as changes in how they understand themselves and their roles as members of society (Erikson, 1950). Each stage presents a unique developmental task, which Erikson referred to as a crisis or conflict that must be resolved. How well individuals address the crisis determines their ability to deal with the demands of the next development stage.

Erikson posited that adolescents face the crisis of identity versus role confusion when they must develop a sense of self by exploring various possibilities and committing to those that fit. Identity versus role confusion is perhaps the most well-known stage in Erikson's scheme. Unlike Freud, Erikson studied children, including larger and more diverse samples than Freud, and emphasized the role of the social world, including society and culture, in development. Although his theory is criticized as difficult to test, it has sparked research on specific stages, such as identity development during adolescence and emerging adulthood. We will discuss Erikson's ideas about identity in Chapter 5. Erikson's psychosocial theory is one of the first theories of adolescent development and the lifespan as a whole (W. C. Crain, 2016).

Freud and Erikson's stage theories are compared in Table 2.1.

Table 2.1 ▪ Psychoanalytic Theories of Development

Approximate Age	Freud's Psychosexual Theory		Erikson's Psychosocial Theory	
0 to 18 months	Oral	Basic drives focus on the mouth, tongue, and gums. Feeding and weaning influence personality development. Freud believed that failure to meet oral needs influences adult habits centering on the mouth, such as fingernail biting, overeating, smoking, and excessive drinking.	Trust vs. mistrust	Infants learn to trust that others will fulfill their basic needs (nourishment, warmth, comfort), or they learn to lack confidence that their needs will be met.
18 months to 3 years	Anal	Basic drives are oriented toward the anus, and toilet training is an important influence on personality development. If caregivers are too demanding, pushing the child before they are ready, or too lax, children may develop control issues such as a need to impose extreme order and cleanliness on their environment or extreme messiness and disorder.	Autonomy vs. shame and doubt	Toddlers learn to be self-sufficient and independent through toilet training, feeding, walking, talking, and exploring, or they learn to lack confidence in their abilities and doubt themselves.
3 to 6 years	Phallic	In Freud's most controversial stage, basic drives shift to the genitals. The child develops a romantic desire for the other-sex parent and a sense of hostility and fear of the same-sex parent. The conflict between the child's desires and fears arouses anxiety and discomfort. It is resolved by pushing the desires into the unconscious and spending time with the same-sex parent and adopting their behaviors and roles, adopting societal expectations and values. Failure to resolve this conflict may result in guilt or a lack of conscience.	Initiative vs. guilt	Young children become curious, ambitious, and eager for responsibility, or they experience overwhelming guilt for their curiosity and for overstepping boundaries.
6 years to puberty	Latency	This is not a stage but a calm time between stages when the child develops talents and skills and focuses on school, sports, and friendships.	Industry vs. inferiority	Children learn to be hardworking, competent, and productive by mastering new skills at school, in their friendships, and in their home life, or they may experience difficulty, leading to feelings of inadequacy and incompetence.
Adolescence	Genital	With the physical changes of early adolescence, the basic drives again become oriented toward the genitals. The person becomes concerned with developing mature adult sexual interests and sexual satisfaction in adult relationships throughout life.	Identity vs. role confusion	Adolescents search for a sense of self by experimenting with roles, looking for answers to the question *Who am I?* regarding their career, sexual, and political roles. However, they may remain confused about who they are and their place in the world.

(*Continued*)

Table 2.1 ▪ Psychoanalytic Theories of Development (*Continued*)

Approximate Age	Freud's Psychosexual Theory		Erikson's Psychosocial Theory	
Early adulthood			Intimacy vs. isolation	Young adults seek companionship and a close relationship with another person or experience, or they seek isolation and self-absorption because they have difficulty developing intimate relationships and sharing with others.
Middle adulthood			Generativity vs. stagnation	Adults contribute to, establish, and guide the next generation through work, creative activities, and parenting, or they stagnate, remaining emotionally impoverished and concerned about themselves.
Late adulthood			Integrity vs. despair	Older adults look back at life to make sense of it, accept their mistakes, and view life as meaningful and productive, or they feel despair over the goals they never reached and fear death.

Behaviorist Theories

In contrast with psychoanalytic theory's emphasis on the unconscious, which cannot be observed or falsified by research, scientists who study **behaviorism** examine only observable behavior. Thoughts and emotions cannot be seen or objectively verified; therefore, behaviorists believe they cannot be studied. Behaviorist theories emphasize the role of the environment in controlling behavior. Consider this famous quote from John Watson (1925), a founder of behaviorism:

> Give me a dozen healthy infants, well formed, and my own specified world to bring them up in and I'll guarantee to take any one at random and train him to become any type of specialist I might select—doctor, lawyer, artist, merchant, chief, and yes, even beggar-man and thief, regardless of his talents, penchants, tendencies, abilities, vocations, and race of his ancestors. (p. 82)

Watson believed he could control a child's destiny by controlling an infant's physical and social environment. Behaviorist theory is also known as *learning theory* because it emphasizes how people and animals learn new behaviors and develop through environmental shaping. Classical and operant conditioning are two learning theories.

Pavlov's Classical Conditioning

Classical conditioning is a type of learning in which a person or animal forms associations between environmental stimuli and physiological and emotional responses. The Russian physiologist Ivan Pavlov (1849–1936) discovered classical conditioning when he observed that dogs salivate not only when they taste food but also in response to specific sights and sounds they encounter before eating, like the clattering of their food bowl or their owner opening the food cupboard. To test his observation, Pavlov paired the sound of a tone with the dog's food; the dogs heard the tone and then received food. Soon, the tone alone started to trigger the dogs' salivation.

In classical conditioning, a neutral stimulus, such as the tone in Pavlov's experiment, begins to elicit a response produced initially by another stimulus, in this case, the food. Many fears and other emotional associations are the result of classical conditioning. For example, if an adolescent experiences

food poisoning after eating shellfish, they might feel nauseated at the smell of shellfish because they now associate it with the unpleasant experience. Conversely, an adolescent might feel excitement when they hear a text message notification because they associate it with receiving a message from a friend or crush. Classical conditioning applies only to involuntary physiological and emotional responses, yet it is a cornerstone of psychological theory. Although it does not explicitly address adolescents, classical conditioning can account for some adolescent behavior. A second behaviorist theory, operant conditioning, accounts for voluntary responses.

Skinner's Operant Conditioning

Perhaps it is human nature to notice that the consequences of our behavior influence our future behavior. A teenager who arrives home after curfew and is greeted with a severe scolding may be less likely to return home late in the future. A teacher who distributes cupcakes to students in an early-morning class and notices that students arrive on time and in good spirits may be more likely to bring cupcakes in the future. These two examples illustrate the basic tenet of B. F. Skinner's (1905–1990) theory of **operant conditioning**, which holds that behavior becomes more or less probable depending on its consequences. According to Skinner, a behavior followed by a rewarding or pleasant outcome, called **reinforcement**, will be more likely to recur, but one followed by an aversive or unpleasant outcome, called **punishment**, will be less likely to recur.

All people and animals—even insects—can learn through operant conditioning. It can explain much about human behavior, including how people learn skills and habits. Behaviorist ideas about operant conditioning are woven into the fabric of North American culture and are often applied to understanding parenting and parent-child interactions (Troutman, 2015). Although reinforcement and punishment can explain and influence adolescent behavior, operant conditioning does not offer a theory of adolescent development itself. Moreover, developmental scientists tend to disagree with operant conditioning's emphasis on external events (reinforcing and punishing consequences) over internal events (thoughts and emotions) as influences on behavior (W. C. Crain, 2016). That is, controlling an adolescent's environment can influence their development, but an adolescent can devise new ideas and learn independently without reinforcement or punishment.

Review

1. Describe similarities and differences between Freud's and Erikson's theories.
2. How do classical conditioning and operant conditioning differ?

Thinking in Context

1. Suppose you wanted to change your messy roommate's behavior so that they keep their area clean. Would you choose classical or operant conditioning? How would you apply the theory to change their behavior?
2. Consider your development: What are your greatest concerns? What are you working on? Which psychoanalytic theory best describes your experience and concerns at this time? Why?

Apply

Fourteen-year-old Marcus has always been shy. Lately he's started spending more time hanging out with his friends in the neighborhood. He's developed an attraction to a classmate, Jessica, that feels intense and confusing. Whenever he sees her, his heart races and his hands get sweaty. He can't stop thinking about her. He wonders what kinds of guys she likes and whether she likes him. This is hard because Marcus feels like he doesn't really know himself well. Does he want to play more sports? After scoring a goal in gym class and hearing the other kids cheer, Marcus decided to play soccer in gym and try out for the team. He wonders if he should try other sports and hang out with the athletes at school. Marcus likes to draw; should he hang out with the artsy kids? Maybe he should focus

more on school and spend time with the smart kids. And what does this all mean for his future after high school?

1. Consider Marcus's experience from the perspective of psychoanalytic and behaviorist theories. How might Freud explain his behavior? Erikson? Pavlov? Skinner?
2. Which theory, or what combination of theories, do you think accounts for Marcus's development and behavior?

Cognitive Theories

2.3 Compare cognitive-developmental, information processing, sociocultural, and social cognitive theories.

Cognitive theorists view cognition—thought—as essential to understanding people's functioning throughout life. Developmental scientists agree thinking changes with development, but they offer varying explanations for these differences. Some view cognition as developing in spurts, and others view it as gradual increases in abilities.

Piaget's Cognitive-Developmental Theory

Swiss scholar Jean Piaget (1896–1980) was the first to systematically examine infants' and children's thinking. He believed that cognition is at the center of development because it influences all behavior. According to Piaget's **cognitive-developmental theory**, children actively explore their world. They are driven to learn by interacting with the world around them, organizing what they learn into **cognitive schemas**, or concepts, ideas, and ways of interacting with the world. They construct and refine their cognitive schemas through these interactions, contributing to their cognitive development.

Think of a cognitive schema as a concept, a belief, or something known. We build our concepts or beliefs by engaging with people and things in our environment. We talk to people and touch objects—and our knowledge, our set of cognitive schemas, grows. We rely on our schemas to make sense of the world. They are constantly adapting and developing in response to our experiences. Piaget emphasized the importance of two developmental processes that enable us to adapt to our world cognitively: assimilation and accommodation.

Assimilation and Accommodation

Frequently, we encounter information that is similar to something we already know. We can apply existing learning strategies to learn that information. **Assimilation** involves integrating a new experience into a preexisting cognitive schema.

Suppose a child has a cognitive schema for a dog based on their own large dog, who has big ears and a long tail. The child encounters a Labrador retriever and says, "Dog!" Then they see a German shepherd and say, "Dog!" Finally, they see a mixed-breed dog and say, "Dog!" The child understands that each of these creatures fits their schema or concept of the characteristics that constitute a dog. The child develops an understanding of the new creatures through assimilation by fitting them into their preexisting schema of a dog.

Sometimes, we encounter experiences or information that does not fit within an existing schema, so we must adapt and modify the schema in light of the new information. This process is called **accommodation**. Suppose the child encounters a tiny creature with small ears and a short tail. When told that the creature is a dog, the child must change their schema of *dog* or create a new one to incorporate the new information—that dogs can be small. We change our cognitive schemas, ways of thinking, and knowledge through accommodation.

As you read these words, perhaps your knowledge about development (a cognitive schema) has changed after reading these new ideas (accommodation). Maybe you were already familiar with these ideas and instead incorporated this information into your existing framework (assimilation). The processes of assimilation and accommodation enable people to adapt to their environment, absorbing the constant influx of information they encounter daily.

Equilibration

We constantly encounter new information. Some of the information is assimilated into cognitive schemas. Some schemas are accommodated to accept the new information. Piaget proposed that people are driven to find equilibrium, or a balance between assimilation and accommodation, a process he called **cognitive equilibration**. When assimilation and accommodation are balanced, people neither incorporate new information into their schemas nor change their schemas in light of new information. They do not need to, because their schemas match the outside world and represent it clearly. However, a state of cognitive equilibrium is rare and fleeting. People frequently experience a mismatch, or cognitive disequilibrium, between their schemas and the world.

Disequilibrium leads to cognitive growth, because the mismatch between schemas and reality leads to confusion and discomfort. It motivates individuals to modify their cognitive schemas so that their view of the world matches reality. This modification occurs through cognitive equilibration and the coordination of assimilation and accommodation to restore balance. Piaget proposed that children's drive for equilibration and to construct more sophisticated cognitive schemas that match reality propels them through four stages of cognitive development, from infancy through adolescence, as shown in Table 2.2. These stages represent four progressively more sophisticated forms of reasoning: sensorimotor, preoperational, concrete operational, and formal operational reasoning.

Table 2.2 ▪ Piaget's Stages of Cognitive Development

Stage	Approximate Age	Description
Sensorimotor	Birth to 2 years	Infants understand the world and think using only their senses and motor skills, by watching, listening, touching, and tasting.
Preoperations	2 to 6 years	Preschoolers explore the world using their own thoughts as guides and develop the language skills to communicate their thoughts to others. Despite these advances, their thinking is characterized by several errors in logic.
Concrete Operations	7 to 11 years	School-aged children become able to solve everyday logical problems. Their thinking is not yet fully mature, because they can apply it only to tangible problems and tied it to specific substances.
Formal Operations	12 years to adulthood	Adolescents and adults can reason logically and abstractly about possibilities, imagined instances and events, and hypothetical concepts.

In adolescence we reach the pinnacle of development—**formal operational reasoning**, or abstract thought. Adolescents become capable of logical reasoning. They can devise hypotheses about real and imagined phenomena and apply the scientific method to solve problems. Now they can understand that a statement can be interpreted in more than one way—for example, that a comment such as "great" can be interpreted positively and also as a sarcastic retort. The ability to consider multiple perspectives influences adolescents' relationships because they can imagine and act on other people's feelings. We will consider Piaget's ideas about adolescent development in Chapter 4.

Piaget's cognitive-developmental theory transformed the field of developmental psychology and remains one of the most widely cited developmental theories. It was the first to consider *how* children and adolescents think and to view people as active contributors to their development. In addition, Piaget's concept of cognitive stages and the suggestion that individuals' reasoning is limited by their stage has implications for education—specifically, the idea that effective instruction must match children and adolescents' developmental level.

Critics of cognitive-developmental theory argue that Piaget focused too heavily on cognition and ignored emotional and social factors in development (W. C. Crain, 2016). Others believe that Piaget neglected the influence of contextual factors by assuming that cognitive-developmental stages are universal—that all individuals everywhere progress through the stages in a sequence that does not vary. Other theorists, like Vygotsky, emphasize the role of context in cognitive development.

Vygotsky's Sociocultural Theory

We are immersed in a culture that influences how we think and approach the world. Russian scholar Lev Vygotsky (1896–1934) emphasized the importance of culture in development. Recall that culture refers to the beliefs, values, customs, and skills of a group; it is a product of people's interactions in everyday settings (Markus & Hamedani, 2020). Vygotsky's (Vygotsky, 1978) **sociocultural theory** examines how culture is transmitted from one generation to the next through social interaction.

Lev Vygotsky (1896–1934) emphasized the importance of culture and social interaction in development.

SPUTNIK/Alamy Stock Photo

This process begins in infancy but continues throughout childhood, adolescence, and beyond. Children and adolescents interact with adults and more experienced peers as they talk, play, and work alongside them. Through these formal and informal social contacts, individuals learn about their culture and what it means to belong to it and acquire cultural tools, including a culture's language, which transmits ways of thinking (Daniels, 2017). Children and adolescents adopt their culture's perspectives and practices by participating in cooperative dialogues and receiving guidance from adults and more expert peers, learning to think and behave as group members (Rogoff, 2016). Over time, they can apply these ways of thinking to guide their actions, thus requiring less assistance from adults and peers (Rogoff et al., 2014).

Like Piaget, Vygotsky emphasized that children and adolescents actively participate in their development by engaging with the world around them. However, Vygotsky also viewed development as a social process that relies on interactions with adults, more mature peers, and other members of one's culture. Vygotsky's sociocultural theory is an important addition to the field of human development because it is the first theory to emphasize the role of the cultural context in influencing people's development throughout life. While Vygotsky did not explicitly discuss adolescent development, his theory applies to adolescence. Critics of sociocultural theory argue that it overemphasizes the role of context, minimizes the role of individuals in their own development, and undervalues the influence of genetic and biological factors (Crain, 2016). Some cognitive theorists focus on the process of thinking itself, positing that cognitive development is a continuous process of growth and skill development (Birney & Sternberg, 2011), as described in the following section.

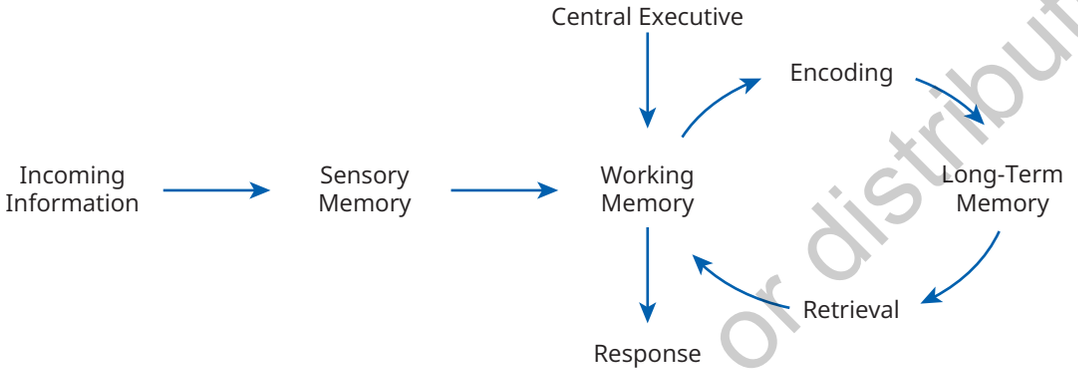
Information Processing Theory

A popular way of considering cognition emphasizes that the mind works similarly to a computer in that information enters and then is manipulated, stored, recalled, and used to solve problems. Unlike the theories we have discussed so far, information processing theory isn't attributed to a single theorist but is made up of numerous theories, each emphasizing a different aspect of thinking (Conte & Richards,

2021; Eggen, 2020; Winne, 2021). Some theories focus on how people perceive, attend to, and absorb information. Others examine how people store information, create memories, and remember information. Still others examine problem-solving skills, such as how people approach and solve problems in school, the workplace, and everyday life.

Even the casual observer will notice that adolescents are better at processing information than children. The information processing perspective poses that, throughout the lifespan, we manipulate information through a cognitive system comprising three mental stores: sensory register, working memory, and long-term memory (Klahr & Wallace, 2022). Figure 2.2 illustrates the information processing system. From childhood into adolescence, we become more proficient at using these stores.

Figure 2.2 ▪ Information Processing System



The **sensory register**, sometimes called *sensory memory*, filters incoming sensory information. It holds incoming sensory information in its original form. For example, look at this page, then close your eyes. Did you "see" the page for a fraction of a second after you closed your eyes? That image, or icon, represents your sensory register. If not processed, information fades from sensory memory rapidly—sometimes in fractions of a second. We take in much more sensory information than we process. Instead, much is discarded. But when we direct our **attention** or awareness to information, it passes to the next part of the information processing system, working memory.

Working memory comprises a short-term store (sometimes called short-term memory) for holding information, a working space where information is processed or "worked on" by manipulating (considering), encoding (creating a memory), or retrieving (recalling), and the **central executive**, a control processor that regulates cognitive activities. Working memory is responsible for maintaining and processing information used in complex cognitive tasks (Gathercole, 1998). All of your thoughts—that is, all conscious mental activity—occur within working memory. For example, reading this paragraph, remembering what you have learned about memory in prior classes, and considering how this material applies to your own experience taps your working memory. Just as your thoughts constantly change, so do the contents of working memory.

A core assumption of the information processing approach is the idea of limited capacity. We can hold on to only so much information in our minds or working memory for only so long. With development, we get better at retaining information in working memory and using it more efficiently. The central executive directs the flow of information throughout the cognitive system (Baddeley, 2016). The central executive determines what is important to attend to (and when to stop attending to stimuli), combines new information with information already in working memory, and selects and applies strategies for manipulating the information to understand it, make decisions, and solve problems (Baddeley, 2012). Collectively, these cognitive activities are known as **executive function**.

As information is manipulated in working memory, it becomes more likely to enter long-term memory, the third mental store. **Long-term memory** is an unlimited store that holds information indefinitely. Information is not manipulated or processed in long-term memory; it is simply stored until it is retrieved to manipulate in working memory (e.g., by remembering events and thinking about

them). In adolescence, we amass a great deal of information, organize it in increasingly sophisticated ways, and encode and retrieve it more efficiently and with less effort.

According to information processing theorists, our mental processes of noticing, taking in, manipulating, storing, and retrieving information do not show the radical changes associated with stage theories. Instead, we are born with these abilities, and development largely entails changes in the efficiency and speed with which we think (Luna et al., 2015). Information processing theory examines cognition throughout the lifespan, not simply in adolescence, because cognition changes throughout life occur alongside changes in brain functioning, experience, and social interactions. Information processing abilities mature over adolescence, enabling young people to consider and solve complex problems in their everyday world. Neurological development plays a critical role in developing information processing abilities in adolescence.

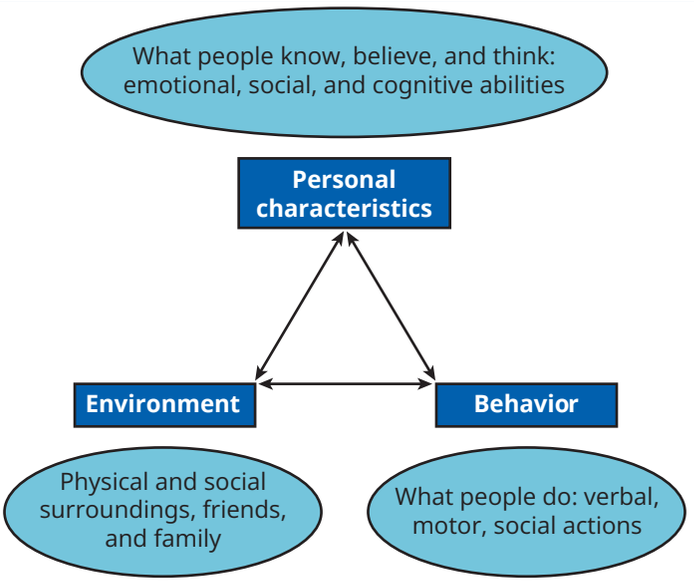
Information processing theory offers a detailed explanation of thinking, allowing scientists to make and test specific predictions about behavior and performance. Indeed, information processing theory has generated many research studies and garnered much empirical support (Halford & Andrews, 2011; Wickens & Carswell, 2021). Although information processing theory does not explicitly refer to adolescence, the developmental processes apply to this period of life. Critics of the information processing perspective argue that a computer model cannot capture the complexity of the human mind and people's unique cognitive abilities. In addition, findings from laboratory research may not extend to everyday contexts in which adolescents must adapt to changing circumstances and challenges to attention (Miller, 2016).

Social Cognitive Theory

Like behaviorist theorists, Albert Bandura (1925–2021) viewed the environment as a vital influence on behavior. Bandura also argued that thoughts and emotions contribute to behavior and development. People actively process information—they think and feel emotion—and their thoughts and feelings influence their behavior. For example, adolescents who are tempted to break curfew might anticipate their parents' worry and decide to return home on time. Moreover, individuals are active in their development; they are not passively molded by their physical and social environments.

Bandura's **social cognitive theory** explains development as the result of interactions among individuals' physical and social environment, their cognition and their personal characteristics, and their behavior, a concept he called **reciprocal determinism** (Bandura, 2011, 2018) (Figure 2.3). Essentially, individuals and the environment interact and influence each other over time (Bandura, 2011, 2018).

Figure 2.3 ▪ Bandura's Model of Reciprocal Determinism



Bandura argues that individuals' thoughts and characteristics determine their behavior and the environments they seek. Adolescents who are athletically inclined (cognitive/personal characteristic) tend to play sports (behavior) and seek out environments that support their interests, such as athletic teams. Environments (athletic teams), in turn, influence adolescents' thoughts and personal characteristics (interest in athletics) and behaviors (playing sports). The complex interplay among person, behavior, and physical and social environment underlies much of what we will discuss throughout this book.

One of Bandura's most enduring ideas about development is that people learn by observing and imitating others, which he referred to as **observational learning** (Bandura, 2012). We do not need to experience punishment or reinforcement to change our behavior. We can learn by observing others and the consequences of their behavior and thinking about the potential consequences of our actions. Our observations influence our beliefs about a given behavior, influencing our future behavior. Observational learning is one of the most powerful ways of learning. Although Bandura did not theorize specifically about adolescent development, his ideas about observational learning and especially the concepts of reciprocal determinism have implications for understanding adolescent development.

Review

1. What is a cognitive schema? How do assimilation and accommodation influence cognitive schemas?
2. How do adolescents reason, according to Piaget?
3. Why is culture important, according to Vygotsky?
4. From an information processing perspective, what are the components of our cognitive system?
5. What is social learning, and how does it affect behavior?

Thinking in Context

1. A common criticism of cognitive theories is that they only look at the mind, ignoring the environment as well as other types of development, such as physical and socioemotional. Do you believe this is true? Examine each theory: Is there a role for the environment? Are other types of development addressed? Consider:
   a. Piaget's cognitive developmental theory
   b. Vygotsky's sociocultural theory
   c. Information processing theory
   d. Social learning theory
2. Which theory, in your view, best accounts for the individual, the environment, and other aspects of development? Why?

Apply

Fifteen-year-old Alexi has always been curious about how things work. Recently, he became interested in politics and philosophy. In his social studies class, he's learning about different forms of government. At first, he struggles to understand how systems like democracy and authoritarianism are so different. Heated discussions with his friends, sharing perspectives and challenging each other, have helped him refine his ideas and grasp the complexity of these ideas. Outside of class, Alexi notices that his older brother, who is actively involved in student government, often speaks passionately about civic responsibility and leadership. Alexi pays close attention to his brother's confident speeches, remembering and drawing from them when thinking about leadership. Inspired by his brother's behavior, Alexi decides to run for class representative.

1. How does Alexi illustrate adolescent cognitive development in Piaget's cognitive developmental theory?
2. What is the role of social interaction in Alexi's changing views? How might Vygotsky explain Alexi's development?
3. What information processing changes, such as in attention, memory, and executive function, contribute to Alexi's understanding of political systems and ability to share his views?
4. What role does Alexi's brother play in his political interests? How might Bandura account for Alexi's development and behavior?

Systems Theories

2.4 Discuss bioecological systems theory and dynamic systems theory.

Many theories examine a specific aspect of development, such as cognition, the sense of self, or environmental determinants of behavior. Systems theories take a broader approach, considering all parts of the individual and the many contexts in which they are embedded—home, school, peer group, and so forth (de Ruiter et al., 2019). A system is a set of interconnected interacting parts that work together as a network. We are composed of multiple interacting systems that constitute the physical, cognitive, and socioemotional developments we discussed. We are also embedded in systems or contexts. People take an active role in their development by interacting with people, objects, and settings—and these factors also influence them. These interactions take place throughout our lives, changing over time. The two predominant systems theories are the bioecological systems theory and dynamic systems theory.

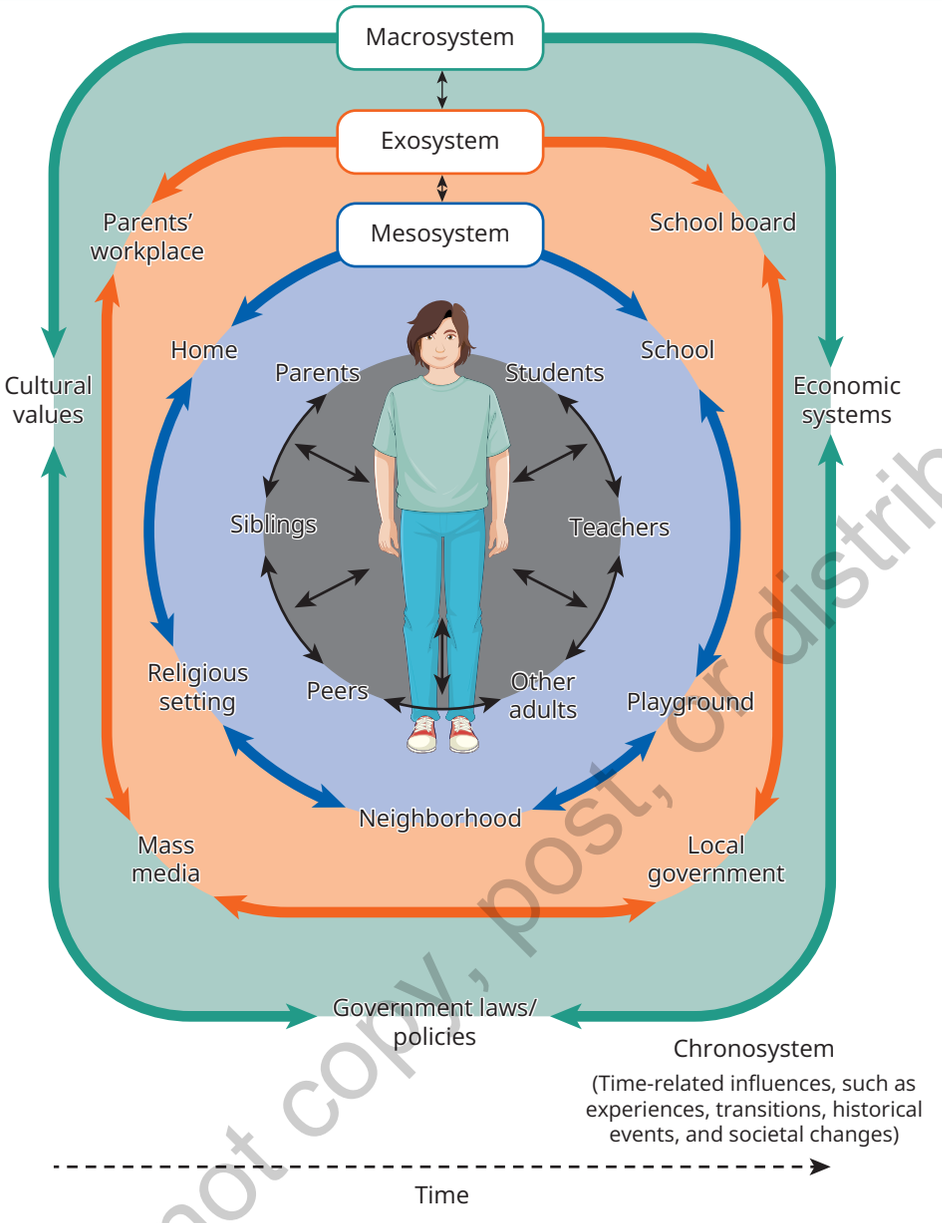
Bioecological Systems Theory

Like other developmental theorists, Urie Bronfenbrenner (1917–2005) believed that children influence their development. He also emphasized the importance of context in development. Bronfenbrenner proposed that all individuals are embedded in, or surrounded by, a series of contexts: home, school, neighborhood, culture, and society. As shown in Figure 2.4, contexts are organized into a series of systems in which individuals are embedded and interact with one another and the person to influence development. Bronfenbrenner's **bioecological systems theory** explains development as the result of the ongoing interactions among biological, cognitive, and psychological changes in children and their changing context (Bronfenbrenner & Morris, 2006). The bioecological systems theory thus offers a comprehensive perspective on the role of context in influencing development.

At the center of the bioecological system is the individual. **Ontogenetic development** refers to the changes that take place in the individual, the center of the bioecological model. Ontogenetic development comprises the developing adolescent's interacting biological, cognitive, and socioemotional traits. Genetic, psychological, emotional, and personality traits interact, for example, influencing each other. Physical development, such as brain maturation, may influence cognitive development, such as the ability to consider other people's perspectives. These changes might influence social development, specifically the ability to have more complex and intimate friendships, which can influence cognitive development as adolescents learn from each other. In this way, the various forms of development interact. Ontogenetic development is influenced by, but also influences, the many contexts in which we are embedded (Bronfenbrenner & Morris, 2006).

Perhaps the most visible context is the **microsystem**, the innermost level of the bioecological system. It includes interactions with the immediate physical and social environment surrounding

Figure 2.4 ▪ Bronfenbrenner's Bioecological Systems Theory



Source: Adapted from Bronfenbrenner & Morris, 2006.

the person, such as family, peers, and school. Because the microsystem contains the developing adolescent, it has an immediate and direct influence on their development—and they affect it. Interactions with friends, family, and teachers (all part of the microsystem) can influence (and are influenced by) adolescents' sense of self-esteem, social skills, and emotional development (ontogenetic development).

Microsystem factors naturally interact. Experiences in the home (one microsystem factor) influence those at school (another microsystem factor). Encouragement and support for reading at home, for instance, can influence the child's experiences in the classroom. These interactions comprise the **mesosystem**, which refers to the relations among microsystems and connections among contexts, such as home, peer group, school, work, and neighborhood. Like the microsystem, the mesosystem directly influences children (and is influenced by children) because they participate in it.

The **exosystem** consists of settings in which the individual is not a participant but that nevertheless influence them. For example, the availability of funding for schools indirectly affects adolescents by influencing the availability of classroom resources. Funding for after-school community centers, exposure to public service announcements (such as anti-drug messages), and the availability of part-time employment are all exosystem factors that influence adolescents. The exosystem is an important contribution to our understanding of development because it shows us how the effects of outside factors trickle down and indirectly affect individuals.

The **macrosystem** is the greater sociocultural context in which the microsystem, mesosystem, and exosystem are embedded. It includes cultural values, legal and political practices, and other elements of the society at large. The macrosystem indirectly influences the adolescent because it affects each of the different contextual levels. For example, cultural beliefs about the value of education (macrosystem) influence funding decisions made at national and local levels (exosystem) as well as what happens in the classroom and the home (mesosystem and microsystem).

By its very nature, the bioecological model is constantly shifting because individuals and their contexts interact dynamically and perpetually, resulting in a constant state of change. The final element of the bioecological system is the **chronosystem**, which refers to the element of time. As discussed in Chapter 1, the sociohistorical time in which we live influences their development. Large-scale social changes, such as those accompanying war, natural disasters, and epidemics, can affect each level of the bioecological system. For example, neighborhood resources may change over time with changes in local policies and funding. Adolescents' relationships with parents, friends, and teachers change over time—and their microsystems and mesosystems change dynamically.

The bioecological model has been criticized for its vague explanation of development, especially the role of culture (Vélez-Agosto et al., 2017). Situated in the macrosystem, culture is said to influence development through the interdependence of the systems. Today's developmental scientists believe that culture is not just a macrosystem factor. Culture refers to *all* the processes people use as they make meaning or think through interactions with group members (Mistry et al., 2016; Varnum & Grossmann, 2017). Critics argue that since culture is manifested in our daily interactions and activities, it is inherent in each bioecological level, not just the macrosystem as Bronfenbrenner believed (Vélez-Agosto et al., 2017).

A second criticism arises from the sheer complexity of the bioecological model and its attention to patterns and dynamic interactions. We can never measure and account for all the potential individual and contextual influences on development at once, making it challenging to devise research studies to test the model's validity. Proponents, however, argue that rather than conducting large studies to test all the model's components simultaneously, smaller studies can examine each element over time (Jaeger, 2016; Tudge et al., 2016, 2022). Bronfenbrenner's bioecological theory examines development throughout the lifespan, including adolescence. Its attention to the interactions among adolescents and their contexts provides valuable insights into the role of context in development and individual differences in development.

Dynamic Systems Theory

A more recent theory, devised in the 1990s, is **dynamic systems theory**, proposed by Esther Thelen (1941–2004). Like others we have discussed, this theory examines the interaction between biological and environmental factors in development (see Figure 2.5). However, dynamic systems theory highlights the individual's active role in shaping their developmental path through interactions with their surroundings.

Dynamic systems theory emphasizes the dynamic interplay among individuals' maturation, contextual circumstances, supports (factors that promote development), and constraints (factors that can hinder development), along with their unique goals (Thelen, 1995, 2000). These elements collectively form an integrated system with constantly changing interactions that drive developmental change and the emergence of new abilities.

Originally developed to describe infants' motor skills, the theory has been extended to account for other aspects of development across different ages, including adolescence (Adolph, 2020; Perone et al.,

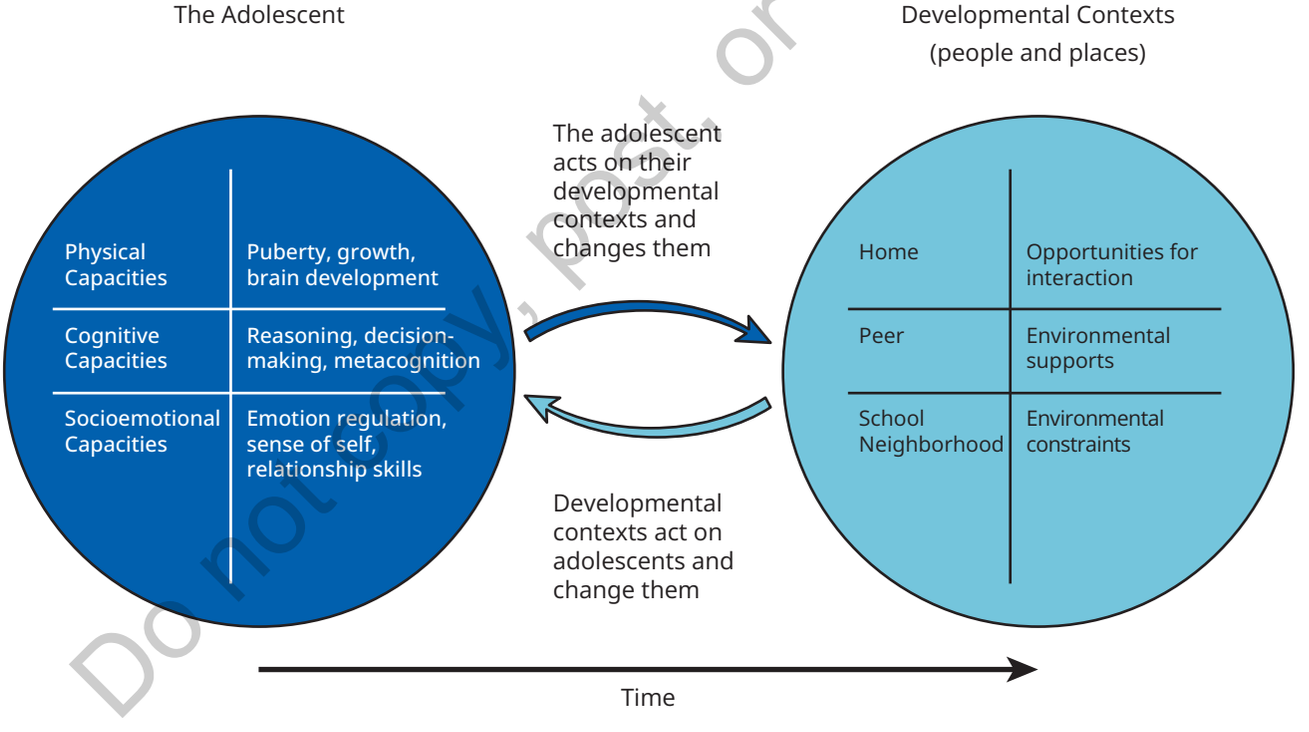
2021; Sosnowska et al., 2020). Dynamic systems theory places individuals at the center of their development. Each person is unique, with specific goals and environmental circumstances that offer distinct opportunities and constraints for development. Individuals are driven to achieve their goals, and the extent to which they succeed depends on their maturation and their interactions with the opportunities, supports, and constraints in their environment.

Physical, cognitive, or socioemotional development does not occur in isolation but is influenced by the social and cultural contexts in which it unfolds. Adolescents are motivated to master their world by capitalizing on opportunities and adapting to constraints to achieve personal and developmental goals, such as establishing close friendships, developing a sense of self, and improving their capacity for intimacy. Adolescents' goals shift as their abilities grow and they gain experience, prompting behaviors that further their development. Through this feedback loop, development involves integrating and refining various skills and abilities in response to their environments, enabling adolescents to navigate their social environments more effectively.

Just as this infant is motivated to reach a goal, these toys, adolescents are driven to explore their world.

iStockPhoto.com/FatCamera

Figure 2.5 ▪ Dynamic Systems Theory



Source: Benson & Scales, 2009.

Dynamic systems theory offers a complex view of human development over time. The complex perspective it provides is also a challenge because, like bioecological theory, it is not possible to measure and account for all of the interacting influences on development (Miller, 2022). The various theories we have discussed provide a range of explanations for development. Table 2.3 compares the theories on the core issues of development—namely, the degree to which each views (1) development as influenced by nature and nurture; (2) development as characterized by abrupt or gradual change; (3) individuals as active in their development; and (4) development as taking one or many paths—as well as the extent to which the theory examines adolescent development specifically.

Table 2.3 ▪ Comparing Developmental Theories

Theory	Role of biology and environment in development	Do individuals influence their own development?	Is developmental change gradual or abrupt?	Is there one developmental path or many?	Adolescent development
Freud's psychosexual theory	Greater emphasis on biology: People are driven by inborn drives, but the extent to which the drives are satisfied influences developmental outcomes	Individuals are passively driven by inborn instincts and are not active participants in their own development	Abrupt stages	One path: All people progress through the psychosexual stages	Adolescents are in the genital stage of development
Erikson's psychosocial theory	Both biology and environment: Biological and social forces propel children through the stages, and social and psychosocial influences determine the outcome of each stage	Individuals actively interact with their social world to resolve psychosocial tasks	Abrupt stages	One path: All people progress through the psychosocial stages; their expression can vary with context and culture	Adolescents are in the identity vs identity confusion stage of development
Behaviorist theory	Environment: Environmental influences shape behavior	Individuals are passively shaped and molded by their environment	Gradual process of learning new behaviors	Many paths: Although learning processes are universal, the content learned varies with context	Learning processes occur at all ages; no explicit statement about adolescence
Bandura's social learning theory	Both biology and environment: Inborn characteristics and the physical and social environment influence behavior	Individuals are actively influenced by the environment but also play an active role in their development through reciprocal determinism	Gradual process of learning new behaviors	Many paths: Context-specific reciprocal interactions influence development	Processes occur at all ages; no explicit statement about adolescence
Piaget's cognitive-developmental theory	Both biology and environment: An inborn ability to learn coupled with brain development leads children to interact with the world; opportunities provided by the physical and social environment influence development	Individuals actively interact with the world to create their own schemes	Abrupt stages	One path: All people progress through the cognitive-developmental stages	Adolescents are in the formal operations stage

Information processing theory	Both biology and environment: Children are born with processing capacities that develop through maturation and environmental influences	Individuals actively attend to, process, and store information	Gradual increase in skills and capacities	One path: All people show advances in cognitive abilities	Processes occur at all ages; no explicit statement about adolescence
Vygotsky's sociocultural theory	Both biology and environment: Children learn through interactions with more skilled members of their culture; capacities are influenced by genes, brain development, and maturation	Children actively interact with members of their culture	Gradual increase in skills and capacities	Many paths: Interactions with context and culture influence development	Processes occur at all ages; no explicit statement about adolescence
Bronfenbrenner's bioecological systems theory	Both biology and environment: Children's inborn and biological characteristics interact with an ever-changing context to influence behavior	Children actively interact with their contexts, being influenced by their contexts but also determining what kinds of physical and social environments are created and how they change	Gradual increase in skills and capacities	Many paths: Interactions with context and culture influence development	Processes occur at all ages; no explicit statement about adolescence
Dynamic systems theory	Both biology and environment: Developmental domains, maturation, and environment form an integrated system	Children actively influence their development by goal-driven behavior	Gradual increase in skills and capacities	Many paths depending on individuals' goals and contexts	Processes occur at all ages; no explicit statement about adolescence

Review

1. Define the six systems comprising Bronfenbrenner's bioecological model.
2. What are the three main components of dynamic systems theory?

Thinking in Context

1. Apply Bronfenbrenner's bioecological model to your context.
   a. Describe your microsystem and mesosystem. Identify at least three examples of each.
   b. List examples of your exosystem. What are some ways in which your exosystem has influenced your development?
   c. Finally, identify at least two examples that illustrate the effect of the macrosystem on your development.
2. Considering dynamic systems theory, how have you influenced your development? Consider your actions, goals, and experiences. What circumstances, environmental supports, and constraints have played a role in your development?

Apply

Sixteen-year-old Jamila recently moved to a new city because of her mother's new job. She's found it hard to adjust to a new school and neighborhood and leave behind her old friends. At her previous school, Jamila was a top student, participated in the debate team, and had a tight-knit group of friends. Now she struggles to fit in in her new school, feels overwhelmed by her new classes and new teachers, and has not gotten involved in extracurricular activities. Her parents have been busy adjusting themselves and haven't had much time to talk like they used to. Her mother works long hours at her new job, and her father deals with stress from trying to find a job in their new city. Jamila's younger brother, on the other hand, has adapted quickly, joining the soccer team and making friends right away. Despite her struggles, Jamila's former debate friends have kept in touch, encouraging her to join the debate club in her new school. Over time, Jamila joins the new debate club and slowly starts making friends, but her academic performance and self-confidence are still hampered by the move, making it hard to adapt.

1. Consider Jamila's microsystem and mesosystem. How might Jamala's relationships with parents, peers, school, and former debate friends influence her adjustment?
2. Discuss exosystem factors that might affect Jamila's adjustment.
3. What are some environmental supports and restraints at school, at home, in the neighborhood, and within her social relationships that influence Jamila's adjustment?
4. How do Jamila's abilities and motivations interact with her circumstances and environmental supports and constraints to influence her adjustment?
5. Compare Jamila to her brother. Although they attend the same schools, have the same parents, and made the same move, why does their adaptation differ?

The Science of Adolescent Development

2.5 Describe methods and designs used to study adolescent development.

Developmental scientists create theories, such as those we have discussed, to organize their observations of adolescents' behavior in various settings and circumstances. Theories suggest new hypotheses to test in research studies. In turn, research findings are used to modify theories. Developmental scientists refine their theories about adolescent development by conducting multiple studies over time.

The Scientific Method

Developmental scientists employ the **scientific method**, a process of posing and answering questions by making careful and systematic observations, gathering and summarizing information, and drawing conclusions. It is an organized way of formulating questions, finding answers, and communicating research discoveries. Its basic steps are as follows:

1. Identify the research question or problem to be studied and formulate the hypothesis or proposed explanation to be tested.
2. Gather information to address the research question.
3. Summarize the information gathered and determine whether the hypothesis is refuted or shown to be false.
4. Interpret the summarized information, consider the findings in light of prior research studies, and share these findings with the scientific community and the world at large.

This four-step process seems straightforward and linear. In practice, it is often more complicated. Research studies frequently raise as many questions as they answer, and sometimes even more. Unexpected findings can lead to new studies. Researchers may replicate or repeat an experiment to confirm previous results. Sometimes, replications uncover flaws in data collection or research design, prompting a revised study. Experts may also disagree on the interpretation of a study, leading to new hypotheses and studies. In this way, scientific research is often a cyclical process.

Methods of Collecting Data

The basic challenge that developmental scientists face in conducting research is determining how to measure their topic of interest. What information is important? How can it be gathered? Scientists use the term *data* to refer to the information they collect. How can we gather data about adolescents? Should we simply talk with them? Watch them as they progress through their days? Hook them up to machines that measure physiological activity such as heart rate or brain waves? Developmental scientists use a variety of different methods, summarized in Table 2.4 and discussed next.

Table 2.4 ▪ Data Collection Methods

Measure	Advantage	Disadvantage
Observational Measures		
Naturalistic observation	Gathers data on everyday behavior in a natural environment as behaviors occur	The observer's presence may influence the children's behavior. No control over the observational environment
Structured observation	Observation in a controlled setting	May not reflect real-life reactions and behavior
Self-Report Measures		
Open-ended interview	Gathers a large amount of information quickly and inexpensively	Nonstandardized questions; characteristics of the interviewer may influence participant responses
Structured interview	Gathers a large amount of information quickly and inexpensively	Characteristics of the interviewer may influence children's responses
Questionnaire	Gathers data from a large sample more quickly and inexpensively than by interview methods	Some participants may respond in socially desirable or inaccurate ways

(*Continued*)

Table 2.4 ▪ Data Collection Methods (*Continued*)

Measure	Advantage	Disadvantage
	Physiological Measures	
Electroencephalography (EEG)	Measures electrical activity patterns produced by the brain	Does not provide information about the brain structures that are the source of brain activity
Computerized tomography (CT scan)	Provides images of brain structures, bone, brain vasculature, and tissue	Exposes participants to low levels of radiation
Positron emission tomography (PET)	Illustrates activity in specific parts of the brain as participants complete cognitive tasks	Exposes participants to low levels of radiation
Functional magnetic resonance imaging (fMRI)	Illustrates activity in specific parts of the brain as participants complete cognitive tasks; more detailed images than PET scans that do not rely on radiation	Expensive and requires participants to be completely still during the scan
Diffusion tensor imaging (DTI)	Measures the thickness and density of brain connections; less expensive than fMRI	Requires participants to be completely still during the scan

Observational Measures

Some developmental scientists collect data by watching and recording adolescents' behavior. Developmental scientists employ two types of observational measures: naturalistic observation and structured observation.

Naturalistic observation. Scientists who use **naturalistic observation** observe and record behavior in natural, real-world settings. For example, in one study, researchers examined peer interaction patterns over the transition to adolescence by observing 9- to-12- year-old children in the schoolyard during recess and lunch (Coplan et al., 2015). They recorded the early adolescents' activity and interaction with peers. They found that those who were consistently unengaged with peers tended to show high levels of problems, such as anxiety, depression, and loneliness, as reported by both the adolescents and their mothers.

Naturalistic observation can reveal behavior patterns in everyday settings, such as whether a particular event or behavior typically precedes another. Such observations can help researchers determine which behaviors are important to study. A scientist who studies bullying by observing children's play may notice that some victims act aggressively *before* a bullying encounter (Kamper-DeMarco & Ostrov, 2017). The scientist may then decide to examine aggression in victims not only after a bullying incident but also beforehand.

A challenge of using naturalistic observation is that sometimes the presence of an observer causes those being observed to behave unnaturally. This is known as *participant reactivity*. One way of reducing the effect of participant reactivity is to conduct multiple observations so that the participants get used to the observer and return to their normal behavior.

Another promising method of minimizing participant reactivity is to use an *electronically activated voice recorder* (EAR) (Carey et al., 2020; Mehl, 2017). Participants carry the EAR as they go about their daily lives. The EAR captures segments of audio information over time: hours, days, or even weeks. It yields a log of people's activities as they naturally unfold. The EAR minimizes participant reactivity because the participant is unaware of exactly when the EAR is recording. For example, in one study, adolescents with asthma carried the EAR For four days and reported on their experience of parent-adolescent conflict and asthma symptoms (Tobin et al., 2015). This study found that daily conflict (recorded by the EAR) predicted adolescents' self-reported asthma symptoms, suggesting that family relationships can influence health. Researchers use the EAR method to capture family interactions and study family processes, examining adolescents' immediate contexts (Mangelsdorf et al., 2020).

Naturalistic observation is a useful way of studying common events and behaviors. Some behaviors and events are difficult to observe or occur infrequently, however, requiring a researcher to observe for very long periods to obtain data on the behavior of interest. For this reason, many researchers make structured observations.

Structured observation. **Structured observation** involves observing and recording behaviors displayed in a controlled environment created by the experimenter. The laboratory environment permits researchers to exert more control over the situation than in natural settings, making it easier to observe specific behaviors. For example, pairs of adolescent friends completed a measure of depressive symptoms, then were observed discussing a problem in their lives (Spiekerman & Rose, 2024). The responses were coded as positive, negative, or neutral. Positive responses, such as offering support, sharing related experiences, and asking questions, were associated with fewer depressive symptoms nine months later, whereas negative responses, such as changing the subject, providing unsupportive comments, and minimizing the problem, were associated with a heightened risk for depressive symptoms nine months later.

Like naturalistic observation, a challenge of structured observation is identifying and categorizing which behaviors to record. However, the laboratory environment permits researchers to exert more control over the situation than natural settings do. In addition to cataloging observable behaviors, researchers can supplement their observations with technology to measure biological functions such as heart rate, brain waves, and blood pressure. One downside to structured observations is that people may behave differently in a laboratory than in real-life settings.

Self-Report Measures

Interviews and questionnaires are known as self-report measures, because participants, such as adolescents and parents under study, answer questions about their experiences, attitudes, opinions, beliefs, and behavior. Interviews are one-on-one conversations that can take place in person, over the phone, or via videoconferencing.

In an **open-ended interview**, a trained interviewer uses a conversational style that encourages adolescents to expand their responses. The scientist begins with a question and then follows up with prompts to better understand the adolescent's reasoning (McConaughy & Whitcomb, 2022). Interviewers may vary the order of questions, probe, and ask additional questions based on each child's responses. Consider this dialogue between a researcher and a high school student about the student's views of right and wrong:

> I: Can you ever say you know for sure about this issue?
>
> R: It . . . is very far along the continuum of what is probable.
>
> I: Can you say that one point of view is right and one is wrong?
>
> R: Right and wrong are not comfortable categories to assign to this kind of item. It's more or less likely or reasonable, more or less in keeping with what the facts seem to be [King & Kitchener, 1994, p 72].

In open-ended interviews, participants can explain their thoughts thoroughly and in their own words, but the flexibility of these interviews also poses challenges. When questions are phrased differently for each person, responses may not capture real differences in how adolescents think about a given topic. Instead, they may reflect differences in how the interviewer posed and followed up the questions.

In contrast, a **structured interview** poses the same set of questions in the same order to each child. Structured interviews are less flexible than open-ended interviews. All participants receive the same set of questions, so differences in responses are more likely to reflect actual differences among participants and not merely differences in the manner of interviewing. One study of adolescent cancer patients asked the following questions of all participants:

> Could you share with me your cancer diagnosis, type of cancer, and treatment received to date?
>
> Could you tell me about your last visit to the doctor or hospital, in which you had to make a decision about your healthcare?

Interviews are commonly used to gather data from adolescents.

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When you made the decision you described above, what goals and priorities were important to you?

I would like to shift now to talking about how you see decision-making in your future, understanding that your perspective may shift in time, or even as you talk about it with me, and that's ok. As you think about your future medical care, what types of decisions do you anticipate making? (Figueroa Gray et al., 2018, p. 675)

To collect data from large samples of people, scientists may develop and use **questionnaires**, also called surveys, which are made-up of sets of questions, typically multiple choice. Questionnaires can be administered in person, online, or by telephone, email, or postal mail. Questionnaires are popular data collection methods because they are easy to use and enable scientists to collect information from many people quickly, inexpensively, and anonymously (people can respond without sharing their names). The Monitoring the Future Study, for instance, is an annual survey of 50,000 8th-, 10th-, and 12th-grade students that collects information about their behaviors, attitudes, and values concerning drug and alcohol use (Miech et al., 2024). This anonymous survey permits scientists to gather an enormous amount of data while protecting adolescent participants from the consequences of sharing personal information that they might not otherwise reveal.

A challenge of self-report measures, both survey and interview, is that sometimes people give socially desirable answers rather than sharing their true feelings. They respond in accordance with how they would like themselves to be perceived or what they believe researchers want to hear. For example, a middle school student completing a survey about cheating might respond that they never cheat, despite sometimes looking at nearby students' papers during examinations. The student's answers might match the person they aspire to be or the behaviors they believe the world values—someone who does not cheat on exams—rather than their actual experience. Self-report data may not always reflect people's true attitudes and behavior. Also, people are not always fully aware of their feelings and may not provide useful insight into their thoughts and behavior through self-report measures (Newell & Shanks, 2014).

Physiological Measures

Our bodies are an important source of information that can be used to understand psychological phenomena. Physiological measures are increasingly used in developmental research because cognition, emotion, and behavior have physiological indicators. For example, do you feel your heartbeat more rapidly or do your palms grow sweaty when you give a class presentation? Increases in heart rate and perspiration are physiological measures of anxiety. Other researchers might measure cortisol, a hormone that increases when we experience stress (Simons et al., 2017).

Eye movements and pupil dilation can indicate attention and interest. For example, researchers who tracked participants' eye movements as they viewed Facebook feeds learned that people are naturally attracted to social and news posts that are rich with pictures and links, yet most people are unable to report what they have viewed, even immediately after viewing it (Vraga et al., 2016). Pupil dilation can indicate physiological arousal (Feurer et al., 2017).

Physiological measures of brain activity are a particularly promising source of data. Several tools are used to study the brain. **Electroencephalography (EEG)** measures electrical activity patterns produced by the brain via electrodes placed on the scalp. Researchers study fluctuations in activity that occur when participants are presented with stimuli or when they sleep. EEG recordings measure electrical activity in the brain, but they do not provide information about the location of activity or the brain structures that are the source of brain activity.

Computerized tomography (CT) compiles multiple X-ray images to create a 3-D picture of a person's brain, including brain structures, bone, brain vasculature, and tissue (Withers et al., 2021). CT scans can provide researchers with information about the density of brain structures to illustrate how the thickness of the cortex changes with development. Recording multiple X-ray images,

however, exposes research participants to higher levels of radiation than a single X-ray (Rehani & Nacouzi, 2020).

Positron emission tomography (PET) involves injecting a small dose of radioactive material into the participant's bloodstream to monitor the flow of blood (Gellman, 2020). Because blood flows more readily to active brain areas, PET scans allow researchers to identify what parts of the brain are active as participants view stimuli and solve problems.

Functional magnetic resonance imaging (fMRI) uses a powerful magnet and radio waves to measure blood oxygen level (Moriguchi, 2020). Active areas of the brain require more oxygen-rich blood, which fMRI can detect, enabling researchers to determine what parts of the brain are active as individuals complete cognitive tasks. fMRI images are much more detailed than PET scans and do not rely on radioactive molecules, which can only be administered a few times before becoming unsafe.

Diffusion tensor imaging (DTI) uses an MRI machine to track how water molecules move in and around the fibers connecting different parts of the brain (Lope-Piedrafita, 2018). DTI gauges the thickness and density of the brain's connections, permitting researchers to measure the brain's white matter and determine changes that occur with development.

An advantage of physiological measures is they do not rely on verbal reports and generally cannot be faked. On the other hand, although physiological responses can be recorded, they may be difficult to interpret. Excitement and anger may both cause an increase in heart rate.

Research Designs

Just as there are many ways to collect information, scientists have many options for conducting their studies. In addition to determining the research question and deciding what information to collect, scientists must choose a research design—a technique for conducting the research study. Developmental scientists employ several types of designs, summarized in Table 2.5.

Table 2.5 ▪ Comparing Research Designs

Design	Strengths	Limitations
Research Designs		
Case Study	Provides a rich description of an individual.	Conclusions may not be generalized to other individuals.
Correlational	Permits the analysis of relationships among variables as they exist in the real world.	Cannot determine cause-and-effect relations.
Experimental	Permits a determination of cause-and-effect relationships.	Data collected in artificial environments may not represent behavior in real-world environments.
Developmental Research Designs		
Cross-sectional	More efficient and less costly than the longitudinal design. Permits the determination of age differences.	Does not permit inferences regarding age change. Confounds age and cohort.
Longitudinal	Permits the determination of age-related changes in a sample of participants assessed for a period of time.	Time-consuming and expensive. Participant attrition may limit conclusions. Cohort-related changes may limit the generalizability of conclusions.
Sequential	Permits thorough analyses of developmental change. Simultaneous longitudinal and cross-sectional comparisons reveal age differences and age change as well as cohort effects.	Time-consuming, expensive, and complicated data collection and analysis.

Case Study

An individual with unique experiences, abilities, or disorders might prompt a developmental scientist to conduct a **case study**, an in-depth examination of a single person (or small group of individuals). A case study is intended to provide a detailed description of a person's life and influences on their development. It is conducted by gathering information from many sources, including observations, interviews, and conversations with family, friends, and others who know the individual. It may include samples or interpretations of a person's writing, such as poetry, journal entries, artwork, and other creations.

A case study results in a detailed description of an adolescent and is useful for documenting individuals with unique and unusual experiences, abilities, or disorders. However, conclusions drawn from a case study may not be generalized or applied to others because they are based on an extensive study of a single person. Case studies can be a source of hypotheses to examine in large-scale research.

Correlational Research

Are adolescents with high self-esteem more likely to excel at school? Are college students who work part-time less likely to graduate? These questions can be studied with **correlational research**, which examines relationships among measured characteristics, behaviors, and events. For example, one study of the relationship between physical fitness and cognitive and academic performance in Spanish adolescents found that those with higher aerobic capacity scored higher on measures of attention, concentration, and academics than did those with poorer aerobic capacity (González-Fernández et al., 2023). However, note that this correlation does not tell us *why* aerobic capacity was associated with academic achievement. Correlational research cannot answer this question because it simply describes relationships among variables; it does not enable us to reach conclusions about the causes of those relationships. It is likely that other variables influence both an adolescent's aerobic ability and achievement, such as general health. Correlational research does not enable us to determine the causes of behavior—for that, we need an experiment.

Experimental Research

Scientists who seek to test hypotheses about *causal* relationships, such as whether media exposure influences behavior or whether hearing particular types of music influences mood, employ **experimental research**. An experiment is a procedure that uses control to determine causal relationships among variables. Specifically, one or more variables thought to influence a behavior of interest are changed or manipulated while other variables are held constant. Researchers can then examine how the changing variable influences the behavior under study. If the behavior changes as the variable changes, this suggests that the variable caused the change in the behavior.

Gentile, Bender, and Anderson (2017) examined the effect of playing violent video games on early adolescents' physiological stress and aggressive thoughts. Participants were randomly assigned to play a violent video game (*Superman*) or a nonviolent video game (*Finding Nemo*) for 25 minutes in the researchers' lab. The researchers measured physiological stress as indicated by heart rate and cortisol levels before and after the adolescents played the video game. The participants also completed a word completion task that the researchers used to measure the frequency of aggressive thoughts. The researchers found that adolescents who played violent video games showed higher levels of physiological stress and aggressive thoughts than those who played nonviolent video games. They concluded that the type of video game influenced adolescents' stress reactions and aggressive thoughts.

Let's take a closer look at the components of this experiment. Conducting an experiment requires choosing at least one **dependent variable**, the behavior under study (in this case, two behaviors: physiological stress, indicated by heart rate and cortisol, and aggressive thoughts), and at least one **independent variable**, the factor proposed to change the behavior under study (type of video game). The independent variable is manipulated or varied systematically by the researcher during the experiment (a child plays a violent or nonviolent video game). Specifically, this manipulation is administered to one or more *experimental groups* or *test groups* (children who are asked to play a violent video game). The *control group* is treated just like the experimental group, except it is not exposed to the independent variable (children who play a nonviolent video game). After the independent variable is manipulated,

if the experimental and control groups differ on the dependent variables (levels of physiological stress and aggressive thoughts are different in the two groups), it is concluded that the independent variable *caused* the change in the dependent variables. That is, a cause-and-effect relationship has been demonstrated.

A procedure called **random assignment** is critical to drawing conclusions from experiments. When participants are randomly assigned to groups, each participant has an equal chance of being assigned to the experimental and control groups. Random assignment ensures that the groups are equal in all preexisting characteristics (e.g., age, ethnicity, and gender). Random assignment makes it less likely that preexisting differences between the groups are the cause of any observed differences in the outcomes of the experimental and control groups.

The type of experiment described here is good for identifying the impact of various interventions in the short term, but experimental research relies on experimenters' exerting control over variables. Developmental scientists frequently study topics that cannot be controlled, such as influences on academic achievement. In these instances, correlational research can shed light on relationships among variables. In addition, developmental scientists are interested in how people change over time. For this kind of study, researchers must carefully consider age and use specialized research designs, as described in the following sections.

Developmental Research Designs

Do shy children become shy adolescents? Do relationships with parents in early adolescence influence romantic relationships in emerging adulthood? These questions require that developmental scientists examine relationships among variables over time. The following sections discuss the designs that researchers use to learn about human development. As you learn about each design, consider how we might employ it to answer a question about development. For example, how does alcohol use among adolescents change from 6th grade through 12th grade?

Cross-Sectional Research

A **cross-sectional research study** compares groups of people of different ages at a single point in time. To examine how alcohol use changes from 6th through 12th grade, a scientist might visit a school system and administer a survey about alcohol use to students in Grades 6, 9, and 12. The resulting comparison describes how reports of alcohol use in 6th grade differ from reports of alcohol use in older adolescents in Grades 9 and 10. But are these changes in alcohol use age related or developmental change? In a cross-sectional research study, we will not know how the 6th-graders' alcohol use changes over the next few years. This type of study does not follow participants over time; it compares the current 6th-graders to current 9th- and 12th-graders. In other words, we don't know whether the 6th-graders will show the same patterns of alcohol use as the current 12th-graders when they are in 12th grade six years from now.

The conclusions researchers can draw about development are limited in a cross-sectional study because participants differ in both age and cohort. Recall from Chapter 1 that a cohort is a group of people of the same age who are exposed to similar historical events and cultural and societal influences. In this example, although 6th- and 12th-grade children may attend the same schools, they are different ages and cohorts with potentially different experiences. Suppose the school adopted a new early prevention program, leading the 6th-grade children to be taught by a new, improved prevention curriculum, whereas the 12th-graders received the old curriculum. Any differences in alcohol use may be due to age but also to different experiences.

Cross-sectional research is an important source of information about age differences, but it cannot provide information about age-related changes because participants are assessed only once.

Longitudinal Research Design

In contrast with a cross-sectional study, which examines children just once, a **longitudinal research study** follows the same group of participants over time. By repeatedly examining a set of children, we can describe how they change and the circumstances that surround their development. We can

witness development unfolding. Returning to the previous example, to examine how alcohol use changes from 6th to 12th grade, a developmental scientist using longitudinal research might administer a survey on alcohol use to 6th-graders and then follow up three years later when they are in 9th grade, then again when they are in 12th grade. If a researcher began this study in 2028, the last round of data collection would not occur until 2034. This longitudinal study would take six years to complete.

Because longitudinal research follows participants over time, scientists can study changes in their responses from 6th through 12th grade. However, longitudinal research studies only one cohort or age group over time. Are the observed findings due to developmental change, or are they specific to the children studied? Because only one cohort is assessed, it is impossible to determine whether the observed changes are developmental age-related changes or those unique to the cohort examined.

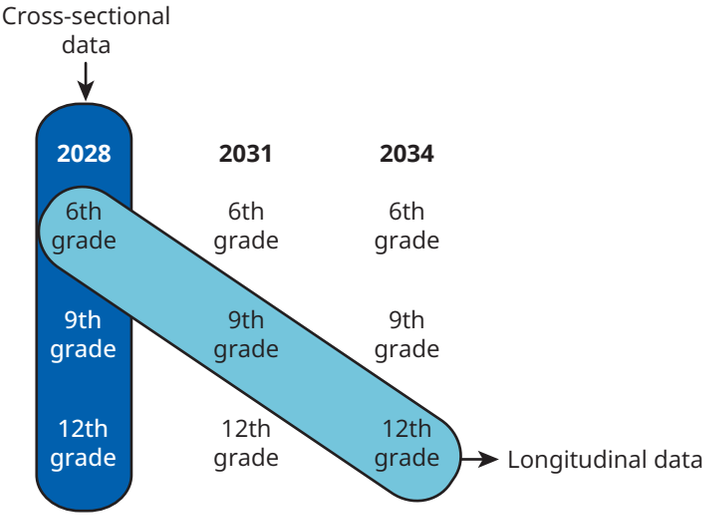
Sequential Research Designs

Sequential research combines the best features of cross-sectional and longitudinal research by assessing multiple cohorts over time, enabling scientists to disentangle the effects of cohort and age (Figure 2.6). Consider the alcohol use study of 6th-, 9th-, and 12th-graders once more. A sequential design would begin by measuring self-reports of alcohol use in 6th-, 9th-, and 12th-graders. Three years later, the 6th-graders are in 9th grade, the 9th-graders are in 12th grade, and the 12th-graders have presumably graduated from the school and are no longer under study. Next, a new group of 6th-graders is introduced to the study. Unique to the sequential design is the addition of new participants at various points throughout the study

The pattern continues. Three years later, that new set of 6th-graders is now in 9th grade, the 9th-graders are now in 12th grade, and the 12th-graders have aged out of the study; a new group of 6th-graders is introduced to the study; and so on.

The sequential design combines cross-sectional and longitudinal designs to provide information about age, cohort, and age-related change. The cross-sectional data (comparisons of 6th-, 9th-, and 12th-graders from a given year) provide information about age differences, meaning how the age groups differ from one another. The longitudinal data capture age-related change, meaning how the group of 6th-graders develops throughout school to 12th grade, because the participants are followed biannually. Because several cohorts are examined at once, the effect of cohort can be studied and conclusions about age-related developmental changes can be drawn. The sequential design is complex, but it permits human development researchers to disentangle the effects of age and cohort and answer questions about developmental change.

Figure 2.6 ▪ Sequential Design



Review

1. Compare observational, self-report, and physiological measures.
2. Differentiate among the case study method, correlational research, and experimental research.
3. Contrast cross-sectional, longitudinal, and sequential research designs.

Thinking in Context

1. Did you ever complete a survey in middle or high school? Do you remember the topic?
2. How do you think adolescents view surveys distributed in school? What are some challenges for researchers collecting survey data from adolescents?
3. Suppose you conducted a research study and found that 9th-graders who spent more time on social media, like Instagram and Snapchat, scored lower on a math achievement test. How would you describe these findings to a friend? Identify other variables that might influence this finding.

Apply

Suppose you wanted to study influences on academic achievement in high school.

1. What are some factors that might influence adolescents' achievement? Identify at least four.
2. Choose one factor to study. How might you measure it? Would you choose an observational, self-report, or physiological measure? Describe your choice.
3. What type of research design would you use? Why?
4. Suppose you wanted to understand how academic achievement changes from middle school to high school. Describe how you might study this question.

Research Ethics and Applied Developmental Science

2.6 Examine developmental scientists' ethical responsibilities when conducting research.

Many developmental scientists apply their research to help children, adolescents, and families. **Applied developmental science** is a field of study that examines the lifelong developmental interactions among individuals and their contexts and applies these findings to prevent and intervene in problems and promote positive development (Barbot et al., 2020; Fisher et al., 2013; Lerner, 2012). Applied developmental scientists study pressing social issues, such as ways to promote safe sex in adolescents, the impact of children's and adolescents' use of screens and social media, the juvenile justice system, and ways to help adolescents and families manage the stress that accompanied the COVID-19 pandemic (Brown et al., 2023; Odgers et al., 2020; Shorer & Leibovich, 2022). Enhancing the life chances of diverse groups of individuals, families, and communities requires a multidisciplinary approach that combines the expertise of scientists from many fields, such as human development, psychology, medicine, biology, anthropology, and more. This work poses unique ethical challenges.

Research Ethics

Research with adolescents can pose tricky ethical questions. For example, suppose a researcher wanted to determine the effects of an illegal drug on adolescent brain development, the impact of malnutrition

on growth, or the effects of bullying on emotional development. Would it be possible to design a study in which some adolescents were assigned to ingest the illegal drug? Or one in which adolescents are deprived of food or exposed to bullying? Of course not. These studies violate the fundamental ethical principles that guide developmental scientists' work. Developmental scientists must balance conducting scientifically sound research with protecting their participants' rights and welfare. Specifically, developmental scientists must (1) help and not harm participants, (2) be responsible to participants and society, (3) be honest and fair, and (4) respect participants' autonomy (American Psychological Association, 2017).

Help and Not Harm Participants

Researchers must protect and help the children, families, and communities in their work. They must maximize the benefits for participants and minimize the potential harm of their research. Above all, research participation must never pose threats to adolescents beyond those they might encounter in everyday life. Researchers are also responsible for aiding individuals by, for example, directing a distressed adolescent toward helpful resources.

Be Responsible to Participants and Society

Responsible scientists adhere to professional standards of conduct, clarify their obligations and roles to others, and avoid conflicts of interest. Psychologists who conduct research with children and parents must explain their role as scientists and that they are not counselors. They must help participants understand they are simply gathering information from them rather than conducting therapy.

Researchers' responsibility extends beyond their participants to society at large. Research findings often gain media attention. Researchers' findings sometimes have social and political implications they may not expect. For example, one highly publicized study compiled the results of many research studies examining college students who had become sexually involved with an adult before reaching the legal age of consent (Rind et al., 1998). The scientists concluded that the young people's adjustment and development varied widely and depended on several factors within the individual, situation, and broader context. The participants who were older when the relationship began, such as in late adolescence, just before reaching the age of consent, showed fewer adverse effects and appeared well adjusted. These findings were misinterpreted by some organizations, media outlets, and politicians as suggesting that sexual involvement with minors was acceptable or even beneficial—clearly not the researchers' conclusions (Garrison & Kobor, 2002). Scientists must work to ensure that their findings are accurately portrayed. This is admittedly difficult, but scientists must attempt to foresee ways in which their results may be misinterpreted and correct any misinterpretations that occur (Lilienfeld, 2002; Society for Research in Child Development, 2021).

Be Honest and Fair to Participants

Developmental scientists must be honest with participants. They must be mindful and attempt to keep the promises they make to children and families. Honesty can take the form of **debriefing** or informing participants about the purpose and results of their research after the study is completed. Researchers are also obligated to treat their participants fairly. **Justice** requires ensuring that the risks and benefits of research participation are spread equitably across individuals and groups. Every participant should have access to the contributions and benefits of research. When a treatment or intervention under study is found to be successful, all participants must be allowed to benefit from it.

Respect Participant Autonomy

Perhaps the most important principle of research ethics is respect for autonomy. Scientists have a special obligation to respect participants' **autonomy**, their ability to make and implement decisions. Ethical codes of conduct require that researchers protect adult participants' autonomy by obtaining **informed consent**—participants' informed, rational, and voluntary agreement to participate. Soliciting informed consent requires providing the individuals under study with information about the research study,

answering questions, and ensuring that they understand they are free to decide not to participate in the research study and will not be penalized if they refuse.

Respecting people's autonomy also means protecting minors and others incapable of making judgments and asserting themselves. Parents provide parental permission for their minor children to participate in research because researchers (and lawmakers) assume that minors cannot meet the rational criteria of informed consent (Remien & Kanchan, 2022). Although adolescents are minors, their growing capacities for decision-making require researchers to seek their agreement to participate in ways appropriate to their age and developmental capacities. Researchers demonstrate respect for adolescents' emerging sense of autonomy by seeking their **assent** to participate (Cayouette et al., 2022; Tait & Geisser, 2017; Weisleder, 2020).

Discussions about research participation should be tailored to children's development, including offering more detailed information and seeking more comprehensive assent as children grow older (Gaches, 2021). Moreover, seeking assent has the benefit of helping children learn how to make decisions and participate in decision-making within safe contexts (Neelakantan et al., 2023; Weisleder, 2020). For example, a researcher about to administer early adolescents a questionnaire about their experiences with parental divorce might explain the kinds of questions the adolescents will encounter, explain that in some cases a question might feel personal and might bring up memories, remind the adolescents that they are free to stop or skip any questions they choose; and, finally, remind the adolescents that if they feel uncomfortable or would like to talk to someone about their feelings about the issues examined in the study, a counselor is available or the researcher can help them find someone who can help them. Seeking assent from adolescents has the benefit of helping them learn how to make decisions and participate in decision-making within safe contexts (Oulton et al., 2016).

Ethical Issues in Studying Adolescents

Studying adolescents often raises unique ethical questions. Adolescent research participants are often very concerned about how their information and samples will be used and, in particular, whether information will be shared with their parents (Crane & Broome, 2017).

Sometimes, seeking consent from parents may interfere with researchers' goals or pose risks to minor participants. In one study, adolescents who identified as LGBTQ believed that participating in research on sexuality and health is important for advancing science yet indicated that they would not participate if guardian permission was required, citing negative parental attitudes or not being "out" about their LBGT identity (Macapagal et al., 2017). As one 15-year-old bisexual participant explained:

> I believe it could harm some [teens] because of the risk of being let out of the closest. I know some people whose family would not approve of any other sexuality [other than heterosexuality]. Such as my own, my mother would turn on me for not being her perfect image.

Adolescents may avoid participating in sensitive research if they fear their responses will be shared with parents (Neelakantan et al., 2023). In response to these ethical challenges, researchers frequently obtain passive consent to research sensitive topics with adolescents. Passive consent procedures typically involve notifying parents about the study and requiring them to reply if they do *not* want their child to participate. Studies that examine sensitive topics, such as risk behaviors, may benefit from using passive consent procedures because they are associated with more diverse samples of adolescents that better represent the population (Liu et al., 2017).

Studying LGBTQ adolescents poses ethical and practical challenges.
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Another issue developmental scientists face in studying adolescents is that the researchers' desire to learn about development and solve problems may conflict with the need to protect adolescents in research studies. Researchers generally promise participants, including adolescents, **confidentiality**, that their responses

will remain confidential and will not be disclosed to others. Unsurprisingly, adolescents value confidentiality (Coninck et al., 2021).

Suppose a researcher studying adolescents learns that a participant is in jeopardy, whether they are engaging in health-compromising behaviors (e.g., cigarette smoking, unsafe driving), contemplating suicide, or engaging in illegal or harmful activities (e.g., drug addiction, stealing, violence). Does the researcher have a duty to disclose the risk to an outside party that can help the adolescent, such as parents? Does the researcher's promise of confidentiality outweigh the duty to disclose?

Researchers who study risky and health-compromising behaviors *expect* to encounter participants who are engaged in potentially dangerous activities. Helping the adolescent might involve removing them from the study and potentially compromise the study. Adolescents generally expect that researchers will maintain confidentiality (Fisher et al., 1996); violating their confidentiality may be harmful. Is there ever an instance where a researcher should break confidentiality and disclose information about an at-risk adolescent? Adolescents and parents tend to have different opinions about research disclosures; parents often want to receive their children's research information, but adolescents tend to report wanting to withhold private and sensitive findings (Brawner et al., 2013).

Ethical guidelines published by research and medical associations address researchers' obligations to help and not harm and to protect participants' confidentiality, but they generally fail to offer specific recommendations about how researchers can manage the conflicting duties to maintain confidentiality and disclose participant problems (Hiriscau et al., 2014; Sharkey et al., 2017). Instead, researchers must decide for themselves how to balance their adolescent participants' sometimes conflicting obligations.

Review

1. What are the four ethical duties that apply to researchers' work?
2. What is the difference between informed consent and assent?
3. What are some ethical issues that may arise when studying adolescents?

Thinking in Context

Researchers may commonly encounter adolescents with problems, big and small.

1. What kinds of problems do you think merit a researcher taking action?
2. In those cases, what action should a researcher take?
3. Is it ever permissible to do nothing? To tell a parent? What guidelines would you use in making these decisions?

Apply

As an adolescent development researcher, you are planning to conduct a study on risky behavior with high school students.

1. Imagine your participants. Describe their characteristics. Provide examples of intersectionality and anticipate how intersections of ethnicity and race, socioeconomic status, and gender might affect participants' responses.
2. In your view, what ethical principle is the most important for you to uphold? Why?
3. What are the pros and cons of parental consent and passive consent? Which would you choose?

Chapter Summary

1. **Discuss four key questions that guide the study of adolescent development.**

   Developmental scientists generally agree that nature (biological factors, including genetic traits and maturation) and nurture (environmental factors, including the physical and social environment) interact to influence adolescent development. Development reflects both continuous (gradual) and discontinuous (abrupt, stagelike) change. Adolescents actively shape their development through their characteristics and by interacting with and transforming their contexts as they explore interests, engage in social interactions, and navigate their physical and social environments. Adolescents vary in their developmental paths, with some closely following group averages while others take a markedly different course. Individual differences occur in onset of developmental phenomena, course of change, and ultimate abilities acquired.

2. **Summarize classic psychoanalytic and behaviorist theories and their approach to describing adolescent development.**

   Psychoanalytic theories describe development as the result of the interplay of inner drives, memories, and unconscious conflicts. Sigmund Freud viewed development as progressing through psychosexual stages, with adolescents entering the final stage, the genital stage, suggesting that he viewed adolescents as similar to adults. Due to its emphasis on childhood sexuality and lack of falsifiability, Freud's framework is not widely accepted today. Erik Erikson described development as the progression through eight psychosocial stages, with adolescents facing a crisis of identity and role confusion in which they must develop a sense of self by exploring possibilities and committing to those that fit. Behaviorist theories, also known as learning theory, study only observable behavior and emphasize the role of the environment in controlling behavior. Classical conditioning, discovered by Ivan Pavlov, is a type of learning in which a person or animal forms associations between environmental stimuli and physiological and emotional responses. B. F. Skinner's theory of operant conditioning holds that behavior becomes more or less probable depending on its consequences. Although behaviorist theories do not explicitly address adolescents, classical and operant conditioning can account for some adolescent behavior. Developmental scientists disagree with operant conditioning's emphasis on external events over internal events as influences on behavior.

3. **Compare cognitive-developmental, information processing, sociocultural, and social cognitive theories.**

   According to Piaget's cognitive-developmental theory, children actively explore their world, organizing what they learn into cognitive schemas through assimilation and accommodation. Piaget proposed that children's drive for cognitive equilibration and to construct more sophisticated cognitive schemas that match reality propels them through four stages of cognitive development, culminating in format operational reasoning in adolescence. Vygotsky's sociocultural theory describes cognitive development as a social process that relies on interactions with adults, more expert peers, and other members of an individual's culture in which they learn about their culture and acquire cultural tools, including language, that transmit ways of thinking. Information processing theory is a collection of theories that examine how people take in, store, and use information to solve problems. The cognitive system comprises three inborn mental stores, sensory register, working memory, and long-term memory, that are limited in capacity. Development entails gradual changes in the efficiency and speed with which we think. Albert Bandura's social cognitive theory incorporates cognition with behaviorist concepts, viewing the environment as a vital influence on behavior. Development from this perspective is the result of interactions among individuals' physical and social environment, their cognition and personal characteristics, and their behavior (reciprocal determinism).

4. **Discuss bioecological systems theory and dynamic systems theory.**

   A system is a set of interconnected interacting parts that work together as a network. Bronfenbrenner's bioecological systems theory explains development as the result of the ongoing interactions among biological, cognitive, and psychological changes in individuals, who are embedded in a series of systems in which they interact: microsystem, mesosystem, exosystem, macrosystem, and chronosystem. Dynamic systems theory emphasizes the dynamic interplay among individuals' maturation, contextual circumstances, supports, and constraints along with their unique goals. Each person is unique, with specific goals, motivations, and environmental circumstances that offer distinct opportunities and constraints for development.

5. **Describe methods and designs used to study adolescent development.**

   A case study is an in-depth examination of an individual. Observational measures are methods that scientists use to collect and organize information based on watching and monitoring people's behavior. Interviews and questionnaires are called self-report measures because they ask the persons under study questions about their own experiences, attitudes, opinions, beliefs, and behavior. Physiological measures gather the body's physiological responses as data. Scientists use correlational research to describe relations among measured characteristics, behaviors, and events. To test hypotheses about causal relationships among variables, scientists employ experimental research. Developmental designs include cross-sectional research, which compares groups of people at different ages simultaneously, and longitudinal research, which studies one group of participants at many points in time. Cross-sequential research combines the best features of cross-sectional and longitudinal designs by assessing multiple cohorts over time.

6. **Examine developmental scientists' ethical responsibilities when conducting research.**

   Developmental scientists balance conducting scientifically sound research with protecting their participants' rights and welfare. They must (1) help and not harm participants, (2) be responsible to participants and society, (3) be honest and fair, and (4) respect participants' autonomy. Ethical codes of conduct require that researchers protect adult participants' autonomy by obtaining informed consent—their informed, rational, and voluntary agreement to participate. Researchers respect adolescents' emerging sense of autonomy by seeking their assent to participate. Adolescent research participants are often very concerned about how their information and samples will be used and in particular about confidentiality; that is, whether information will be shared with others, including their parents.

Key Terms

accommodation
applied developmental science
assent
assimilation
attention
autonomy
behaviorism
bioecological systems theory
case study
central executive
chronosystem
classical conditioning
cognitive equilibration
cognitive schemas
cognitive-developmental theory
computerized tomography (CT)
confidentiality
continuity-discontinuity
correlational research
cross-sectional research study
debriefing
dependent variable
diffusion tensor imaging (DTI)
dynamic systems theory
electroencephalography (EEG)
executive function
exosystem
experimental research
formal operational reasoning
functional magnetic resonance imaging (fMRI)
independent variable
informed consent

justice
longitudinal research study
long-term memory
macrosystem
mesosystem
microsystem
naturalistic observation
nature-nurture debate
observational learning
ontogenetic development
open-ended interview
operant conditioning
positron emission tomography (PET)
psychoanalytic theory
punishment
questionnaires
random assignment
reciprocal determinism
reinforcement
scientific method
sensory register
sequential research
social cognitive theory
sociocultural theory
structured interview
structured observation
theory
working memory