

GLOBAL
EDITION



The Journey of Adulthood

EIGHTH EDITION

Barbara R. Bjorklund



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The Journey *of* Adulthood

EIGHTH EDITION
GLOBAL EDITION

Barbara R. Bjorklund

WILKES HONORS COLLEGE OF FLORIDA ATLANTIC UNIVERSITY

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*For Lily Pearl Zeman, my ninth grandchild, whose
arrival was every bit as glorious as my first!*

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Preface

The Journey of Adulthood is now in its eighth edition, and it continues to capture the dynamic process of adult development from early adulthood to the end of life. Its core is made up of research findings from large-scale projects and major theories of adult development, but it also reflects smaller studies of diverse groups, showing the influences of gender, culture, ethnicity, race, and socioeconomic background on this journey. I have balanced new research with classic studies from pioneers in the field of adult development. And I have sweetened this sometimes medicinal taste with a spoonful of honey—a little personal warmth and humor. After all, I am now officially an older adult who is on this journey along with my husband, looking ahead at the examples our parents' journeys gave us, and back toward our children, who are blazing their own trails. As of this edition, we have nine grandchildren—six of whom are beginning their own journeys of adulthood either as college students or starting their careers.

New in This Edition

- New information on electronics use: the proportion of people of different ages using the Internet, cell phones, e-readers, and e-games; the sleep-related problems related to using electronic “blue screen” devices before bedtime or during the night; the popularity of online dating services and some words of caution about their claims; and the relationship between early hearing loss and the use of MP3 players at top volume with earbuds.
- Increased importance of animals in our lives: the use of dogs and monkeys as assistance animals for people with disabilities; the use of comfort animals for people in stressful situations or with mental health problems; and the social support people of all ages report receiving from their pets.
- New research on veterans: the association between head injuries and PTSD; the association between head injuries and dementia; the collaboration between researchers in positive psychology and the U.S. Army to boost resilience in combat troops.
- More studies of the effects of discrimination and inequality: older people reminded of the “poor memory” stereotype score lower on memory tests; young girls of mothers who believe the “girls are not good at math” stereotype score lower on math tests; people in minority groups who perceive they are discriminated against have lower levels of health; African-American adults experience middle age differently than other groups; same-sex couples experience more violence and aggression, less family support, less openness about their relationships; the increase in neighborhoods designated “food deserts” because of scarcity of grocery stores and abundance of fast-food restaurants.
- More research on a wider range of younger and older adults. More older people are in the workforce in the United States and some European countries; longitudinal studies of attachment between infancy and age 18; long-time married couples report being “very intensely in love”; social convoys of people from emerging adulthood to age 90; increase in sex without commitment, or “hookups” for young adults; survey results of sexuality from age 70 to 94.

- New information on top age-related diseases, including heart disease, cancer, diabetes, and Alzheimer's disease. Updated risk factors for common age-related conditions, including cataracts, glaucoma, macular degeneration, osteoporosis, and osteoarthritis. All the tables of risk factors contain information about what younger adults can do for prevention. New findings on genetic contributions to age-related diseases.

The first chapter of the book contains the basics for the course—definitions, methods, and guiding perspectives for the study of adult development. The next seven chapters cover traditional developmental topics, featuring recent research, classic studies, current theories, new directions, and practical applications. The next three chapters cover topics not traditionally found in adult development texts, but which I feel are important to round out a student's experience in this course—the quest for meaning; the inevitability of stress, coping, and resilience in adult life; and the way we face our own deaths and that of our loved ones. The final chapter takes a chronological look at adult development, in contrast to the topical themes in the earlier chapters, and also suggests a model of adult development that will pull the threads together and tie up loose ends.

Changes in the Field of Adult Development

The study of adult development is a fairly new field, and it expands exponentially from year to year. It began as a field of psychology, but more and more disciplines have shown interest in the changes that take place over the adult years. This book includes information from researchers who identify themselves as psychologists, sociologists, anthropologists, neuroscientists, epidemiologists, behavior geneticists, cellular biologists, biogerontologists, and many other types of scientists. The terminology and methods in these fields have become more and more similar, and many researchers publish in the journals of a variety of fields. This edition of *The Journey of Adulthood* reflects the wonderful collaboration going on and the richness of a number of multidisciplinary projects. It is an exciting time in developmental science, and this book reflects that energy.

Some of the projects that have been tapped for this textbook are the Midlife in the United States Study (MIDUS), the Berlin Study of Aging, the Grant Study of Harvard Men, the National Comorbidity Study, the Nun Study of the School Sisters of Notre Dame, the Victoria Longitudinal Study, the Swedish Twin Study, the National Survey of Sexual and Health Behavior, The Women's Health Study, and the National Longitudinal Mortality Study.

To emphasize these collaborations, I have identified each major researcher or theorist with his or her field of study. Two editions ago I was struck with the diversity of scientific fields contributing to the adult development literature. I want this book to reflect that diversity. When I discuss some particular work in detail, I give the full names of the researchers and how they identify their field of study. I hope that the students who are interested in adult development will take note and consider these areas when they declare their majors or make plans for graduate school. As professors, we need to remember that we not only teach the content of the courses, but also guide our students in career decisions.

Another change in the field of adult development is that increasingly more research projects reported in major journals are done by international groups of researchers in settings all over the developed world. We no longer are limited to information on adults in the United States; we also have research being done by Swedish, Japanese, and Egyptian scientists using Swedish, Japanese, and Egyptian participants. When the findings are similar to studies done in the United States, we can be more confident that the developmental phenomenon being studied is an integral part of the human experience and not something particular to people in the United States. When the findings are different from studies done in the United States, we can investigate these differences and find their roots.

I have identified these international research teams and the nationalities of their participants. I hope this accentuates the global aspects of our academic community, and as a seasoned traveler myself, I hope it inspires students to consider “study abroad” programs.

I include full names of major researchers and theorists when I discuss their work in detail. Seeing the first and last names makes the researchers more real to the students than conventional citations of “last names, comma, date.” Full names also reflect the diversity of scientists—often their gender and their national or ethnic backgrounds. Our students represent a wide range of races and ethnicities, and the time of science being the sole domain of an elite group most of us cannot identify with is gone.

One of the most exciting changes in the field of adult development has been its expansion to emphasize a wider and wider range of age groups. When I first began writing in this area, the focus of interest was older adults. The last two editions of this book have featured more and more studies of young adults, middle-aged adults, and emerging adults. This edition has added more research on the opposite end of the age spectrum—those who are 75, 80, 90 years of age and older. Although having people in this age group is nothing new, the growing numbers of them have made it important (and relatively easy) to include them in studies of adult development. Clearly the study of adult development is no longer the study of certain specific age groups; it is now truly a study of every aspect of adulthood. I have tried to capture this inclusion by choosing topics, examples, opening stories, photos, suggested reading, and critical thinking questions that represent the entire adult life span.

Changes in the World Around Us

Since the last edition of this book, there have been many changes in the world around us. As I write this preface, we seem to be recovering from the financial setbacks that began in 2008. Unemployment and underemployment are still a problem for many, and almost every family has been touched by financial setbacks of one sort or another. Troops are coming back from Iraq, but many have war-related disabilities that include posttraumatic stress disorder (PTSD) and traumatic brain injury (TBI). Single-parent families and dual-earner families in the United States (and in many other developed countries) are having a rough time; they receive little cooperation from the government, the workplace, or the community to assist them in caring for both job and family. Many older women, especially those who live alone, are living below the poverty line. The United States has the highest rates of mental disorders of any developed country, and most of the people experiencing these symptoms do not get adequate treatment. Unhealthy lifestyles are resulting in increased health problems for many adults in the developing world, and the ages of those affected are extending to both the younger and older end of the spectrum. Although I try to maintain a positive tone in this book, these aspects of adult life are realities, and I have included them in the topics discussed in *The Journey of Adulthood*.

Other changes in the world around us are more positive. Health awareness is increasing at all ages, advances are being made in many areas of disease prevention, detection, and treatment, and a greater percentage of people in developed countries are living into old age. The rate of cancer deaths continues to decline as advances are made in early detection and treatment. Although there is still no treatment for aging and no sign of a way to increase the existing maximum life span, people are increasing the number of healthy years in their lives. Programs such as hospice are making it possible for an growing number of people to choose to have “a good death” when that time comes. Women are making great strides in professional careers and in their positive adjustment to children leaving home and widowhood. Communication technology has made it easier for families to stay in touch and for older adults to live independently. The average age of people using social media, cell phones, and e-games is increasing. These are also among the topics selected for this book.

Changes in the Classroom

Courses in adult development are offered in all major colleges and universities in the United States and are becoming popular around the world. It is safe to say that graduates in almost all majors will be working in fields that deal with the changes that occur during adulthood. It is also safe to say that students in all majors will be dealing with the topic on a personal level, both their own progress through adulthood and that of their parents. My students at Florida Atlantic University this semester are majoring in psychology, counseling, nursing, criminal justice, premedical sciences, prelaw, social work, occupational therapy, sociology, and education. About one half are bilingual, and about one third speak English as a second language. The majority will be the first in their families to graduate from college. I no longer assume that they have the same academic backgrounds as students a decade ago. For these reasons, I include basic definitions of key terms in the text of each chapter, clear explanations of relevant statistical methods, and basic details of major theories. I meet the readers knowing that the “typical student” is an outdated stereotype, but I meet them with respect for their intelligence and motivation. I firmly believe that it is possible to explain complex ideas clearly and connect with students from a variety of backgrounds and experiences. I do it every week in my lectures, and I do it in this book.

Highlights of Chapters in This Edition

Chapter 1 serves as an introduction to the study of adult development, beginning with the concept of development being both stable and changing. I use my own journey of adulthood as an example of these concepts and invite students to think of their own lives in these terms. Two guiding perspectives are introduced, Baltes’s life-span developmental approach and Bronfenbrenner’s bioecological model. Hopefully students will feel comfortable with those straightforward theories and move smoothly into the next section on developmental research. I don’t assume that all students have taken a research methods class, so I limit the methods, measures, analyses, and designs to those that are used in later chapters. In fact, I use some of these later studies as examples, hoping that students will feel comfortable with them when they encounter them later in the book.

New in this chapter:

- Current events added to table of normative history-graded influences.
- The role of *methylation* in epigenetic inheritance.

The theme of **Chapter 2** is *primary aging*, the physical changes that take place predictably in most of us when we reach certain milestones in our journeys of adulthood. Again, I begin with some basic theories, including Harmon’s theory of oxidative damage, Hayflick’s theory of genetic limits, and the theory of caloric restriction. Then I cover age-related physical changes, including outward appearance, the senses, the bones and muscles, the cardiovascular and respiratory systems, the brain and nervous system, the immune system, and the hormonal system. Most of the age-related changes in these systems are gradual, but much can be done to avoid premature aging (and much of that can be done in early adulthood, such as avoiding excessive exposure to sunlight and tobacco use). Next I cover four areas of more complex functioning—(a) athletic abilities; (b) stamina, dexterity, and balance; (c) sleep; and (d) sexual activity, all of which decline gradually with age. I cover some of the ways these declines can be slowed, but end the chapter with the caution that so far, we have no proven way to “turn back the clock” of time.

New in this chapter:

- Research on noise exposure levels for MP3 players.
- Evidence that high levels of sports participation in adolescents is a risk factor for osteoarthritis in young and middle adulthood.
- Studies of master athletes (up to age 90) and their oxygen uptake abilities.
- The connection between *blue screens* (smart phones, tablets, e-games) and insomnia.
- The prevalence of *hookups*—casual sex without commitment—among emerging adults.
- The concept of *food deserts*—neighborhoods with a high number of fast-food restaurants and a low number of stores selling healthy food.
- Results of a new national survey on sexual activities for adults aged 70 to 94.
- The question of *resveratrol* as an anti-aging supplement.

Chapter 3 is about age-related disease, or *secondary aging*. I try to keep this separate from the normal changes discussed in the previous chapter. Not everyone suffers from these diseases no matter how long they live, and many age-related conditions can be prevented or cured. I start with data of mortality rates by age because I think it helps students put the risk of death and disease into perspective. For most of our students, the risk of premature death is very low, and the top cause of death is accidents. I then discuss four of the top age-related diseases and explain their causes, their risk factors, and some preventative measures. These are heart disease, cancer, diabetes, and Alzheimer's disease. I try to balance good news (lower rates of cancer deaths due to early detection and treatment, lower disability rates in the United States) with the bad (rising rates of diabetes at all ages, still no cure for Alzheimer's disease). The second part of the chapter is about mental health disorders. I try to impress on the students that most of these disorders begin early in adulthood (or even in adolescence) and that most can be treated. However, the individuals suffering from these disorders (or their families) need to seek help and seek competent help. I end the chapter by telling that these physical and mental health disorders are not distributed randomly. Some groups are more apt to suffer than others, depending on their genes, socioeconomic background, gender, lifestyle, personality patterns, and events that happened to them in very early childhood or even before birth.

New in this chapter:

- New findings on genes that are associated with Alzheimer's disease.
- The relationship between sports-related head injury and Alzheimer's disease.
- The prevalence of head injury in combat veterans and the increased risk of PTSD and Alzheimer's disease.
- The health risk of perceived racial discrimination.
- The rising use of *assistance animals* and *comfort animals* to foster independence in people with disability.
- The increased number of people living with chronic disease in our communities and how we are learning to put the emphasis on the *people* part of the label.

Cognitive aging is covered in **Chapter 4**. I had discussed a little about primary aging of the brain in Chapter 2 and Alzheimer's disease in Chapter 3, but this chapter is about age-related changes in intelligence, as measured by IQ tests, and changes in specific components of memory, in terms of information processing theory. I explain how flaws in early research led to the conclusions that intelligence declines sharply with age, starting about age 40. Newer longitudinal studies with improved methodology show an increase in IQ scores until about 65, then a gradual decline, growing steeper around age 80. For components of intelligence, the fluid abilities that are controlled by biological processes show

more of a decline than the crystallized abilities, which depend on formal schooling. Various memory components follow the same pattern—some decline more sharply than others. It is possible to train older people to show limited improvement in some memory processes. Decision making and problem solving are more real-world tasks, and older people are able to do them well while using less time and less examination of facts than younger people.

New in this chapter:

- New research on executive function and working memory.
- Evidence of stereotype threat affecting memory abilities of older people.
- Assistance with medication adherence provided by electronic devices and pharmacy packaging.
- Increased use of social networking by older adults, along with cell phone use and e-games; e-readers have not gained as much in popularity.
- New research on effective driver's training for older adults.

Chapter 5 is about social roles and the changes that takes place during adulthood. Social roles refer to the attitudes and behaviors we adopt when we make a transition into a particular role, such as worker, husband, or grandmother. This chapter covers changes within a person due to these life transitions. Gender is a major part of social roles, and several theories suggest how we learn what attitudes and behaviors fit the gender roles we fill. Bem's learning schema theory, Eagly's social role theory, and Buss's evolutionary psychology theory are presented. Various social roles, arranged chronologically, are discussed that include the transition from living in one's parents' home to living independently to living with a romantic partner in a cohabitation relationship or a marriage. Being part of a committed couple is related to good mental and physical health. Another role transition is from being part of a couple to being a parent. Social role transitions in middle adulthood involve going from having children living in your home to having children who are independently living adults to becoming a grandparent. Another role in middle adulthood is often as caregiver for one's own parents. In late adulthood, many move into the role of living alone and becoming a care receiver. Not everyone fits these role transitions. Some adults never marry, and some never have children but still have happy and productive lives. Lots of new social roles appear when there is a divorce in a family and then a remarriage, as most students know firsthand.

New in this chapter:

- Research on emerging adults and young adults who return to their parents' home due to the poor economy in the last decade. Findings show that it fosters intergenerational solidarity.
- Increased cohabitation rates in the United States and other countries that have more progressive attitudes toward women and lower religious involvement.
- New studies about the toll of long-term unhappy marriages on self-esteem and health.
- Lower birthrates for teens and higher birthrates for women over 40 in the United States.
- More gender equality in housework and child-care tasks for dual-career parents.
- Research on how same-sex parents divide up housework and child-care tasks.
- Racial inequality in how roles in middle adulthood are experienced.
- The concept of *grandfamilies*, children being raised by grandparents when parents are not present in the household.
- Increase in one-person households.

Social relationships are covered in **Chapter 6** and differ from social roles because they involve two-way interactions between individuals, not just the behavior a person performs in a certain role. This is a difficult distinction, but there is just too much material on

social-related topics for one chapter, so this seems like a good division. It also roughly fits the division between sociology studies (roles) and psychology studies (relationships). I begin this chapter with Bowlby's attachment theory, Ainsworth's model of attachment behaviors, Anotnucci's convoy model, Carstensen's socioemotional selectivity theory, and Buss's evolutionary psychology approach. Then I start with various relationships adults participate in, beginning with intimate partnerships, which includes opposite sex cohabitation, marriage, and same-sex partnerships. Next is parent-child relationships in adulthood, grandparent-grandchild relationships, and sibling relationships in adulthood. The chapter ends up with a section on friendship. Students of all ages relate to this chapter personally and it works well in the middle of the book.

New in this chapter:

- Several studies investigating online dating services along with some advice about how best to use them.
- Comparison of social convoys for age groups up to 90 years.
- Longitudinal study of attachment from birth to 18 years.
- Five key components that predict very accurately a couple's relationship quality 5 years into the future.
- Long-term married couples—almost half report being “very intensely in love.”
- Long-term unhappily married couples—lower mental and physical health than those who divorced and remarried or divorced and did not remarry.
- New research on gay, lesbian, and bisexual couples.
- Increase in late-life divorces and their effect on adult children.
- The effect adult children's problems have on older parents.
- Increase in contributions from grandparents in time, gifts, and money.
- The effect involved grandparents have on young families.
- Adult siblings raising younger siblings.
- The role of pets as part of one's social network.
- The role of Facebook friends as part of one's social network.

The topics of work and retirement are covered in **Chapter 7**. When I started writing this textbook, students applied the information in this chapter to their futures or to their parents lives, but recently many apply it to themselves because they are part of the labor force, and some are retraining for a second career. A few are even retired and attending college as a pastime. I start the chapter with Super's theory of career development and Holland's theory of career selection. Students are usually familiar with vocational preference tests and interested in finding out what type of work they would enjoy most. Gender differences are an important part of career selection, and I question the reasons that even though women are found in almost every line of work and attend college in greater numbers than men, they still make less money and are not equally represented in top-paying, high-prestige jobs. The next section deals with age differences in job performance and job satisfaction. The section on work and personal life includes how jobs can affect individuals, intimate relationships, and responsibilities for other family members, including how household chores are divided up. The section on retirement includes reasons a person decides to retire or not, the effects of retirement, and some middle ground between full-time work and full-time retirement. I try to impress on the young student that much of one's quality of life in retirement depends on early planning ahead, and I hope they take that more seriously than I would have at their age.

New in this chapter:

- New research on gender differences in the workplace, including children's reactions to parents' sexism.
- Recent data on workforce participation at different ages.

- Discussion of how the recent recession affected people in the workplace, including an increase in suicides that match the downturn in the economy.
- Increase in “nontraditional” students in college (38%).
- The concept of *work engagement*, as opposed to *work burnout*.
- Increase in number of dual-employed parents and increase in fathers’ participation in child care and household chores.
- Increase in older adults in the U.S. workforce and in some European countries.
- New studies of the benefits of doing volunteer work after retirement.

The topic of **Chapter 8** is personality. I divide the chapter into two parts—first the research on personality structures, featuring Costa and McCrae’s Five-Factor Model, and then I discuss some of the grand theories of personality, including Erikson’s theory of psychosocial development, Loevinger’s theory of ego development, Vaillant’s theory of mature adaptation, Gutmann’s theory of gender crossover, and Maslow’s theory of positive well-being. I selected these from the many because they have continued to inform research into age-related personality stability and change.

New in this chapter:

- A new study of cohort effects in the way personality factors are expressed.
- New cross-cultural research that yields different personality factors for people in collectivist cultures.
- Erikson’s stage of identity versus role confusion applied to age of self-identification by gay, lesbian, and bisexual youths.

Chapter 9 presents information on the quest for meaning and how it is manifested at different stages of adult life. This continues to be the most controversial chapter in the book, with some adopters rating it as the best chapter in the book and others questioning why it is included. My belief is that it fills an important place in the journey of adulthood as we question how this journey started and where, exactly, we are going. It’s a chance to look a little further up the road and a little further back than the other chapters give us. I start by showing how the topic of religion and spirituality has ballooned in empirical journals over the last four decades and the importance of having a sense of the sacred in our lives. Then I cover some diverse theories, including Kohlberg’s theory of moral reasoning and Fowler’s theory of faith development, showing the similarities in those and two of the theories from the personality chapter we just covered, Loevinger’s theory of ego development and Maslow’s theory of positive well-being. I illustrate this complex comparison in a table that lays them out side-by-side to make it easier to understand. I conclude the chapter with material about mystical experiences and transitions, which William James, one of the founding fathers of psychology, wrote about in 1902.

New in this edition:

- Increase in the percent of people in the United States who report belief in God.
- Argument that spirituality is an evolved trait in humans.
- Research on the relationship of religious beliefs and sound mental health, even when SES, health behaviors, and specific religious practices are considered.

The related topics of stress and resilience comprise the subject matter for **Chapter 10**. This type of research is usually done by health psychologists and medical researchers but has recently been of interest to social psychologists, sociologists, forensic psychologists, and military leaders. This is another chapter that students take very personally because most are dealing with more than their fair share of stressors. I begin with Selye’s concept of the general adaptation syndrome and then present Holmes and Rahe’s measurement of life-change events. Research is cited to show that high levels of stress are related to physical and mental

disorders. The timely topic of PTSD is covered, and individual differences, such as gender and age, are included. I cover racial discrimination as a source of chronic stress and talk about stress-related growth—the idea that what doesn't kill you makes you stronger. Types of coping mechanisms are presented, followed by the topic of *resilience*. Recent studies have shown that the most frequent reaction to trauma is resilience and that some people are more apt to be resilient than others.

New in this chapter:

- Research using the life-change events scale predicts heart disease and diabetes 5 years later.
- A new study showing that people with long-lasting reactions to stress are more susceptible to mood disorders.
- Evidence showing that 10% of people who experience trauma will have PTSD a year later.
- Studies done with 2,000 people who survived the September 11 terrorist attack show that the older group (75 to 102 years of age) had higher stress symptoms immediately after the event, but declined rapidly to the level of younger adults after 12 months.
- All age groups of survivors of the September 11 terrorist attack showed a return of stress symptoms on anniversaries of 9/11.
- The concept of *human social genomics*—stressful life events can change our genomes.
- *General Assessment Tool*—an assessment tool the U.S. Army has worked on with the American Psychological Association to evaluate soldiers in terms of emotional, social, family, and spiritual fitness. Those who are low in any aspect can get counseling. It predicts PTSD risk and may be put into use in the near future.

Chapter 11 covers death—how we think about it at different ages, how we cope with the death of loved ones, and how we face the reality of our own deaths. There are mixed opinions about where this chapter belongs in this book. Some reviewers suggest that it be placed earlier in the book because it leaves a depressed feeling at the end of the course. I don't disagree with that, but I can't find any agreement about what would be a better placement. I begin the chapter with a discussion of how we acquire an understanding of death, both the deaths of others and the eventual death of ourselves. This includes abstract methods like overcoming the fear of death as well as practical methods, like making a living will and becoming an organ donor. The place of one's death is important to many people, and most want to die at home with their families. That is becoming more feasible because of the hospice approach, and I explain that in detail. Others who are terminally ill would like to choose the time of their deaths, and that has become possible in several states that have legalized physician-assisted suicide, and I explain how that is arranged and what types of people make that decision. For the next section, I have compiled numerous mourning rituals that take place in different cultures in the United States. It is not an exhaustive list, and there may be many exceptions, but it is a good way to start a discussion about our multicultural society and about respecting and understanding others at these most personal times. The chapter ends on a hopeful note with a study of bereavement that shows that the most common response to the loss of a spouse in older adulthood is resilience.

New in this chapter:

- Cross-cultural studies show that the attitudes toward death are similar in many countries (United States, Egypt, Kuwait, Syria, Malaysia, Turkey).
- Increase in number of people who have living wills at all ages.
- Information that Facebook lets you announce your status as an organ donor on your wall.

In **Chapter 12**, the final chapter, I wrap up everything in the previous 11 chapters and do so in a chronological order rather than the topical arrangement these chapters feature. I add in the relevant new material and present my own model of adult development complete with a flowchart of how we move from disequilibrium to equilibrium in several areas of our lives. I also include a master table of age-related changes throughout adulthood.

Suggested Reading, Critical Thinking Questions, and Key Terms

At the end of each chapter is a list of **Suggested Reading**. These books and journal articles are arranged in three categories. First is *Reading for Personal Interest*, which includes 29 popular books that are new to this edition and written for the educated layperson (which our students are). Many of these are written by researchers featured in the chapter. I try to include books that reflect a wide age range of adulthood. Some are how-to books, some are memoirs or biographies, and I also snuck in a few novels. I have personally read every one of these books myself, a nice bonus of this job! Following those books are *Classic Works*. I try not to forget the “giants on whose shoulders we stand.” This collection consists of 28 books and articles. Finally, I have a section of 26 new *Contemporary Scholarly Works* that give students some good review articles or book chapters for a more in-depth account of some of the topics in the chapter.

As the students read through the chapters, they are met with **Critical Thinking Questions** in boxes in the margins. They are designed for students to stop and consider the information they are reading in a different light. Many involve relating the information presented in the text to the students’ own experiences. Others encourage the students to design a study that challenges the findings in the text or come up with an alternate explanation. Some students wait and use the Critical Thinking Questions as a review after they complete the chapter.

Key terms are set in boldface type and defined immediately in the text. This is how I learned best as a student, and my students agree. (I poll them about various features of this textbook every time I teach this class.) The vast majority do not like definitions in boxes in the margins. I believe we learn best by seeing a term in context. Definitions are offered in the Glossary.

Ancillaries

No book is complete without an instructor support package. *The Journey of Adulthood* is accompanied by the following ancillaries.

- **Instructor’s Manual and Test Bank.** The Instructor’s Resource Manual and Test Bank have been thoroughly revised for the eighth edition. The Instructor’s Manual includes resources such as discussion topics and suggestions for additional reading. The Test Bank contains over 50 questions per chapter, including multiple-choice, true/false, short answer, and essay questions. The Test Bank is accompanied by a Total Assessment Guide for each chapter that divides questions by topic into factual, conceptual, or applied categories. The Instructor’s Manual and Test Bank are available for download via the Pearson Instructor’s Resource Center (www.pearsonglobaleditions.com/Bjorklund).
- **PowerPoint Lecture Slides** The lecture slides have been wholly reworked and completely revised by Julie McIntyre, Associate Professor of Psychology, Russell Sage College, and feature prominent figures and tables from the text. The PowerPoint Lecture Slides are available for download via the Pearson Instructor’s Resource Center (www.pearsonglobaleditions.com/Bjorklund).

- **CourseSmart*** CourseSmart Textbooks Online is an exciting choice for students looking to save money. As an alternative to purchasing the print textbook, students can subscribe to the same content online and save up to 60% off the suggested list price of the print text.

With a CourseSmart eTextbook, students can search the text, make notes online, print out reading assignments that incorporate lecture notes, and bookmark important passages for later review.

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*Barbara R. Bjorklund
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Chapter 1



An Overview of Adult Development

MY JOURNEY OF adulthood began early, as did that of many women of my generation, when I married shortly after high school and began a family. But unlike many women in my peer group, I spent more time reading than I did having morning coffee with the other moms. I always took a book along to read while the kids had music lessons, baseball practice, and orthodontist appointments. The library was a weekly stop along with the grocery store and was as important to me. By the time my youngest child began kindergarten, I enrolled in college as a freshman—at the age of 29, which was much older than the average at that time. For the next 7 years, my children and I did our homework together at the kitchen table, counted the days to the next holiday break, and posted our grade reports on the refrigerator. Today, as adults, they tell me that they can't remember a time in their childhood when I wasn't in school. Just before I received my master's degree in developmental psychology, the marriage ended, and I spent some time as a single mother. I abandoned plans for a PhD and took a job at the university, teaching psychology courses and doing research on children's memory development. And just as my children began to leave the nest, I married a man whose own journey of adulthood had brought him to fatherhood rather late, making me stepmother of a 5-year-old, who quickly became an important part of my life. Not too

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Summary

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much later, the grandchildren began to arrive, and life settled into a nice routine. It seemed I had done it all—marriage, parenthood, career, single parenthood, stepparenthood, and grandparenthood; my life was full.

Suddenly, my 50th birthday loomed, and it seemed to represent so much more to me than turning “just another year older.” The half-century mark was quite a shock and caused me to reevaluate my life. I realized that I wasn’t ready to ride slowly into the sunset for the next several decades; I needed to get back on track and move forward with my education. The next fall I entered a PhD program in life-span developmental psychology at the University of Georgia. It was an invigorating experience and also very humbling. Instead of being the teacher, I was the student. Instead of supervising the research project, I was the newbie. Instead of being the one giving advice, I was the one who had to ask where the bookstore was, where to park, and how to use the copy machine. But 3 years later I was awarded a red-and-black hood in a formal graduation ceremony with my children and grandchildren, parents, and siblings cheering for me from the audience.

Now I teach part time at the local university and write college textbooks. Twelve years ago my husband and I moved from our city home to a country home in southeastern Florida, complete with a cypress stand in the front yard and a small pine forest in the back. Our neighbors have horses, and we wake to roosters crowing in the morning. Two of our younger grandchildren live nearby, and my typical day consists of teaching a university class in the morning and then picking up my 15-year-old grandson at high school so he can drive me around town on whatever errands I might have. He just got his learner’s permit, and I am enjoying that magical year when he seemingly wants to go everywhere with me. Last week I helped my 10-year-old grandson with his fifth-grade science project—growing flowers with and without magnesium sulfate to see which have the brightest blooms. It was fun, but I was a little irked when “we” only got a B+.

Three years ago, with three adult children and eight grandchildren ranging in age from 7 to 25, my husband and I felt that our lives were settling down a little. But then my older son, who had been divorced for many years (and had four children in college), remarried and surprised us with Miss Lily Pearl—Grandchild #9! She just had her first birthday last week, and we can’t imagine how we ever thought our family was complete without her. So if there is a message to take from this book it is this: development doesn’t stop at 21—or 40 or 65. Your life will never stop surprising you until you breathe your last breath. My wish for you is that the surprises are mostly happy ones.

Basic Concepts in Adult Development

This book is about adult development, and it follows the tenets of **developmental psychology**, the field of study that deals with the behavior, thoughts, and emotions of individuals as they go through various parts of the life span. The field also includes child development, adolescent development, and **adult development**, which is the particular concern of this book. We are interested in the changes that take place within individuals as they progress from emerging adulthood (when adolescence is ending) to the end of life. Although many autobiographies give first-person accounts of people’s lives and many interesting stories about people’s experiences in adulthood, this book is based on **empirical research**—scientific studies of observable events that are measured and evaluated objectively. When personal accounts and examples are used (including the opening story about my life), they are chosen to illustrate concepts that have been carefully researched.

Some of you reading this are just beginning the journey of your own adult life; some of you are partway along the road, having traveled through your 20s, 30s, and perhaps 40s, 50s, and beyond. Whatever your age, you are traveling, moving through the years

and through the transformations that come along the way. We do not all follow the same itinerary on this journey; you may spend a long time in a location that I do not visit at all; I may make an unscheduled side trip. Or we may visit the same places but experience them very differently. Every journey has **individual differences**, aspects that are unique to the individual. You may not have experienced the trials of single parenthood as I have or the joys of grandparenthood, and I cannot relate to the independence you must feel when living alone or the confusion you experience when your parents divorce. Likewise, there also have to be some **commonalities**, typical aspects of adult life that most of us can relate to (either now or in the future). Most of us have moved out of our parents' homes (or plan to soon), experienced romantic relationships, entered college with some plans for the future, and either started a family or given some serious thought to parenthood. Without these common hopes and experiences, there would be no reason for a book on adult development. My goal for this book is to explore with you both the uniqueness and the common grounds of our adult lives.

Two of the concepts featured in this book are stability and change during the developmental process. **Stability** describes the important parts of our selves that make up a consistent core. It is the constant set of attributes that makes each of us the individuals that we are throughout our lifetimes. In other words, your 40-year-old self will be similar to your 20-year-old self in some ways, as will your 60-year-old self. For example, one of the stable themes of my adult life is a love for books. In fact, it goes back to my childhood. Some of my most prized possessions are the books in my library. I always have several books sitting around the house that I am in the process of reading. And 10 years ago I started a book club in my neighborhood that has become a big source of joy for me. Another theme that keeps popping up in my life is children, beginning early on with three younger sisters, then my own children, then my stepdaughter, nieces and nephews, then grandchildren. I have always had a toy box in my living room and sippy cups in the kitchen cabinet. In fact, the two themes of books and children often mix. I send books on birthdays for the children on my gift list, and when visiting children spend the night, I have a shelf of children's books in the guestroom, some of them that belonged to their own parents so many years ago. Perhaps you find stability in your life in terms of playing a musical instrument or participating in sports. The genre of books I read may change over the years, and your choice of musical selections or sporting events may be different from time to time, but the core essence of these stable themes remains an integral part of our lives.

Change is the opposite force to stability. It is what happens to us over time that makes us different from our younger (and older) selves. An example from my life that illustrates this is travel. As a child I never traveled too far out of my home state of Florida. Almost all my relatives lived nearby, and those who didn't were more than happy to visit us in the warm climate during the winter. In fact, at the age of 35, I

CRITICAL THINKING

Which of your interests, developed sometime in your childhood, do you see yourself pursuing even after 10 years from now?



Middle adulthood can bring large-scale changes in lifestyle and interests, as illustrated by this photo of author Barbara Bjorklund along the city wall of Siena, Italy.

had never been on an airplane. But when I married my current husband (and no longer had children living at home), I had the opportunity to travel with him to national conferences and accompany him on international trips as he collaborated with colleagues and worked as a visiting professor around the world. In the last 20 years, we have spent extended periods of time in Germany, Spain, and New Zealand. We have made shorter trips to Japan, China, Italy, Sweden, Norway, Denmark, England, Scotland, Wales, Austria, Switzerland, and Egypt. Last year we made it to Paris! I am an expert packer, and my office is filled with framed photos I have taken in many exotic locations. To compare myself at 30 and 50, my travel habits would constitute a dramatic change. Other examples of change in the adult developmental process occur when one becomes a parent, switches careers, or decides to move to another part of the country (or to an entirely different country). One way to view the journey of adulthood is to consider both the stability and the change that define our lives.

Still another way of looking at this journey is gauging how straight the road is. Some stretches of our lives are **continuous**—slow and gradual, taking us in a predictable direction. My gardening certainly fits this definition. In my earliest apartments I had potted plants, and when we rented our first house, I persuaded the landlord to let me put in a small flower garden. As our yards have grown bigger, so have my garden projects. I enjoy plant fairs, trade plant cuttings with friends, and of course, read books about gardening. I find it relaxing to spend time “digging in the dirt.” I have increased my knowledge and skill over the years. Now that our yard is measured in acres instead of square feet, I’m in heaven. So far I have a butterfly garden in the front yard, and I’m working on a vegetable garden in the back. Hopefully I will continue to “develop” as a gardener for many years.

In contrast, our lives also have **stages**, parts of the journey where there seems to be no progress for some time, followed by an abrupt change. Stages are much like driving on a quiet country road for a long time and then getting onto a busy interstate highway (or vice versa). In my adult life I view the years of being home with my young children as a stage that was followed by the abrupt change of the youngest entering school and me starting college. I suddenly went from having minute-to-minute, hands-on parenting duties to the type that involve preparations the night before and then dropping the children off at school in the morning. And I also went from having mostly tasks that involved physical work and concrete thinking skills (how to get crayon marks off the walls) to those that required abstract thinking (Psychology 101). This mother/student stage continued for many years until I reached the single-mother/researcher stage. An interesting question in the study of adulthood is exploring how **typical** these stages of adult life are: Do most adults go through them along their journeys, and if so, do they go through them in the same order and at the same age? Or are they **atypical**, unique to the individual? I think that sending one’s youngest child off to school is probably a universal event in a mother’s life, signaling the end of one stage and the beginning of another, but I don’t think that the transition from full-time mother to full-time student is typical, though it is more common today than it was a generation ago.

A final theme of this book has to do with inner versus outer changes. As we proceed along the journey of adulthood, many **outer changes** are visible and apparent to those we encounter. We enter early adulthood and become more confident in our step and our carriage; we fill out and mature; some of us become pregnant; some begin to lose their hair. In middle age many of us lose and gain weight, increase and decrease in fitness. **Inner changes** are not as apparent to the casual observer. We fall in and out of love, hold our children close and then learn to give them space. We look to our parents for guidance at the beginning of our journeys and then assist them at the end of theirs. And we grow in wisdom and grace. Of course the inner and outer changes are not independent of one another. Outer changes can affect the way we feel about ourselves, and vice versa. They also affect the way others perceive us, and this, in turn, affects our self-perceptions. Untangling this conceptual ball of yarn is another goal of this book.

Sources of Change

Multiple explanations about what influences adult development are quite common, much to the dismay of students (and textbook authors). In fact, the types of influences that result in change have been classified as (a) normative age-graded influences, (b) normative history-graded influences, and (c) nonnormative life events. In the following section I will describe these various influences and give you some examples so you can see them at work in your own lives.

Normative Age-Graded Influences

When you hear the phrase “sources of change,” your first thought is probably of what we call **normative age-graded influences**, those influences that are linked to age and experienced by most adults of every generation as they grow older. At least three types of age-graded influences impinge on the typical adult.

Biology. Some of the changes we see in adults are shared by all of us because we are all members of our species undergoing natural aging processes. This is often represented by the idea of a **biological clock**, ticking away to mark the common changes that occur with time. Many such changes are easy to see, such as hair gradually turning gray or skin becoming wrinklier. Others are not visible directly from the outside but occur inwardly, such as the loss of muscle tissue, which results in a gradual loss of physical strength. The rate at which such physical changes occur varies quite a lot from one person to another, as will be explained more fully in Chapter 2.

Shared Experiences. Another normative influence that is dictated for most of us by our ages can be envisioned by a **social clock** defining the normal sequence of adult life experiences, such as the timing of marriage, college graduation, and retirement. Even though our society has expanded the choices we have in the timing of these experiences, we still are aware of the “normative” timing of these events. Where we stand in relation to the social clock can affect our own sense of self-worth. The middle-aged man still living at home, the “perpetual student,” the older working woman whose friends have retired—all may be doing well in important aspects of their lives, but if those lives are out of sync with what society expects in the way of timing, it may lead to some personal doubts. In contrast, the young adult who is CEO of his own high-tech company, the middle-aged woman who completes law school, and the octogenarian who finishes the Boston Marathon may have reason to celebrate over and above the face value of their accomplishments.

Another effect the social clock can have is **ageism**, a type of discrimination in which opinions are formed and decisions are made about others based solely on the fact that they are in a particular age group. Older adults are sometimes perceived to be cranky, sexless, forgetful, and less valuable than younger people. These stereotypes are perpetuated by television sitcoms, commercials, birthday cards, and jokes on Facebook. Emerging adults can also be targets of ageism, when they are perceived as being less capable than their older coworkers or when they are stereotyped as delinquents because of their style of clothes and speech. One of my goals for this book is to give a realistic and respectful look at adults of every age.

Another manifestation of the influence of the social clock in virtually all cultures is the pattern of experiences associated with family life. For example, the vast majority of adults experience parenthood, and once their first child is born, they begin a fixed pattern of shared social experiences with other parents that move along with their children’s stages of life—infancy, toddlerhood, the school years, adolescence, and preparation to

leave home. Each of these periods in a child's life makes a different set of demands on parents—attending childbirth classes, setting preschool playdates, hosting scout meetings, coaching Little League baseball, visiting potential colleges—and this sequence shapes 20 or 30 years of most adults' lives, regardless of their own biological ages.

Obviously, shared developmental changes based on the social clock are much less likely to be universal than those based on the biological clock. But within any given culture, shared age-graded experiences can explain some of the common threads of adult development. In Chapter 5 I will discuss some of these shared experiences in the form of roles and role transitions in adulthood.

Internal Change Processes. At a deeper level, there may be shared inner changes resulting from the way we respond to the pressures of the biological and social clocks. For example, several theorists have observed that in early adulthood, particularly after the birth of children, parents tend to exaggerate traditional masculine or feminine traits. Then at midlife, after the children are grown and no longer living in the home, many men and women seek to balance their feminine and masculine qualities. Men tend to become more emotionally expressive and warmer than they were during the parenting years, whereas women become more assertive and independent. In fact, there is some evidence that such an expansion of gender qualities occurs in many cultures, as I will describe more fully in Chapter 5. For now my point is simply that this is an example of an internal change that may be linked to the biological and social clocks, but is not caused entirely by one or the other. It is determined by the way we respond to the changes they entail.

Normative History-Graded Influences

Experiences that result from historical events or conditions, known as **normative history-graded influences**, also shape adult development. These influences are helpful for explaining both the similarities found among people within certain groups and also the dissimilarities between people in those same groups. Both are important parts of a course on adult development.

The large social environments in which development takes place are known as **cultures**, and they can vary enormously in the ways they influence the adult life pattern: the expected age of marriage or childbearing, the typical number of children (and wives), the roles of men and women, class structures, religious practices, and laws. I was reminded of this on a trip several years ago, when a young Chinese mother in Beijing struck up a conversation with me, and we began talking about our families. She had a toddler daughter with her who was 2 1/2, just the age of my youngest grandson, I told her. “*Youngest grandson?*” she asked, “How many grandchildren do you have?” I told her I had eight, then realized from her expression of surprise that this was very unusual in China. She explained to me that since 1979 there has been a one-child policy in China. Almost all Chinese parents in urban areas limit their families to one child. She was an only child; her daughter was an only child (and the only grandchild of both sets of grandparents). The typical person in her culture has no siblings, no aunts or uncles, and no cousins. She asked to see pictures of my grandchildren and wanted to know their ages and details about them. We had a very friendly visit, but I could not help but wonder how different my life would be in that culture, and what her life will be like when she is my age.

A **cohort** is a more finely grained concept than a culture because it refers to a group of people who share a common historical experience at the same stage of life. The term is roughly synonymous with generation, but narrower—a generation refers to about 20 years, whereas a cohort can be a much shorter period. And a generation can refer to a much larger geographic area, whereas a cohort can be just one country or one region of



The terrorist attack of September 11, 2001, is surely a defining event for the cohorts who experienced it.

one country. For example, Cuban Americans who came to the United States in the 1960s to flee Fidel Castro make up an important cohort in south Florida.

One of the most studied cohorts in the social sciences is the group of people who grew up during the Great Depression of the 1930s. This was a time in the United States (and in most of the world) that crops failed, factories closed, the stock market crashed, unemployment skyrocketed, and without unemployment benefits and government social programs, the only help available was from family, neighbors, or churches (none of whom had much to share). Almost no one escaped the effects of this disaster. But what were its effects, and were people affected differently depending on what age they were when the Great Depression hit? That was the thrust of the research on growing up in the Great Depression done by sociologist Glen H. Elder, Jr. (1979). He found that the cohort of people who were teenagers in the depths of the Great Depression showed fewer long-term effects than those who had been in early elementary school at the same time. The younger cohort spent a greater portion of their childhood under conditions of economic hardship. The hardship altered family interaction patterns, educational opportunities, and even the personalities of the children, so that the negative effects could still be detected in adulthood. Those who were teenagers during the Great Depression did not show negative effects in adult life; on the contrary, some of them seemed to have grown from the experience of hardship and showed more independence and initiative in adulthood as a result. Thus two cohorts, rather close in actual age, experienced the same historical event

differently because of their ages. The timing of events interacts with tasks, issues, and age norms, producing unique patterns of influence for each cohort and helping to create common adult-life trajectories for those in the same cohort.

Although the era of the Great Depression is past, this research should remind us that every one of us, as an adult, bears the marks of the events we have lived through and the age-specific ways we reacted to those events. Do you remember the death of Princess Diana? Hurricane Katrina? Certainly all adults today remember the terrorist attacks of September 11. They all had effects on us, and a different effect depending on our ages. Less-dramatic happenings also have an influence on different cohorts, such as the economic conditions of the times, the political and religious climate, the educational system, and the popular culture. As many of these influences as possible need to be considered when researchers are comparing people of different ages to find age effects in some characteristic or ability. Table 1.1 shows some of the salient events that occurred

CRITICAL THINKING

Which decade of events in Table 1.1 is the most salient to you? Ask this of people who are younger or older than you. Is there some pattern here?

in the recent past and the ages of seven different cohorts when these events happened. Find the decade of your birth in the row of dates across the top of the table and then review what age you were when various events happened. If you compare your own cohort with that of your parents (or your children), you will see that the sequence of history may have had different effects on members of the same family.

Nonnormative Life Events

Along with the aspects of yourself that you share with most other adults your age and in your culture, there are **nonnormative life events**, aspects that influence your life that are unique to you, not shared with many others. These can have an important effect on the pathway of your life. Examples of nonnormative life events are having one's spouse die in early adulthood, inheriting enough money to retire at age 40, taking over parental responsibility for one's grandchildren, and starting one's own business at 65.

Some of these events are nonnormative for anyone at any age, such as inheriting a large amount of money, but others are nonnormative because of the timing. The death of a spouse is, unfortunately, a normative event in older adulthood, but not so in the earlier years. And starting one's own business may be remarkable in early adulthood, but it is highly nonnormative at the age of 65. As pioneering developmental psychologist Bernice Neugarten advised us back in 1976, we have to pay attention not only to the event itself, but also to the timing. Events that are on time are much easier to cope with (even the death of a spouse) than those that are off time.

I can speak from experience as one who was off time in several aspects of my life—becoming a parent early, going to college late, becoming a grandparent early, going to graduate school late. It makes for a good opening chapter of a textbook, but it was not always easy. One problem is the lack of peers—I was always “the older one” or “the younger one,” never just one of the group. You don't fit in with your age-mates because you are doing something different, but you don't fit in with your fellow students or soccer moms either because you are not their age. And if this situation is easy to deal with yourself, sometimes others have problems, such as administrators who don't want to hire beginning professors who are older than they are. So in the best of all possible worlds, it is probably easier to do things “on time” than march to your own drummer—I've just never lived in the best of all possible worlds.

Sources of Stability

In my discussion so far, I have focused on explanations of change. However, some traits and behaviors show patterns of stability, having little or no change for significant

Table 1.1 Selected Events from 1980 to 2013 and the Ages at Which They Were Experienced by Seven Cohorts

Year	Event	1940 Cohort	1950 Cohort	1960 Cohort	1970 Cohort	1980 Cohort	1990 Cohort	2000 Cohort
1980		Age: 40s	Age: 30s	Age: 20s	Age: Teens	Age: Children	Age: Not born yet	Age: Not born yet
1981	Ronald Reagan becomes president of the U.S.							
1981	Prince Charles and Diana (Princess of Wales) marry							
1981	AIDS identified							
1983	Sally Ride becomes first woman in space							
1989	Berlin Wall falls							
1989	Students massacred in China's Tiananmen Square							
1989	George H. W. Bush becomes president of the U.S.							
1990		Age: 50s	Age: 40s	Age: 30s	Age: 20s	Age: Teens	Age: Children	Age: Not born yet
1991	Collapse of USSR							
1991	Operation Desert Storm begins							
1993	Bill Clinton becomes president of the U.S.							
1994	O. J. Simpson arrested for murder							
1994	Kurt Cobain commits suicide							
1995	Oklahoma City bombing							
1997	Death of Princess Diana							
1999	Columbine High School massacre							
2000		Age: 60s	Age: 50s	Age: 40s	Age: 30s	Age: 20s	Age: Teens	Age: Children
2001	George W. Bush becomes president of the U.S.							
2001	World Trade Center/Pentagon attacked by terrorists							
2003	Iraqi War begins							
2003	Saddam Hussein captured by U.S. forces in Tikrit							
2004	Tsunami kills 230,000 in Indonesia area							
2005	Hurricane Katrina hits New Orleans							
2009	Barack Obama becomes president of the U.S.							
2009	Michael Jackson dies							
2010		Age: 70s	Age: 60s	Age: 50s	Age: 40s	Age: 30s	Age: 20s	Age: Teens
2010	Earthquake devastates Haiti							
2011	Sen. Gabrielle Giffords is shot in Arizona							
2011	President Mubarak of Egypt resigns after Arab Spring protests							
2011	Tsunami devastates Japan							
2011	Prince William marries Kate (Duchess of Cambridge)							
2011	Osama bin Laden is killed by Navy SEALs							
2012	Sandy Hook elementary school massacre							
2012	Jerry Sandusky convicted of 45 counts of child molestation							
2012	Superstorm Sandy hits northeast U.S.							
2013	Lance Armstrong admits using illegal drugs and doping							

periods of time. To understand adult development, we must also explore and understand different types of stability. I have divided them according to the classic nature–nurture dichotomy, the biology we are born with and the environment we experience around us.

Genetics

Each of us inherits, at conception, a unique combination of genes. A very large percentage of these genes is identical from one member of the species to the next, which is why our developmental patterns are so much alike—why children all over the world walk at about 12 months, why we go through puberty in our early teens and menopause around 51. But our genetic inheritance is individual as well as collective. The study of **behavior genetics**, or the contributions genes make to individual behavior, has been a particularly active research topic in recent decades. We now know that specific heredity affects a remarkably broad range of behaviors, including cognitive abilities such as IQ, physical characteristics, such as height or body shape or a tendency to fatness or leanness, personality characteristics, and even pathological behavior, such as a tendency toward alcoholism, schizophrenia, or depression (Plomin, DeFries, Knopik, et al., 2012). The extent to which these traits and tendencies remain in place throughout our lives shows the influence of heredity on stability in development.

In searching for genetic influences on variations in adult behavior, behavior geneticists rely primarily on **twin studies**. These are studies that compare monozygotic twins with dizygotic twins on some behavior. Such studies are based on the fact that *monozygotic twins* develop from the same sperm and ovum and thus share exactly the same genetic patterning at conception, whereas *dizygotic twins* each develop from a separate sperm and ovum and are therefore no more alike, genetically, than any other pair of siblings. In typical twin studies, measurements of some trait or ability are taken on each twin, and then the pairs are compared to see how similar their scores are. If the monozygotic twin pairs are more similar for that trait or ability than the dizygotic twin pairs, then it is taken as evidence that the trait or ability is more influenced by genetics than by environmental factors.

Twin studies are difficult to do because the statistics involved require large numbers of participants, and it is difficult for a researcher to recruit hundreds of pairs of twins. For this reason, several countries that have central databanks of their citizens' birth records and health records have taken the lead in this type of research. The largest databank of twins is in Sweden at the Karolinska Institute in Stockholm. It maintains a database of information on over 85,000 twin pairs. Several studies in this book were based on data from the Swedish Twin Study database, as you will soon find out.

Environment

If our genetic makeup contributes to the parts of ourselves that remain relatively stable over time, so does our environment. Although neither our biology nor our upbringing dictates our destiny, both have long-term effects. The lifelong effect of early family experience has been clearly demonstrated by the Grant Study of Harvard Men. Psychiatrist George Vaillant (2002), the study's current director, has concluded that those who lived in the warmest, most trusting homes as children are more apt to be living well-adjusted lives in adulthood than those who spent their childhoods in the bleakest

homes. Men from the warmest homes are more able, as adults, to express emotions appropriately and openly, to see the world and the people in it as trustworthy, and to have friends with whom they enjoy leisure-time activities. Vaillant's interpretation is that parents who provide basic trust to their children (in this case, their sons), instill a sense of self-worth, good coping skills, the ability to form meaningful relationships, and in general construct a solid foundation for the core values the child will take with him or her throughout adulthood. And what's more, subsequent studies show that these data could predict which men at age 75 would most likely be aging successfully (i.e., are healthy and happy) and which would be aging unsuccessfully (i.e., are sick and sad). Taken together, Vaillant's studies show that at least for extreme situations, early childhood environment can set the course for a lifetime of either emotional openness, trust, and good health or loneliness, mistrust, and illness. This research led Vaillant to propose a major theory of personality development that will be discussed in Chapter 8.

Interactionist View

Of course there are no simple partitions between genes and environment, and we can't separate their contributions to the stability we experience throughout adulthood. Most developmentalists now subscribe to an **interactionist view** in which one's genetic traits determine how one interacts with the environment and even the environment itself (Greenberg, Halpern, Hood, et al., 2010). For example, a boy with a genetic makeup that promotes avoiding risks will grow up with a certain pattern of interactions with his parents and siblings and will seek out friends and activities that do not involve high risk. Teachers may view this as stable and sensible and steer him to a career such as accounting. The result is a young adult with risk-avoiding genes working in a low-risk career environment and enjoying low-risk activities with his friends. He will no doubt marry someone who shares these interests, giving him even more support for this lifestyle. You can imagine the life course of this person, perhaps having one child, living in the same home and working in the same job until retirement. Quiet evenings would be spent at home or at the neighborhood tavern. He would have good health because of regular checkups, exercise, and sensible eating habits. He (and his wife) would use their seatbelts and drive defensively. Vacations would be carefully planned tours of scenic places, and retirement would bring regular golf games with the same friends each week and volunteer work with the foster grandparent program at the local elementary school. Risk avoidance is the theme of this person's life, but can we really say it was caused by his genetic makeup? Or was it the environment? It's the interactionist's chicken-and-egg dilemma.

Recently, a biological mechanism has been identified for this interaction between genes and environment. **Epigenetic inheritance** is a process in which the genes one receives at conception are modified by subsequent environmental events that occur during the prenatal period and throughout the life span (Kremen & Lyons, 2011). This process by which genes are modified is known as **DNA methylation** because it involves the chemical modification of DNA through the addition of a methyl group, resulting in reduced gene expression. This type of inheritance explains how the environment can cause permanent, lifelong characteristics that were not part of the original genetic endowment at conception. For example, autopsies of adults who committed suicide show that those who had a history of childhood abuse are more apt to have modified glucocorticoid receptor

genes in their brains than both adults who committed suicide but had no history of childhood abuse and a control group of adults who died of other causes (McGowan, Sasaki, D'Alessio, et al., 2009). As you will learn in Chapter 10, glucocorticoid receptors determine how an individual responds to stress. In this case, it seems that early childhood experiences bring forth changes in the children's genetic expression that have lifelong consequences. This will also be discussed more in Chapter 3.

A Word About “Age”

Most people know that age is just a number. Perhaps ages in childhood give valid information about what to expect in the way of appearance or behavior, but once a child reaches adolescence, many more factors take over. In fact, the further we venture on the journey of adulthood, the more variability there is among people our “own” age. Several types of age have been identified, and they illustrate the many dimensions of adult development.

CRITICAL THINKING

How old are you? What would you estimate your biological age to be? Your social and psychological age? How do they match with your chronological age?

The number of years that have passed since your birth or the number of candles on your last birthday cake is your **chronological age**. As I mentioned before, this may be important in childhood, when all 7-year-olds look similar and have similar interests and abilities, but in adulthood, this number is seldom relevant, except for young adulthood when driving, purchasing alcohol, and voting are determined by chronological age and in older adulthood when eligibility for Social Security and Medicare are determined by chronological age. However, your development in adulthood does not occur because the clocks have struck a certain number of times any more than because the heat from your birthday candles reaches a certain temperature. It may be related, but chronological age does not *cause* developmental changes.

Biological age is a measure of how an adult's physical condition compares with others. “He has the memory of a 50-year-old” and “She runs like a 30-year-old” are examples of informal measures of biological age. Of course, it depends on the person's chronological age. Having the memory of a 50-year-old means one thing if the person is 70, a much different thing if 30! As you will see in Chapter 2, biological age is used to evaluate aging of the physical systems, such as with bone density scans, in which patients' bones are compared to those of a healthy 20-year-old. Biological age can often be affected by lifestyle changes, as will also be discussed in Chapter 2.

Another type of age is **psychological age**, which is a measure of how an adult's ability to deal effectively with the environment compares to others. A 30-year-old woman who can't pay her electric bill because she couldn't resist buying designer jeans and is often late for work because she oversleeps is functioning like a teenager. Her psychological age is much below her chronological age.

Social age is based on the expected roles a person takes on at a specific point in his or her life. A woman who has her first child at 40 is taking on a role that has a social age at least a decade younger. A 23-year-old who works full time, goes to school full time, and sends money home to help support her grandmother has a social age much greater than her years. Sometimes biological age, psychological age, and social age are considered in a package as **functional age**, or how well a person is functioning as an adult compared to others. But it seems clear that the question, “How old are you?” has a number of answers.

As developmental psychologists, we try not to depend solely on chronological age when investigating some aspect of adult behavior. As you will see in the following chapters, many studies use age groups (young adults compared to middle-aged groups) or roles (couples without children compared to couples with children). Often they avoid the chronological age question by comparing the same people before and after they take on a role, such as parenthood or retirement. It is important to keep in mind that development and chronological age do not travel hand in hand, and this becomes more and more apparent the older we get.

Setting the Course: Some Guiding Perspectives

Before any questions about adult development can be asked, we need to determine what platform to stand on—the base from which we set the course of this journey. The next 10 chapters in this book cover specific areas of development and include specific theories to guide that research, but two broad approaches are used for all the chapters, and they define the tone of the book.

CRITICAL THINKING

Think in what all ways you and your classmates differ from the youth of the 1940s. Choose a country other than your own. How are you different from the students of that country?

Life-Span Developmental Psychology Approach

One major approach of this text is the **life-span developmental psychology approach**, which states that development is lifelong, multidimensional, plastic, contextual, and has multiple causes (Baltes, Reese, & Lipsitt, 1980). Psychologist Paul Baltes and his colleagues introduced these ideas in 1980, and although this approach sounds very ordinary today, it defined a turning point in developmental psychology, which before that time was focused almost exclusively on child development. The major points of the life-span developmental approach are illustrated in Table 1.2, along with some examples of each, and as you read them over, you will see that this approach opened the door for the study of development at all ages—not just your 12-year-old brother, but also you, your fellow students, your parents, your professor, and even your grandparents.

Bioecological Model of Development

A second major approach this text takes is based on the **bioecological model**, which points out that we must consider the developing person within the context of multiple environments. This idea is that development must take place within biological, psychological, and, especially, social contexts that change over time, and that these various influences are in constant interaction (Lerner, 2006; Sameroff, 2009). These ideas were introduced by psychologist Urie Bronfenbrenner in 1979 and have been modified over the last three decades (Bronfenbrenner & Morris, 2006). Bronfenbrenner proposed five systems: the *microsystem*, the *exosystem*, and the *macrosystem*, as shown in Figure 1.1 with the *mesosystem* being the interaction between elements in the microsystem. In addition, there is the *chronosystem*, which reflects the fact that the other three systems are dynamic—constantly changing over time. This change can be as individual as physical maturation or as encompassing as a large-scale earthquake or an economic recession in one's country.

The major point of Bronfenbrenner's theory, and other developmental contextual approaches in general, is that individuals and their development cannot be studied

CRITICAL THINKING

In Bronfenbrenner's system, what are the specific influences on your development at each level? Does one level have more influence than the others? Do you think this is true of others or unique to you?

Table 1.2 Life-Span Developmental Psychology: Concepts, Propositions, and Examples

Concept	Proposition	Example
Life-span development	Human development is a lifelong process. No single age is more important than another. At every age, various developmental processes are at work. Not all developmental processes are present at birth.	A 38-year-old single woman makes plans to adopt a child; a 52-year-old bookkeeper becomes less satisfied with her job now that her kids are grown and she has more attention to give to her work; a 75-year-old Civil War buff becomes uninterested in attending re-enactments and begins taking a class in memoir writing. They are all experiencing development.
Multidirectionality	We develop in different directions and at different rates. Developmental processes increase and decrease. At one time of life, we can change in some areas and remain stable in others.	Some intellectual abilities increase with age, and some decline. Young adults show independence when they complete college and start a career, but show dependence at the same time when they remain in their parents' home.
Development as gain and loss	Development is a combination of gains and losses at every age, and we need to learn how to anticipate and adapt to both.	Middle-aged adults may lose their parents, but gain a new feeling of maturity. Young adults add a baby to their family, but may lose some equality in their marriage. Workers start losing speed and precision as they age, but they gain expertise.
Plasticity	Many aspects of development can be modified. Not much is set in stone, but there are limits.	Young people who enter adulthood with behavior problems or substance-abuse problems can overcome them and become responsible, successful adults. Couples with a lot of conflict in their marriages during the child-rearing years can be happy once the children are grown. Fathers can stay home with kids and be nurturing and attentive while mothers work outside the home. Older parents can change their values as a result of their young adult children's lifestyles.
Historical embeddedness	Development is influenced by historical and cultural conditions.	People who grew up in the 1970s have more open attitudes toward legalizing drugs than earlier or later cohorts. Those who lived through the Great Depression have different attitudes toward work than members of other cohorts.
Contextualism	Development depends on the interaction of normative age-graded, normative history-graded, and nonnormative influences.	Each of us is an individual because of the interaction of influences we share with other adults in general, those we share because of the times we live in, and those that are unique to us
Multidisciplinary	The study of human development across the life span does not belong to psychology alone. It is the territory of many other disciplines, and we can benefit from the contributions of all.	Contributions to the study of development come from the field of psychology, but also from sociology, anthropology, economics, public health, social work, nursing, epidemiology, education, and other disciplines. Each brings a different and valuable point of view.

Source: Adapted from Baltes (1987).

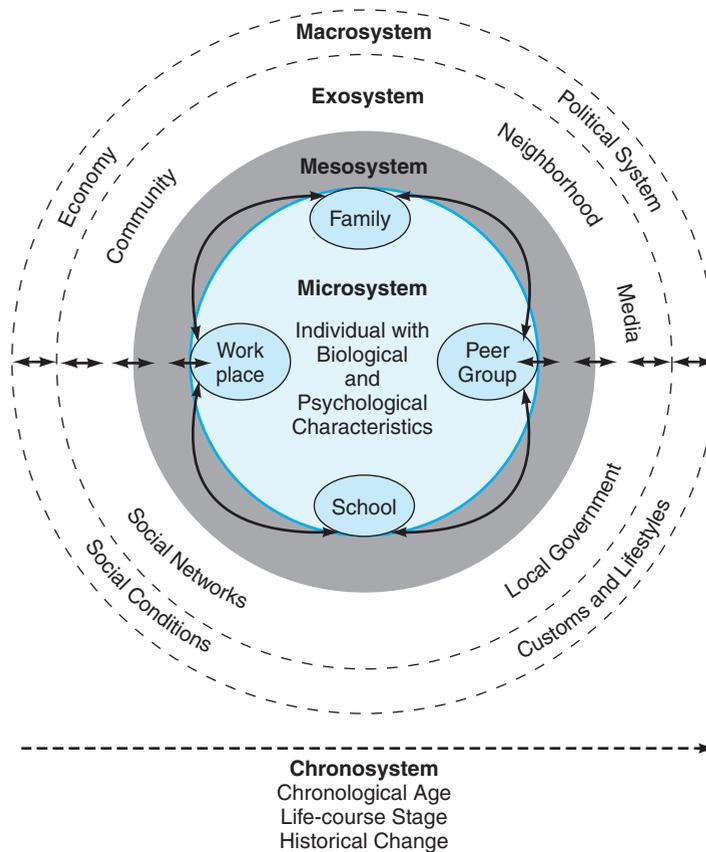


Figure 1.1 Bronfenbrenner's model of the ecological-systems approach to studying development. He suggested that researchers look beyond behavior in laboratory settings and consider how development takes place within multiple environments and through time.

Source: Based on Bronfenbrenner (1979).

“out of context.” Rather, we must consider the social environment, from family and friends through community and the broader culture—all in interaction—when trying to explain the factors that influence the course of a person’s journey to and through adulthood.

As you will see throughout this text, recent research in most areas of the social sciences has reflected this model, investigating the development of adults in the context of their lives as individuals, as partners in relationships, as parents in families, as workers on job sites, and as members of particular cultural groups and cohorts.

Developmental Research

To understand adult development, it is important to know a little about the research process because information today in the social sciences is, for the most part, science based. I won’t attempt to present a whole course on research methods and statistics, but I will cover some of the methods that are used in the studies I describe in the upcoming chapters of this text.

All research begins with questions. Suppose, for example, that I want to know something about change or stability in personal relationships over the adult years—relationships with a spouse, with other family members, or with friends. Or suppose that I wanted to study memory over adulthood. Older adults frequently complain that they can’t remember things as well as when they were younger. Is this a valid perception? Is there really a loss in

memory ability in old age, or earlier? How would I go about designing research to answer such questions? In every instance, there is a set of decisions:

- Should I study groups of people of different ages, or should I study the same group of people over time, or some combination of the two? This is a question dealing with basic research *methods*.
- How will I measure the behavior, thought, or emotion I am studying? How can I best inquire about the quality of marriage—with a questionnaire or in an interview? How do I measure depression—is there a set of questions I can use? These are questions of research *measures*.
- What will I do with the data? Is it enough merely to compare the average number of friends, or the average relationship satisfaction described by subjects in each age group? What else would I want to do to tease out some of the possible explanations? These are questions of research *analysis*.
- What do the results mean? Depending on the research method, measures, and analysis, what is the overall conclusion? What is the answer to the research question I began with? These are questions of research *design*.

Methods

Choosing a research method is perhaps the most crucial decision the researcher makes. This is true in any area of science, but there are special considerations when the topic of study is development. There are essentially three choices: (a) You can choose different groups of subjects at each of a series of ages and compare their responses—in other words, the cross-sectional method; (b) you can study the same subjects over a period of time, observing whether their responses remain the same or change in systematic ways—the longitudinal method; or (c) you can combine the two in any of several ways, collectively called sequential methods.



Development encompasses both gains and losses. Sometimes a health crisis (loss) can result in a healthy new lifestyle (gain).

A **cross-sectional study** in developmental psychology describes a study that is based on data gathered at one time from groups of participants who represent different age groups. Each subject is measured or tested only once, and the results give us information about differences between the groups.

Here is an example of a study using the cross-sectional method. Public health researcher Paul Cleary and his colleagues were interested in knowing whether there were any differences in personal health practices for adults of different ages (Cleary, Zaborski, & Ayanian, 2004). The researchers were part of a large-scale project known as the Midlife in the United States (MIDUS) National Survey, so they included questions pertaining to personal health in the surveys sent out to 7,000 participants between the ages of 25 and 74. One of the questions was, “How much effort do you devote to your personal health?” Answers were given as scores on a 10-point scale, with 1 being “very little effort” and 10 being “very much effort.” When the results were compiled, the researchers divided them into five groups according to the age of the participants and then by gender, resulting in 10 data points, each giving the average score for one gender at one age group. Figure 1.2 shows the results displayed on a graph. As you can see, the average responses to the question, “How much time do you devote to your personal health?” were between 6.8 and 7.8 points. The most obvious result (to me) was that women in every age group responded that they devoted more effort to their health than men, with the biggest difference being in the two groups of people 35 to 44 and 45 to 54 years of age. Men and women were the most similar in the older years of 65 to 74. Women’s health efforts increased steadily across the adult years, whereas men’s actually declined slightly at 35 to 44 years and then began a sharp increase. Just considering age in general, the figure shows us that the older we get, the more effort we spend on our health. Of course, there are many more findings in the MIDUS study, and I will be discussing them in more detail in later chapters, but for now, this gives you a good example of a cross-sectional research study.

Some cross-sectional studies do not use age groups. Instead they use stages in life, such as comparing young couples without children to couples who have already had their first child to see the effects of parenthood on a marriage. Or comparing young people entering college with those who are graduating to see the effects of education on political views. But all cross-sectional studies are designed to test different people at the same point in

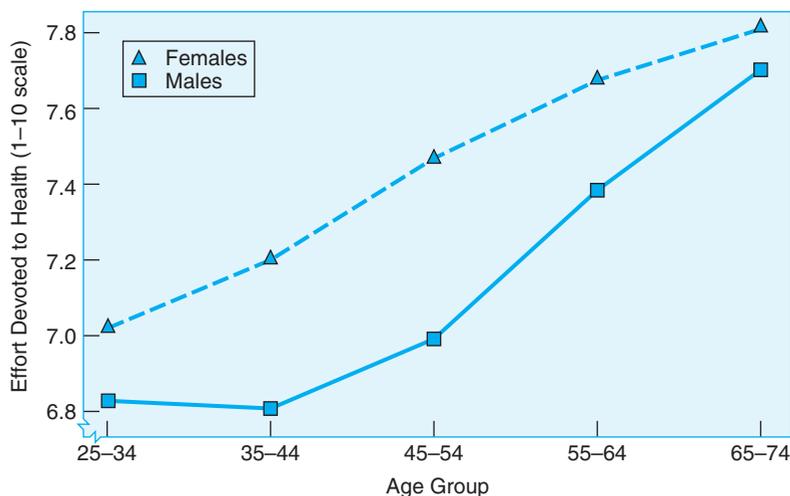


Figure 1.2 Cross-sectional data showing that the amount of effort spent on personal health care increases with age and is greater for women than for men at every age.

Source: Cleary, Zaborski, & Ayanian (2004).

time—kind of a shortcut for following those people throughout that time period and charting individual changes. The benefit is that it is quicker, easier, and less expensive than following the same people around the whole time. The downside is that it only shows *age differences*, not change. When cross-sectional studies are done with older adults, it is possible that the people in the older groups do not represent the general population as well as those in the younger groups, due to transportation problems, chronic health concerns, and difficulty in recruiting older participants. It is also the case that older participants are those who have survived into old age and may be healthier and wealthier (and perhaps wiser). But again, the minimal time and effort it takes to conduct cross-sectional studies makes them attractive to most researchers, and many of these problems can be predicted and controlled for.

A **longitudinal study**, by contrast, is one in which a researcher follows the same group of people over a period of time, taking measurements of some behavior of interest at regular intervals. In comparison to the cross-sectional study discussed earlier, a longitudinal study might start with a group of people who are 35 to 44, asking how much effort they devote to their health. Then, 10 years later, the researchers could find the same people, now at the ages of 45 to 54, and ask them the same question again. Finally, another 10 years later, the last data could be gathered when the participants are 55 to 64 years of age. Then comparisons could be made, telling the story of these individuals, at least in regard to *age-related changes* in the time they devoted to their health over their middle years (not just *age-related differences* as are revealed by correlational studies).

An example of a study using the longitudinal method is one done by psychologist Nancy Galambos and her colleagues, who were interested in the development of self-esteem in young adults (Galambos, Barker, & Krahn, 2006). They began the study at the end of the school year in 1984 by giving out questionnaires to 983 high school seniors in a large western Canadian city. Among other things, the questionnaire contained six items from a self-esteem inventory in which participants read such statements as, “On the whole I am satisfied with myself” and “I feel that I have a number of good qualities.” They rated each item on a scale of 1 (strongly disagree) to 5 (strongly agree). As Figure 1.3 shows, a year later, when the participants were 19, they received a second questionnaire containing the same questions (and others). Of the 983 original participants, 665 returned the second questionnaire. The third year the process was repeated, and 547 participants, who were now 20 years of age, returned the third questionnaire. Two years later, the researchers sent out a fourth questionnaire and received 503 in return. Finally, in 1992, when the participants were 25 years of age, the final questionnaire was sent out, and the return was 404. Although this return was only 45% of the original sample size, the response rate is typical of longitudinal studies.

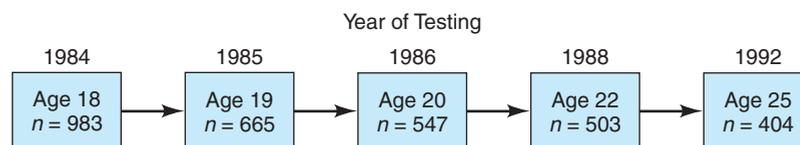


Figure 1.3 Model of a longitudinal study in which 983 students were surveyed in 1984 and then again in 1985, 1986, 1988, and 1992. Note their ages and also the number of students who returned the questionnaires (*n*).

Source: Data from Galambos, Barker, & Krahn (2006).

Galambos and her colleagues compiled the data on self-esteem by finding average scores for the group of participants at each age they were surveyed. They also divided the group into male and female subgroups. The results are shown in Figure 1.4. As the graph shows, the average scores for these young adults range between 3.75 and 4.05, and self-esteem for both groups increased between the ages of 18 and 25. There is also a different rate of increase for the males and the females. The males had higher self-esteem at 18, but by 25, their rate was not much higher than that of the females. The females had lower scores at 18, but their rate of increase was greater than that of the males.

The longitudinal method used by Galambos and her colleagues truly demonstrates *change* because the same participants were tested at each age. There were only 404 participants (compared to over 7,000 in the cross-sectional study described earlier), but the data points on the graph show increases in self-esteem for the same participants over the course of 7 years. Another plus for longitudinal studies is that the participants are from the same cohort, which increases the probability that the changes in self-esteem are age related and not the result of some normative history-graded influence on that cohort. However, the minuses of longitudinal studies should be apparent. From the first wave of testing to the published article, the study took 22 years! This method is time consuming and expensive. In a profession that bases promotion and tenure on annual publication lists, researchers need to balance longitudinal studies with shorter-term work to not “perish” due to lack of publications. The most ambitious longitudinal studies I am aware of are done in large European research institutes. For example, in the Berlin Study of Aging, there are 40 researchers on the staff and hundreds of students and paid researchers. The study began in 1990 by assessing 516 people between 70 and 100 years of age, and it took 14 sessions for each person to receive the initial assessment—a project that took the research staff 3 years (Baltes & Mayer, 1999). In the next three decades, surviving participants were assessed eight more times. Some of the participants outlived the principle investigator, psychologist

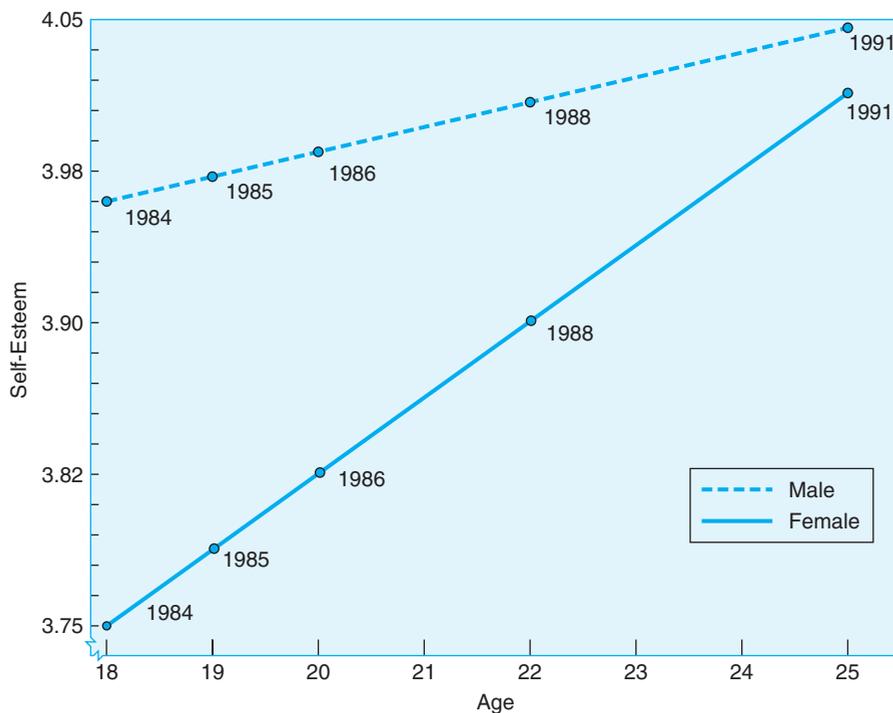


Figure 1.4 Young adults increase in self-esteem between the ages of 18 and 25, according to this longitudinal study. Note the different rates of increase for males and females.

Source: Galambos, Barker, & Krahn (2006).

Paul Baltes, who died at the age of 67 in 2006. The findings from the Berlin Study of Aging and similar research efforts will be discussed in the upcoming chapters of this book.

Another drawback to longitudinal studies is **attrition**, or participant dropout. The Galambos study began with a fairly general sample of high school students, but as the years went by, each wave of data collection yielded fewer and fewer returns. More than half of the original participants were absent from the last wave of the study. When attrition is present, we need to ask whether those who dropped out might have made a difference in the results. The researchers mentioned this in the discussion section of their journal article. They said that the self-esteem scores of those who dropped out and those who remained in the study did not differ in the earlier parts of the survey in which all participated. However, there were some other differences. Those who remained in the study were more apt to be from families with higher socioeconomic levels and more apt to continue to live with their parents in the years following graduation. The researchers caution us that the results of the study may not apply to young adults who do not fit this profile (Galambos, Barker, & Krahn, 2006).

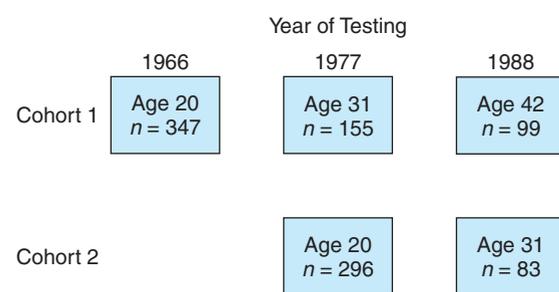
One of the ways to combine the positive aspects of the cross-sectional design with those of the longitudinal design is to use the **sequential study**, which is a series of longitudinal studies begun at different points in time. In the simplest form, one longitudinal study (Cohort 1) is begun with participants who are in one age group. Several years later, a second longitudinal study (Cohort 2) is begun with participants who are the same age as the Cohort 1 participants were when the study began. As the two studies progress, they yield two sets of longitudinal data, but they also give cross-sectional data.

For example, a sequential study was conducted by psychologist Susan Krauss Whitbourne and her colleagues (Whitbourne, Zuschlag, Elliot, et al., 1992) to answer the question of whether young adults' personalities change or remain stable as they moved into middle age. The study began in 1966 with a group of 347 undergraduate students at the University of Rochester whose average age was 20. They were given a personality inventory questionnaire asking them, among other things, to rate statements about their industry (or work ethic) according to how well each described them. In Figure 1.5, this group is shown in the top left box labeled Cohort 1, 1966. In 1977, this group was on average 31 years old, and the researchers sent out questionnaires again, receiving 155 in return, as shown in the box labeled Cohort 1, 1977. Also in 1977 a new group of 20-year-old students from the University of Rochester were given the personality inventory questionnaire (Cohort 2, 1977). In 1988 the process was repeated for the participants in Cohort 1, who were now 42 years of age, and Cohort 2, who were now 31 years of age. As you can see, 99 of the original 347 in Cohort 1 returned questionnaires, and 83 of the original 296 in Cohort 2 returned questionnaires.

At this point, there are two longitudinal studies going on, Cohort 1 with data available for the ages of 20, 31, and 42, and Cohort 2 with data available for the ages of 20 and 31. There is also a cross-sectional study going on, with a group of 20-year-olds, a group

of 31-year-olds, and a group of 42-year-olds. Figure 1.6 shows how Whitbourne and her colleagues analyzed the results. The top line shows the industry scores for Cohort 1 at ages 20, 31, and 42. The scores increase sharply between 20 and 31, and the increase becomes more gradual from 31 to 42. This definitely shows change in personality

Figure 1.5 Model of a sequential study in which two cohorts were followed beginning at age 20. One cohort was followed for 22 years; one for 11 years. Note ages and number of participants (*n*).



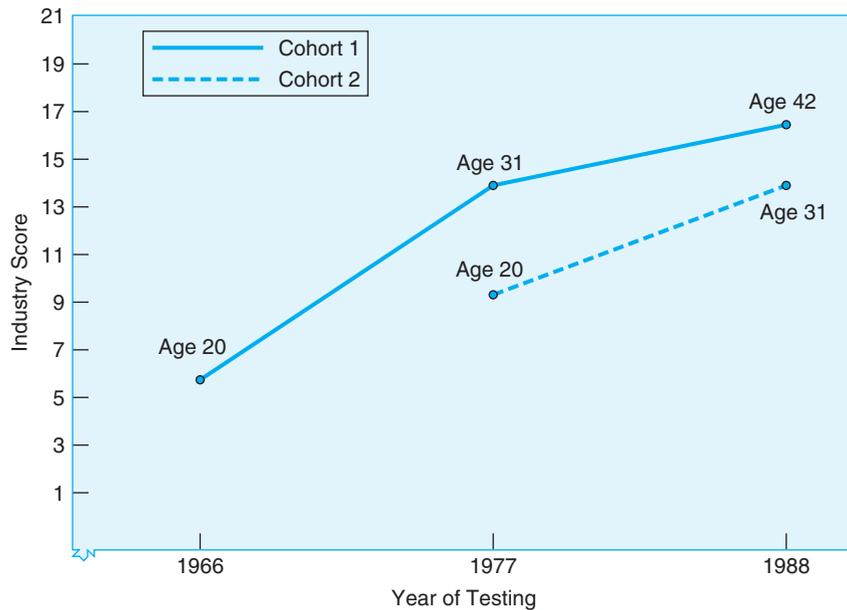


Figure 1.6 Results from a sequential study of two cohorts tested at three ages and at three different points in time. Comparing longitudinal results, Cohort 1 shows a sharper increase in industry scores between 20 and 31 years than does Cohort 2, though both have similar scores at age 31. Cross-sectional results suggest that the normative history-graded influences (Vietnam War, civil rights issues) lowered the young adults' scores in 1966.

Source: Adapted from Whitbourne, Zuschlag, Elliot, et al. (1992).

traits during adulthood, but does the same hold for other cohorts? The lower line in the figure shows the pattern for Cohort 2, tested at 20 years and 31 years of age. The pattern is different than for Cohort 1. First, the industry scores are much higher at age 20 for Cohort 2 (6.54 for Cohort 1 and 9.19 for Cohort 2), and second, the rate of increase is much slower for Cohort 2. Still, both groups had similar industry scores at the age of 31 (13.58 for Cohort 1 and 14.32 for Cohort 2). The researchers suggest that the 20-year-olds in Cohort 1 were in college during the 1960s, when the work ethic of the establishment was being questioned and rejected, and their low scores on industry were reflections of that era. Once out of school and in the workplace, this group had some catching up to do. Their catching up is represented by the sharp increase in industry scores, which at 31 are very close to the scores of Cohort 2, who were not part of the protest era. Clearly there are nonnormative history-graded influences going on here. Perhaps the normative age-graded pattern of change in the personality trait of industry is more like that of Cohort 2, but when history (the Vietnam War, civil rights issues) brings about a large student protest movement, it causes a detour in the journey of adulthood for many in that cohort, although in the case of the personality trait of industry, these college students were able to catch up to speed and be back on track by the time they were age 31. We will revisit this study in Chapter 8 when I cover personality development, but for now it serves as a good example of using the sequential method to study development.

Measures

Once the research design is determined, the next major set of decisions has to do with how to measure the behavior of interest. Each method has its own set of advantages and disadvantages, and I will discuss them here briefly.

One of the most common instruments used to gather data is a **personal interview**, that is, having the experimenter ask the participant questions, one-on-one. Personal interviews can be *structured*, like a multiple-choice test, or

CRITICAL THINKING

How would you design a questionnaire for your class to find out other students' opinions on the classroom design (the light, seating, room temperature, and so forth)?

open ended, like an essay test, or a combination of both. All the major longitudinal studies I have described so far, for example, included extensive interviews. Many cross-sectional studies of adult life also involve structured interviews. Personal interviews have the advantage of allowing the interviewer to clarify questions and ask follow-up questions. Participants feel comfortable talking to a human being and not just writing answers on an impersonal questionnaire. Drawbacks are that the participants might provide responses they feel are socially acceptable to the interviewer, and similarly, the interviewer's feelings toward the participant might cloud the recording or coding of responses, especially with very long interviews. Building rapport between interviewer and participant can be a plus or a minus.

This problem is avoided by using the **survey questionnaire**, a paper-and-pencil form consisting of structured and focused questions that participants can fill out on their own. Survey questionnaires are usually given out on a large scale, such as through the mail or at large gatherings of people. The advantages are that they can reach a large number of people in a wide geographic range. Participants may be more truthful and forthcoming about sensitive topics with a survey than if talking face-to-face with an interviewer. Survey questionnaires are much less expensive and time consuming than personal interviews. Drawbacks for mailed questionnaires are that there is a low return rate (about 30% of participants return the first questionnaire). Group-administered questionnaires have fewer lost participants, but can be affected by peer influence (especially if given out in the social environment of high school auditoriums or retirement condominium recreation rooms). Survey questionnaires are also incredibly difficult to construct.

Some of the problems of survey questionnaire construction can be avoided by using **standardized tests**. These are instruments that measure some trait or behavior and have already been established in your field of interest. Drawbacks are that many of these tests are owned by publishing companies, and you have to purchase the right to use them in your research. An example is measuring IQ using the Wechsler Scales or personality using the MMPI or the Myers-Briggs Type Indicator. However, a number of tests are also available at no charge that have been standardized and published in research articles, along with instructions for administering and scoring them. For example, researchers in a number of studies in this text measure depression in their participants with an instrument known as the CES-D-10, or the Center for Epidemiological Studies Short Depressive Symptoms Scale (Radloff, 1977). This test is easily retrieved from the Internet after a quick search and is shown in Chapter 3, Table 3.7. It is a good example of a standardized test that is easily scored and has a good record of **validity** (it measures what it claims to measure) and **reliability** (it does so consistently). How to select a standardized test for your own research? There are reference books that review tests periodically, such as the *Mental Measurements Yearbook* (Spies, Carlson, & Geisinger, 2010), but the advice I give students is to read similar studies published by other researchers and use what they use. Selecting a research measure is probably not the best time to be creative.

These are by no means the only research measures available. As you will see throughout this text, there are many ways to measure human behavior, from complex brain imaging techniques to one-item questionnaires (“How would you rate your health? Circle one of the following: Very Good, Good, Average, Poor, Very Poor”). Depending on the research question, it's important to find the most appropriate way to measure the behavior of interest.

Analyses

Once the research method has been chosen and the behavior has been measured, researchers must make another set of decisions about how to analyze the resulting data. Some of the statistical methods now being used are extremely sophisticated and complex. I'll

be describing a few of these in later chapters when I discuss specific studies that include them. At this early point, all I want to do is talk about the two most common ways of looking at adult development.

The most common and the simplest way to describe age-related differences is to collect the data (scores, measurement results) for each group, find the means (averages), and determine whether the differences in the means are large enough to be significant, a process known as **comparison of means**. With cross-sectional studies, the means of the age groups are compared. With longitudinal studies, the means of the scores for the same people at different ages are compared. With sequential studies, both comparisons are possible. However, the similarity remains—we are looking for an age-related pattern of change.

If the group of participants is large enough, it is often possible to divide it into smaller groups and look for age differences or continuities in the subgroups, such as women versus men, working class versus middle class, those with young children versus those without young children. If the same pattern appears in all subgroups, we'd be more likely to conclude that this is a significant age-related pattern. However, if the change is different for the subgroups (as is often the case), it opens the door for follow-up questions. For example, in the cross-sectional study described earlier (Cleary, Zaborski, & Ayanian, 2004), researchers divided the age groups into gender groups also, and they found that different patterns emerged for men and women in the amount of time spent on health-related activities. Not only did the researchers find answers to their questions about age-related change (yes, it increases with age), but they also found that it increased more for men, and men started out at a disadvantage. That gave the researchers the opportunity to speculate on why men seem to have so little concern about their health at 25 and do not change in this respect until about 45. In contrast, women have more concern at 24, and they increase in concern their whole lives. Perhaps at 25, women are concerned with childbearing and visit their doctors more often. Perhaps the cultural emphasis on women's appearance causes them to notice subtle signs of aging sooner, whereas men "coast" for awhile until the signs are more evident. These questions make for good discussion and inspire new research to find answers.

Comparisons of means for different age groups, either cross-sectionally or longitudinally, can give us some insights into possible age changes or developmental patterns, but they cannot tell us whether there has been stability or change within individuals. For this information, a different type of analysis is required: a **correlational analysis**. A correlation is simply a statistic that tells us the extent to which two sets of scores on the same people tend to vary together. Correlations (r) can range from +1.00 to -1.00. A positive correlation shows that high scores on the two dimensions occur together. A negative correlation tells us that high scores on one dimension occur with low scores on the other. The closer the correlation is to 1.00 (positive or negative), the stronger the relationship. A correlation of 0.00 indicates no relationship.

For example, height and weight are positively correlated: taller people generally weigh more, shorter people less. But the correlation is not perfect (not +1.00) because there are some short, heavy people, and some tall, light people. If you are on a diet, the number of pounds you lose is negatively correlated with the number of calories you eat: high calories go with low weight loss. But this correlation, too, is not a perfect -1.00 (as any of you who have dieted know full well!).

Correlations are also used to reveal patterns of stability or change. For example, researchers interested in personality traits might give personality assessments to participants over a number of years and then correlate the early scores with the later scores for each person. A high positive correlation would show stability for that trait.

CRITICAL THINKING

In your opinion, what kind of correlational pattern will emerge if we conduct a study on people who eat lots of fruits and green vegetables and their health? And what about those who meditate and their scores in the test of attention?

Ultimately, however, correlations can tell us only about relationships; they cannot tell us about causality, even though it is often very tempting to make the conceptual leap from a correlation to a cause. Some cases are easy. If I told you that there was a negative correlation between the per capita incidence of television sets in the countries of the world and the infant mortality rates in those countries, you would not be tempted to conclude that the presence of TV *causes* lower infant mortality. You'd look for other kinds of societal characteristics that might explain the link between the two facts such as income level. But if I tell you there is a correlation between the amount of time adults spend with friends and family and the overall life satisfaction those adults report, you would be much more tempted to jump to the conclusion that greater happiness is *caused* by contact with friends and family. And it may be. But the correlation, by itself, doesn't tell us that; it only tells us that there is a relationship. It remains for further research and theorizing to uncover the causal links, if any. Perhaps the greater life satisfaction people have, the more time their friends and family want to spend with them.

One unique way correlational analyses are used in developmental research is to determine the genetic contributions to various behaviors and abilities. I introduced twin studies in an earlier section and will just explain them in a little more detail here. The typical twin study involves comparing two types of twins, monozygotic and dizygotic, on the behavior you are interested in. For a simple example, let's use height (and twins of the same sex to rule out sex differences). Each twin would be measured and the height recorded.

CRITICAL THINKING

If adopted children are more similar to their adoptive parents on some measure than to their biological parents, what conclusions could you make from that?

Then two correlations would be computed comparing the twins—one for monozygotic twins and one for dizygotic twins. Which do you think would be more similar in height? Of course the monozygotic twins because they have the same genes, and height is something that is determined by inheritance to a great extent. But what about other characteristics, like IQ, the tendency toward alcoholism, how religious one is? Those are all characteristics that have been shown to be influenced by heredity to a significant extent. And the research that revealed this involved correlational analyses.

For example, in a study using data from the Swedish Twin Registry, epidemiologist Erica Spotts and her colleagues (Spotts, Neiderhiser, Towers, et al., 2004) investigated whether marital happiness is influenced by heredity. They gave a test of marital happiness to over 300 pairs of twins (all women) and their husbands. About half of the women were monozygotic twins and half were dizygotic twins. When the scores were analyzed, the monozygotic twin pairs were more alike than the dizygotic twin pairs. As you can see in Figure 1.7, if one monozygotic twin wife was happy in her marriage, the other twin tended to be happy too—and if one was unhappy, there was a good chance that the other was too. Their marital happiness scores were positively correlated. This was not the case for the dizygotic twin wives, whose correlations were about half what the monozygotic twins' correlations were. Comparing the two types of twins' correlations shows the extent of the genetic contribution to marital happiness because the monozygotic twins share the same genes, whereas the dizygotic twins share only half, and as in the case of height, we would not expect them to be as similar.

CRITICAL THINKING

What are some specific ways women can pass on their level of marital happiness to their husbands? What about marital unhappiness?

In a surprise twist, the researchers also gave the marital happiness questionnaires to the husbands of the twins, who were not related to each other or to anyone else in the study. As you can see in the figure, the husbands of the monozygotic twins also were more similar in their marital happiness scores than the husbands of the dizygotic twins. It seems that the genetic endowment of the monozygotic twins not only gave the women similar outlooks on marriage, but that the women, in turn, influenced the marital happiness of their husbands.

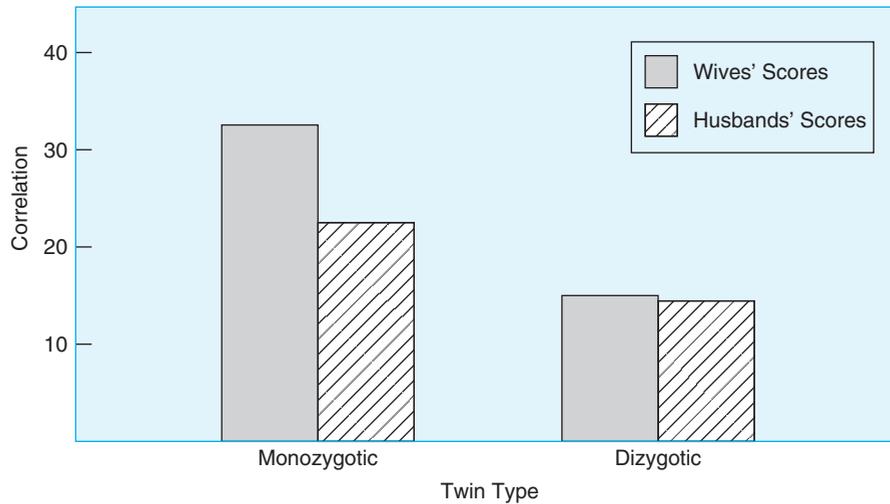


Figure 1.7 Wives who are monozygotic twin pairs are more similar in their marital happiness than wives who are dizygotic twin pairs. Interestingly, this genetic effect carried over to their husbands who were not related (compare striped columns).

Source: Data from Spotts, Neiderhiser, Towers, et al. (2004).

Another way of analyzing data is the **meta-analysis**. This approach combines data from a large number of studies that deal with the same research question. A researcher conducting a meta-analysis selects a research question, such as whether or not aerobic exercise affects cognitive functioning in older adults. This has been a topic of interest for several decades and is a prominent topic in Chapter 4 of this text. A number of studies have shown that older adults (and laboratory animals) who participate in vigorous physical activity have better cognitive abilities than their age-mates who are sedentary. However, the studies have used different age groups, different types of physical activity, and different measures of cognitive ability (not to mention different species). Psychologists Stanley Colcombe and Arthur Kramer (2003) reviewed this research and conducted a meta-analysis to evaluate the combined results. The first step was an online search to find all the studies of human cognition published in a certain time frame (2000–2001) that had any mention of age, fitness, exercise, and a number of other key words. They narrowed down the 167 articles to 18 (totaling 101 participants) that were longitudinal, supervised (not surveys), dealt with aerobic exercise, had participants assigned randomly to exercise and nonexercise groups, and had participants over the age of 55. They regrouped the data in the studies to fit one overall scheme. Participants' data were divided into three groups: 55–65, 66–70, and 71+. The cognitive tasks that were measured were divided into four types: planning, speed, control, and visuospatial. As you can see in Figure 1.8, the researchers found that the participants in the exercise groups performed significantly better on all four types of cognitive tasks than those who were in the nonexercise groups, no matter what age or gender and no matter what type of aerobic exercise was done. These are very impressive results. This meta-analysis tells us that the smaller, individual studies were all tapping into the same big pot—the idea that aerobic exercise is good for the cognitive functioning of people over 55.

Designs

The closing statement researchers are allowed to make depends on what kind of research design has been used, experimental or nonexperimental. If it is experimental, researchers are able to say their findings show that their factor of interest *caused* the change observed in their subjects. If it is not experimental research, they must limit themselves to saying that their results show a relationship or an association with the change.