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Biopsychosocial Perspectives

Sixth
Edition

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ADULT DEVELOPMENT AND AGING

Biopsychosocial Perspectives

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ADULT DEVELOPMENT & AGING

BIOPSYCHOSOCIAL PERSPECTIVES

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Sixth Edition

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PREFACE

Everyone ages. This very fact should be enough to draw you into the subject matter of this course, whether you are the student or the instructor. Yet, for many people, it is difficult to imagine the future in 50, 40, or even 10 years from now. The goal of our book is to help you imagine your future and the future of your family, your friends, and your society. We have brought together the latest scientific findings about aging with a more personal approach to encourage you to take this imaginative journey into your future.

The sixth edition of *Adult Development and Aging: Biopsychosocial Perspectives* incorporates material that we believe is vital to your understanding of this rapidly developing and fascinating field of study. Much of what you will read comes directly from Susan's classroom teaching of the Psychology of Aging course at the University of Massachusetts Amherst. She continues to incorporate her day-to-day teaching of the course into the text, which keeps the material current, fresh, and engaging. At the same time, her active involvement in research on the psychology of adult development and aging gives her the ability to sift through the available findings and pull out those that are central to an understanding of individuals as they change from the years of early adulthood through late life.

Stacey was inspired to pursue the field of aging after taking her mother's course in 1999. She continued her graduate work in social and developmental psychology, focusing on cognitive functioning in later adulthood. Stacey is the program director for a major national initiative that is building a health and genomic database for future studies of military veterans. Having also taught adult development and aging at Brandeis University and the University of Massachusetts Boston, she is also attuned to student needs and interests.

We are proud to say that the addition of Stacey as a coauthor brings a third generation into the field in a tradition begun by Theodore C. Krauss, M.D., Susan's father, an innovator in geriatric medicine. Susan became interested in the scholarly field of aging as an undergraduate when she decided to write a paper on personality and adaptation in a developmental psychology course. At the same time, her father's professional activities had a profound influence and made the choice of gerontology (the scientific study of aging) a natural one.

It is our hope and belief that you will find yourself as engrossed in the psychology of adult development and aging as we are. Not only is everyone around you aging, but also the issues that researchers in field examine range all the way from the philosophical to the practical. Why do living things age? Is there a way to slow down the aging process? How will society deal with the aging of the Baby Boomers? How will job markets be affected by an aging society? Will the young adults of today age differently than did their parents and grandparents? Bringing it to a personal level, as you take the course, you'll start to ask questions about your own life. What challenges await you as you begin your career? What will it be like to start a family? How will you manage the transition into your early adulthood as you leave college behind to pursue your own life? All of these, and more, are questions that you will find yourself asking as you explore the many complexities of the process that causes people to change and grow throughout life. You will learn not only how people grow older but also how to grow older in a way that is healthy and satisfying.

THEMES OF THE BOOK

The biopsychosocial model emphasized in our text is intended to encourage you to think about the multiple interactions among the domains of biology, psychology, and sociology. According to this model, changes in one area of life have effects on changes in other areas. The centerpiece of this model is identity, your self-definition. You interpret the experiences you have through the framework provided by your identity. In turn, your experiences stimulate you to change your self-definition.

This is an exciting time to be studying adult development and aging. The topic is gaining increasing media attention and tremendous momentum as an academic discipline within life span development. The biopsychosocial model fits within the framework of contemporary approaches taking hold in the sciences in general that emphasize the impact of social context on individuals throughout all periods of life. Entirely new concepts, sets of data, and practical applications of these models are resulting in a realization of the dreams of many of the classic developmental psychologists whose work shaped the field in the early 20th century.

Adult development and aging are areas that have no national boundaries. Aging is now being recognized as a priority for researchers and policy makers around the world, not only in the United States and Canada. We can all benefit from this international perspective both for our own countries and for those of citizens around the world.

ORGANIZATION

If you read the chapters of this book in order from start to finish, you will progress from the basics in the first three chapters to more complex issues, starting in Chapter 4, that place relatively more emphasis on the "bio," the "psycho", and the "social." However, not all instructors choose to proceed in this fashion, and we have designed the book with this flexibility as an option. We emphasize the biopsychosocial model throughout, in that many of the topics, regardless of where they appear in the book, span areas as diverse, for example, as driving and diabetes.

We do recommend, though, that the last chapter you read is not the one on death and dying, as is often the case in other books in the field. Our last chapter covers successful aging. Many students and instructors have shared with us their appreciation of our ending on a "high note." Even though death is obviously the final period of life, we each have the potential to live on after our own ending through the works we create, the legacies we leave behind, and the people whose lives we have touched. These are the themes that we would like you to take with you from this book in the years and decades ahead.

FEATURES

Up-to-Date Research

The topics and features in this text are intended to involve you in the field of aging from a scholarly and personal perspective. You will find that the most current research is presented throughout the text, with careful and detailed explanations of the studies that highlight the most important scholarly advances. We have given particular attention to new topics and approaches, including neuroscience and genetics, as well as continuing to bring to students the latest advances in cognition, personality, relationships, and vocational development as well as highlighting sociocultural influences on development, including race, ethnicity, and social class.

Information Age

As technology continues to impact the world in a variety of ways, we want to consider the effect these changes have for the older adult population. The Information Age chapter openers focus on different aspects of technology (such as online resources or social media) using real world examples to demonstrate the interaction with health and relationships. We hope you like them!

Aging Today

Susan writes a highly popular *Psychology Today* blog entitled *Fulfillment at Any Age*. Each chapter opens with a condensed version of one of the blog entries relevant to that chapter's content. These informal chapter openings will stimulate students to think about the academic material they will read in the subsequent pages, and in some cases, include practical self-help tips so popular with readers.

Engaging Figures and Tables

Each chapter is illustrated with photographs, figures, and tables intended to bring a strong visual element into the text. Many of these figures clearly summarize important research findings and theoretical models. Our selection of these materials connects to the PowerPoint slides that instructors can download from the Wiley website.

Contemporary Approach

With coauthors literally one generation apart, it's been our goal to find the balance between the "professor" and the "student" perspectives. As a result, you will find many current examples relevant to people in your age group, whether you're a returning student or a student of traditional college age. Instructors, too, will find material that they can relate to their own experiences, whether they are relative newcomers or more seasoned academics.

STUDENT LEARNING AIDS

Glossary Terms

We have made a concerted effort in this edition to provide a large number of glossary terms, indicated in bold in each chapter, and listed at the end of the book. Although it may seem like you will have a great many terms to memorize, the fact of the matter is that you will need to learn them anyway, and by having them provided in your glossary, you'll find it easier to spot them when it comes time to review for your exams. Susan finds that her students like to study from flashcards that they make up, and if you find this a useful study tool, the glossary terms will make that process much more straightforward. The majority of these terms relate specifically to adult development and aging, but where we felt it was helpful for you to review a term that you may not have encountered for a while, we also included several terms of a more general nature.

Numbered Summaries

You will find a numbered summary for each chapter that will supplement your studying and help you narrow down your reviewing to the chapter's main points. Together with the glossary terms, these will give you a comprehensive overview, though they will help you the most if you actually read the chapters themselves.

CHANGES IN THE SIXTH EDITION

The first edition of *Adult Development and Aging: Biopsychosocial Perspectives* was intended to provide a fresh and engaging approach to the field of the psychology of adult development and aging by focusing on three themes: a multidisciplinary approach, positive images of aging, and the newest and most relevant research. We continue this tradition in the sixth edition because we want you, our readers, to feel as connected to the material as possible. Our thinking is that students will be more motivated to complete their reading if they like the text and feel that they can relate to it. At the same time, instructors will find their job that much easier because students sitting in their classrooms will come to class ready to discuss what they've read.

Instructors who have developed their course based on earlier editions will not need to change the basic structure of their lectures and assignments. However, to reflect this ever-changing field, we shifted material within the chapters, in some cases deleting topics that by now are no longer considered relevant in order to make room to cover the newer approaches that have come into prominence within the past 3 years.

Although many of the classics remain, we have included nearly 300 references from the past 3 years, up through early 2016. In virtually all cases where we reference population data, we rely on sources from 2015 and 2016. We also give expanded coverage to global population and health data in keeping with our stated goal of providing an international perspective.

Those of you familiar with the previous edition will find that the figures and tables have almost all been revamped to give the text a more contemporary appearance. Additionally, we have created new figures and tables to provide pedagogically valuable additions to the text. These are based on Susan's classroom teaching of the material and feedback from her own students about how best to present important concepts to have the greatest visual impact.

In the 5th Edition, we revamped much of the topical organization to be consistent with new developments in theory and research. In the present edition, we have trimmed some areas that had become outdated even further in order to be able to cover the emerging literature. For example, in the area of personality, we added new research on behavioral health and reframed, correspondingly, the literature on ego development.

In the area of relationships, we have taken advantage of the increased attention to same-sex couples and families and therefore provided greater detail both on the demographics and dynamics of these family situations. We have also expanded treatment of grandparenthood again, consistent with new research on the topic.

Increasing attention is being paid in the occupational literature to the gender gap and the factors that contribute to economic inequity. We also expand upon newer areas of research, including the concept of the vocation as a "calling." In this chapter, also, we present new data and ideas relevant to age discrimination in the workplace and to new findings in the area of retirement.

These are a few examples of specific changes made within the chapters, but the reader familiar with the previous edition will find that we have incorporated many updates throughout the text. Our goal is to provide the latest findings while preserving information of relevance to the "classic" studies in the field. Students will therefore have the best of all worlds, with the opportunity to learn about cherished traditions in adult development and aging but also to learn where this exciting field is headed in the coming decades.

Supplements

Wiley is pleased to offer an online resource containing a wealth of teaching and learning materials at http://www.wiley.com/college/whitbourne.

Website Links

References in this edition show the websites that students and instructors can consult to gather updated information on changes in the field.

INSTRUCTOR RESOURCES

Instructor's Manual

The content in the Instructor's Manual reflects the 40 years of experience that Susan has in teaching this course. You will find chapter outlines, key terms, learning objectives, and lecture suggestions. We have updated our suggestions for videos and also provide instructors with resources for films, music, and literature.

PowerPoint Slides

Prepared for use in lectures, we provide you with a complete set of PowerPoint slides tested in Susan's class and designed specifically for this book. Instructors can easily adapt them for their own specific needs.

Test Bank

Instructors have access to a complete downloadable test bank that includes 50 questions in each chapter that follow the order in which concepts are presented in the text. Each multiple-choice question is labeled according to the concept it tests, along with its difficulty level (based on class testing). We include short answer and essay questions that correspond with each section of the chapter. Because they are in convenient Microsoft Word format, instructors can adapt them to their own particular needs.

ACKNOWLEDGMENTS

Our first set of acknowledgments goes to our families. Husbands Richard O'Brien and Erik Gleason have graciously provided important support that allowed us to spend the many hours we needed over the period of a year to revise the book. Jennifer O'Brien, daughter and sister, is a wonderful sounding board for our ideas; as she continues her career in clinical psychology, we look forward to continued "collaboration" with her. We would also like to thank the newest members of our family—namely Theodore James Gleason, age 4 at the time of this writing, and Scarlett Beth Gleason, who has just turned three. Susan is thrilled to be a grandmother, experiencing the joys of this special status on a first-hand basis.

Throughout the writing of this book, students in the Psychology of Aging class at the University of Massachusetts Amherst provided valuable insights and observations. As we were revising the book and preparing the lectures, student continued to provide us with fresh perspectives. Their good humor, patience, and willingness to experiment with some new ideas have made it possible to add the all-important student viewpoint to the finished product. We also appreciate the contributions of Susan's graduate teaching assistants, who serve as sounding boards in her preparation and review of lecture content.

Our final thanks go to the reviewers over the years who provided helpful comments. Their insightful observations and thoughtful proposals for changes helped us tighten and focus the manuscript and enhance the discussion of several key areas of interest in the field. Thank you to Alex Bishop (Oklahoma State University), Sue Burdett-Robinson (Hardin-Simmons University), Alvin House (Illinois State University), Gary Montgomery (The University of Texas-Pan American), and Nancy Partika (Triton College). We have also benefited from informal reviews provided by our colleagues who use the book in their teaching. We greatly appreciate their helpful suggestions.

In conclusion, we hope that we have given you something to look forward to as you venture into the fascinating field of adult development and aging and that the subsequent pages of this book will fulfill these expectations. We aim to present a comprehensive but clear picture of the area and hope that you will be able to apply this knowledge to improving your own life and the lives of the older adults with whom you may be preparing to work. We hope you will come away from the course with a positive feeling about what you can do to "age better" and with a positive feeling about the potentialities of later life. And maybe, just maybe, as has happened on many past occasions with people who read this book and take our courses, you will decide to pursue this field and we can welcome you as colleagues in the coming years.

Finally, we would like to comment on the process of working together as a mother–daughter team. The first author was pregnant with the second author when she embarked on her first textbook in the field, the precursor to the present volume. Little did she know that the child

she was about to have would become a psychologist, much less a specialist in aging. We greatly enjoy writing this book and are proud and happy to be able to share our perspectives with you, the reader.

Susan Krauss Whitbourne, Ph.D.
Stacey B. Whitbourne, Ph.D.
September 2016

ABOUT THE AUTHORS

Susan Krauss Whitbourne, Ph.D., professor of psychology at the University of Massachusetts Amherst, received her Ph.D. in developmental psychology from Columbia University in 1974 and completed a postdoctoral training program in clinical psychology at the University of Massachusetts at Amherst, having joined the faculty there in 1984. Her previous positions were as associate professor of education and psychology at the University of Rochester (1975–1984) and assistant professor of psychology at SUNY College at Geneseo. Formerly the Psychology Departmental honors coordinator at the University of Massachusetts Amherst, she is director of the Office of National Scholarship Advisement where she advises students who apply for the Rhodes, Marshall, Fulbright, Truman, and Goldwater Scholarships, among others. In addition, she is faculty advisor to the University of Massachusetts Chapter of Psi Chi, a position for which she was recognized as the Eastern Regional Outstanding Advisor for the year 2001 and as the Florence Denmark National Faculty Advisor in 2002. She served as eastern region vice president of Psi Chi in 2006–07 and as chair of the program committee for the National Leadership Conference in 2009. Her teaching has been recognized with the College Outstanding Teacher Award in 1995 and the University Distinguished Teaching Award in 2001. Her work as an advisor was recognized with the Outstanding Academic Advisor Award in 2006. In 2003, she received the American Psychological Association (APA) Division 20 (Adult Development and Aging) Master Mentor Award and the Gerontological Society of America (GSA) Behavioral and Social Sciences Distinguished Mentorship Award.

Over the past 20 years, Dr. Whitbourne has held a variety of elected and appointed positions in APA Division 20 including president (1995–96), treasurer (1986–89), secretary (1981–84), program chair (1997–98), education committee chair (1979–80), Student Awards Committee chair (1993–94), Continuing Education Committee chair (1981–82), and Elections Committee chair (1992–93). She has chaired the Fellowship Committee and serves as the Division 20 representative to the APA Council (2000–2006 and 2009–2014, and 2017– present). She is a fellow of Divisions 1 (General Psychology), 2 (Teaching of Psychology), 9 (Society for the Study of Social Issues), 12 (Clinical Psychology), 20, and 35 (Society for the Psychology of Women). She served on the APA Committee on Structure and Function of Council, chaired the Policy and Planning Board in 2007, served on the APA Membership Board, chairs Women's Caucus and Coalition of Scientists and Applied Researchers in Psychology, and is now on the Board of Educational Affairs. In 2011, her contributions were recognized with an APA Presidential Citation.

Dr. Whitbourne is also a fellow of the American Psychological Society and is currently the Chair-Elect of the Eastern Psychological Association. She is Chair of the Behavioral and Social Sciences Section of the Gerontological Society of America. She is past president of the Council of Professional Geropsychology Training Programs. A founding member of the Society for the Study of Human Development, she was its president from 2005 to 2007. She is also a founding member of the Society for the Study of Emerging Adulthood. She also serves on the Board of Directors of the National Association of Fellowship Advisors. In her home of Amherst, Massachusetts, she has served on the Council on Aging (2004–07) and was the president of the Friends of the Amherst Senior Center (2007–09).

Her publications include 17 published books, many in multiple editions, and more than 160 journal articles and chapters, including articles in *Psychology and Aging, Psychotherapy, Developmental Psychology, Journal of Gerontology, Journal of Personality and Social Psychology*, and *Teaching of Psychology*, and chapters in the *Handbook of the Psychology of Aging, Clinical Geropsychology, Comprehensive Clinical Psychology (Geropsychology)*, the *Encyclopedia of Psychology*, and the *International Encyclopedia of the Social and Behavioral Sciences*. She has been a consulting editor for *Psychology and Aging*, serves on the editorial board of the *Journal of*

Gerontology, and was a consulting editor for *Developmental Psychology*. She is editor-in-chief of the Wiley-Blackwell *Encyclopedia of Aging*. Her presentations at professional conferences number over 250 and include several invited addresses, among them the APA G. Stanley Hall Lecture in 1995, the EPA Psi Chi Distinguished Lecture in 2001, and the SEPA Invited Lecture in 2002. In addition to her professional writing, she writes a blog for *Psychology Today* called "Fulfillment at Any Age" and posts to the Huffington Post "Post 50" website.

Stacey B. Whitbourne, Ph.D., received her Ph.D. in social and developmental psychology from Brandeis University in 2005 where she was funded by a National Institute on Aging training fellowship. She completed her post-doctoral fellowship at the Boston University School of Public Health, Department of Epidemiology, funded by a National Institute on Aging Grant and a Department of Veterans Affairs Rehabilitation Research and Development Service Grant. Currently, she is a research health scientist at the Massachusetts Veterans Epidemiology and Research Information Center (MAVERIC), an independent research center housed within the VA Boston Healthcare System. She also serves as program director for the Million Veteran Program, a longitudinal health and genomic cohort funded by the Department of Veteran's Affairs Office of Research and Development. In addition, she is an instructor of medicine at Harvard Medical School and an associate epidemiologist at the Division of Aging at Brigham and Women's Hospital. The author of several published articles, she is also a coauthor on a chapter for the Sage Series on Aging in America. She is a member of the American Psychological Association Division 20 and the Gerontological Society of America. A member of the Membership Committee of Division 20, she has also given more than 30 presentations at national conferences. As an undergraduate, she received the Psi Chi National Student Research Award. In graduate school, she was awarded the Verna Regan Teaching Award and an APA Student Travel Award. She has taught courses on adult development and aging at Brandeis University and the University of Massachusetts Boston.

CONTENTS

1

Themes and Issues in Adult Development and Aging

The Information Age

TOPICS

Themes and issues

Models of development

Methods

Physical changes

Health

Memory and attention

Higher-order cognition

Personality

Relationships

Work and retirement

Mental health

Long-term care

Death and dying

Successful aging

Did you know that the White House has a Snapchat account? Or that 65% of adults between the ages of 50 and 64 use social networking sites and that adults 55 to 64 are the fastest growing Twitter users? In fact, adults 50 and older are part of the fastest growing segment using the Internet on a regular basis. These advances are all thanks to the information age. Also referred to as the computer or digital age, the information age sparked a new era in the late 1960s when vast amounts of information became regularly available through computer and digital technology. The advent of cell phones and smartphones in the 1990s and 2000s offered people the ability not only to stay in touch on the go with friends and family but also to stay connected to them through outlets such as email and social media.

Do you recall life before the Internet? If you're a typical college-age student, the answer is likely no. Since 1991 when the Web became publically available, we have seen the rates of online use skyrocket. For example, from 2007 to 2012, the number of Internet users doubled from 1 billion to 2 billion users, with 87% of U.S. adults reporting they use the Web. The online world itself has changed in its scope, from being a primarily information-based network to what is coined Web 2.0, which relies in part on the collaborative and interactive nature of users (think of Wikipedia as a good example). A large component of Web 2.0 reflects the rise of social media, which allows millions of users to provide content and input.

Once geared toward the younger population, social media developers are now turning their focus primarily from the online habits of that generation and are directing efforts to understand better how the older adult population uses and navigates the online world. If you cannot imagine life without computers, the Internet, or your smartphone, imagine the difficulty older adults face while living with the rapidly changing technological environment. You may scoff at a grandparent (or even parent!) who uses a flip phone but remember that for a long time there were only rotary phones. Don't know what a rotary phone is? Google it!

At the beginning of each chapter, we will discuss the impact that the information age has had on the aging population with respect to the chapter's content. Interested in how the Internet has changed the workforce or whether computers have enhanced older adults' memory functioning? Stay tuned! Our hope is you find these snippets of information thought provoking and engaging. Perhaps you will even be inspired to help an older adult in your life open a Facebook account or learn how to download a smartphone app!

Aging affects everyone. Your aging process began the moment you were born. If you are of traditional college age, you're undergoing a time of transition that lasts from adolescence to adulthood. The concept of being an adult may be new to you, and the idea of being an older adult may seem far off. Our purpose in writing this book is to help you think about your own aging as well as the aging process more generally. You may have decided to take this course to help you understand your aging family members or trends in society and before long, we hope that you also think about what will happen to you as you yourself get older.

Let's start by asking you what comes to mind when you think of your current age. Is it an important part of who you are or do you not think about your actual age? Next, ask yourself whether you consider yourself to be an adult. What does the word *adult* mean to you? Is it a term you would use to describe others who are older than you are now? Finally, what are your thoughts about the aging process? When you think of older adults, do you immediately regard them as unable to care for themselves? What is the "typical" older adult like, in your eyes?

Just by thinking about these questions, you've already started to focus on what age means in terms of your overall sense of self. These are the types of questions that we'll explore throughout the book. Even as we discuss in-depth the effects of the aging process throughout adulthood, we will often come back and question how much we really know about a person based on age alone. We'll also show you that some age distinctions are almost arbitrary. Someone decided that a certain age means you're in a certain stage of life; from that point forward, people attribute a great deal of meaning to that particular number. In reality, however, the aging process isn't completely linked to the passage of time alone.

Our goal is to encourage you to take personal explorations as you gain factual information about the aging process. Not only will the material help you in your career regardless of what field you go into, but it will also help you understand yourself and how you change over time. You'll also learn, perhaps surprisingly, that you don't have to sit back and let the aging process passively affect you. There are active steps you can be taking now to make sure that you keep functioning as well as possible for as long as possible throughout your entire life. With a few simple precautions, you can avoid the illnesses that limit people's ability to enjoy themselves into their later decades.

If you're a traditional college-age student heading into your 20s, we hope to help you appreciate that it is never too early to start incorporating these changes into your lifestyle. And for our readers of nontraditional college age,

we hope to help you see that it's never too late to initiate behaviors that can maintain, if not enhance, your everyday functioning. A key goal we have in writing this book is to involve you in the progression of your aging process and show you ways to be an active part of your own development.

THE BIOPSYCHOSOCIAL PERSPECTIVE

We organize the book around the **biopsychosocial perspective**, a view of development as a complex interaction of biological, psychological, and social processes. Aging is not a simple, straightforward progression through time. Your body undergoes biological changes largely influenced by your genetics or physiology. At the same time, you change psychologically in ways that reflect what's happening to your body that, in turn, affect your body's changes. All of this takes place in a social context. Holding biology and psychology constant, people age differently depending on where and when they live, whom they interact with, and what resources they have available to them.

Figure 1.1 captures this complex biopsychosocial interaction. Biological processes refer to how the body's functions and structures change throughout the aging process. We cover these changes in the chapters on normal aging and health. Psychological processes include the individual's thoughts, feelings, and behaviors related to growing older. We examine these changes in the chapters on cognition, personality, and emotions. The social processes of aging reflect the cultural, historical, and interpersonal influences on the individual. We cover

FIGURE 1.1

The Biopsychosocial Model

Biological	• Physiological factors • Genetics
Psychological	• Cognition • Emotions • Personality
Sociocultural	• Social context • History • Culture

these in chapters about relationships, family, work, and institutionalization. In Chapter 2, we will explore how life-span development theories grapple with explaining how these complex processes all interrelate. You'll find that there's a great deal more to aging than you probably imagined when you first started reading this chapter.

As you can see from the biopsychosocial model, we intend to go beyond "psychology" in teaching you about the processes involved in adult development and aging. In fact, **gerontology**, the scientific study of the aging process, is an interdisciplinary field. People who devote their professional lives to the study of gerontology come from many different academic and applied areas—biology, medicine, nursing, sociology, history, and even the arts and literature. It's almost impossible to be a gerontologist without applying this integrative view to your work. Knowledge, theories, and perspectives from all disciplines contribute importantly to the study of the individual over time.

To help put it all together for you as you develop throughout adulthood, we will pay special attention to the concept of **identity**. Identity is defined as a composite of how people view themselves in the biological, psychological, and social domains of life. The interaction of these domains forms an overall view of the "self."

FOUR PRINCIPLES OF ADULT DEVELOPMENT AND AGING

We begin our study of adult development and aging by sharing a set of four principles that form the foundation of our biopsychosocial approach (see Table 1.1). As you read the book, you'll find that we return frequently to these principles, which we highlight when they appear in the chapter. If you begin to understand them now, you will find the course material much easier to master.

1. Changes Are Continuous Over the Life Span

First and foremost, changes over the life span happen in a continuous fashion. According to the **continuity principle**, the changes that people experience in later adulthood build on the experiences they had in their earlier years. This means we can never isolate the later years of life without considering the years preceding them. Since time moves in a forward direction, the changes throughout life build upon themselves in a cumulative fashion. If you were hard on your body as a young adult, chances are the changes you'll undergo when you're older will be more negative than if you took good care of yourself.

TABLE 1.1
The Four Principles of Adult Development and Aging

Principle	Meaning
1. Changes are continuous over the life span	*Individuals remain the "same" even though they change*
2. Only the survivors grow old	*Aging individuals are increasingly self-selected*
3. Individuality matters	*People vary within and between age groups*
4. Normal aging is different from disease	*Intrinsic aging processes are different from those associated with illness*

The continuity principle also applies to the way that people think about their own identities. You know that you're the same person you always were, despite getting older. Birthdays don't transform you into a different person. You don't look the same to others, but you feel essentially the "same" on the inside.

When others look at you, however, they don't necessarily share this perspective. People don't meet you for the first time and think about what you were like when you were younger—they see you as you are now. Unless they are close relatives or friends, they have no way of knowing what you were like when you were in your childhood or teenage years. Anyone meeting you now judges you on the basis of your current appearance because he or she has no other data from which to draw.

Similarly, when you look at a middle-aged or older adult, it's unlikely that you judge that person on the basis of how he or she may have been in the past. You see an older woman, perhaps walking with a little difficulty, and don't stop to think that she might have been a marathon runner in her youth. However, that very same older woman knows that she is the "same" person she's always been. True, she can no longer compete for a marathon, but this accomplishment is part of her identity. She knows her physical abilities have changed, but to herself she's still the Jane, Barbara, or Mary she has been her entire life.

There's an important implication of the continuity principle for anyone working with older adults. You need to remember that they would prefer to be treated as the people they always were, rather than as "old people." As we'll see later, older adults are often stereotyped as weak and infirm, when in reality, they want to be viewed as individuals who possess strengths they have built up over their entire lives. They don't want to be stereotyped on the basis of the way they look to the world right now.

Robert L. Zentmaier/Photo Researchers, Inc.

Robert L. Zentmaier/Photo Researchers, Inc.

Robert L. Zentmaier/Photo Researchers, Inc.

Over the progression of time, as shown in these photos of the same man from age 3 through 82, people may feel the same inside even though their outer appearance changes.

Some nursing home administrators, eager to remind their employees of this fact, display pictures of the residents from their younger years on the nameplates outside their doors. The residents and their visitors think of them in this way, and it's helpful if those who work with them are reminded of this fact as well.

2. Only the Survivors Grow Old

The **survivor principle** states that the people who live to old age are the ones who managed to outlive the many threats that could have caused their deaths at earlier ages. Perhaps this is obvious because clearly, to grow old, you have to not die. However, the survivor principle is a bit more complex than that. Contrary to the Billy Joel song "Only the Good Die Young," it's not the good who die young, but the ones who fall victim to the forces that cause people to lose their lives. Some of these are random, to be sure, such as being killed by someone else in an accident, by an act of war, or in a natural disaster. However, many other factors that lead some to survive into old age are nonrandom. Survivors not only manage to avoid random causes of their own fatalities but also are more likely to take care of their health, not engage in risky behaviors (such as driving too fast or getting involved in crime), or using drugs and alcohol excessively.

The survivor principle exemplifies the biopsychosocial perspective. The very fact that survivors avoid death until late in life suggests that they may have inherited good genes or at least managed to maintain their physical abilities (biological factors), are cognitively and emotionally healthy (psychological factors), and have surrounded themselves with a good support system (social factors). Furthermore, these factors build on each other. People with stronger cognitive skills are more likely to attend college which, in turn, provides them with greater economic resources that can sustain their health and well-being. A combination of mental and physical health and adequate resources, plus a dose of good luck, allow them to be with us today.

Table 1.2 shows the five most common behaviors that prevent people from living a longer life (Kamimoto, Easton, Maurice, Husten, & Macera, 1999). We derived this list from the U.S. Centers for Disease Control and Prevention (CDC), and although the list dates back to 1999, the same survival tactics hold true today. We decided to call them, ironically, "Five Ways to Shorten Your Life" to highlight the fact that if you want to make sure you don't survive, these will guarantee that outcome. Most people would prefer not to shorten their lives, and certainly not to develop poor health in their later years, but they still go on to engage in behaviors that will have these effects. Survivors, for whatever reason, managed to avoid falling into these traps and are therefore healthier and longer-living than the ones who did.

The survivor principle has important theoretical implications. Survivors are not like the people born at the same time as they were. They may have been born with greater resilience, but they also likely took care to maintain their health and preserve their longevity. There are so many ways to lose one's life as you get older, from such causes as terminal illness or accidents, that to become an older adult, you have to possess some incredibly special characteristics.

The survivor principle also impacts the way we understand research on aging. Clearly, all older adults who participate in research are survivors of the conditions that

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TABLE 1.2

Five Ways to Shorten Your Life

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1. Being overweight
2. Drinking and driving
3. Eating inadequate fruits and vegetables
4. Being physically inactive
5. Smoking

Source: Adapted from Kamimoto, L. A., Easton, A. N., Maurice, E., Husten, C. G., & Macera, C. A. (1999). Surveillance for five health risks among older adults—United States, 1993–1997. *Morbidity and Mortality Weekly Reports*, *48*(SSO8), 89–130.

others did not endure. As time goes by, more and more of the older population will die. When they reach age 90 or 100, they most likely represent a different population than their now-deceased age mates. The older they get, the more select they become in such key characteristics as physical functioning, health, intelligence, and even personality (Baird, Lucas, & Donnellan, 2010).

Consequently, when we examine differences between younger and older people, we must keep in mind that older people alive today were a special group when they were young. The younger adults have not yet been subjected to the same conditions that could threaten their lives. Some of them will die before they reach old age. Knowing who will be the survivors is almost impossible to predict, of course, meaning we may be comparing highly select older adults with a wider range of younger adults. Therefore, we cannot conclude that age "caused" the older adults to have the characteristics they have now because they might always have been a special subset of their own age group.

To help illustrate this principle, consider data on the psychological characteristic of cautiousness. One of the tried and true findings in the psychology of adult development and aging contends that older people are less likely to take risks than are younger people. Similarly, older adults are less likely to engage in criminal behavior. It's possible that as people age they are better able to avoid behaving in ways that could bring them harm or get them arrested. Alternatively, it's possible that they did not change at all and are the only ones left standing from their generation. The people more likely to make risky decisions early on in life died at younger ages or were imprisoned. Certainly, those who made poor health decisions would be less likely to have survived into old age.

As a result of the survivor principle, you need to remind yourself continually throughout this book that the older adults we study may have become less risky, more honest, or better able to take care of their health. On the other hand, they may not have changed at all—only survived long enough for us to study them.

3. Individuality Matters

A long-held myth regarding development is that as people age, they all become alike. This view is refuted by the principle of **individuality**, which asserts that as people age, they become more different from each other. This divergence occurs in people's physical functioning, psychological performance, relationships, interest in work, economic security, and personality.

In one often-cited study, still considered relevant, researchers examined a large number of studies of aging to compare the divergence among older versus younger adults on measures of the same characteristics (Nelson & Dannefer, 1992). Research continues to underscore the notion that individuals continue to become less alike from each other with age. Such findings suggest that diversity becomes an increasingly prominent theme during the adult years, a point we will continue to focus on throughout this book.

The idea of increasing divergence among older adult populations does not mean that everyone starts out at exactly the same point when they're young. There are always going to be differences within any sample of people in almost any characteristic you can name. The issue is that as people get older, these differences become magnified. The top-performing person in a sample of young adults may be 10 points higher than the next highest performer. By the time, this person reaches his or her 70s or 80s, these differences may grow by a factor of two, three, or more. In part, this is a statistical fluke. As you'll learn in Chapter 3, it's difficult to find a sample of older adults who are as close in age as are the young adults researchers tend to study (who are often within 2 or 3 years of each other). If age is related to performance, then the odds are that the older group will differ simply because they differ more in age.

However, the increasing variation among older adults isn't just a statistical artifact. Even if you had a sample of older adults who were exactly the same age, it's likely that they would differ more among themselves than they would have when they were younger because they've lived through more experiences affecting everything from their health to their psychological well-being. Those experiences have cumulative effects, causing them to change at different rates and to differing degrees.

Consider what's happened to you and the people you grew up with by this point in your life. You have made the decision to go to college, while others in your age group may have enlisted in military service. You may meet your future spouse in college, while your best friend remains on the dating scene for years. Upon graduation, some may choose to pursue graduate studies as others enter the workforce. You may or may not choose to start a family, or perhaps have already begun the process. With the passage of time, your differing experiences build upon each other to help mold the person you become. The many possibilities that can stem from the choices you make help illustrate that the permutations of events in people's lives are virtually endless. Personal histories move in increasingly idiosyncratic directions with each passing day, year, and decade of life.

There are actually two types of differences that come into play when we talk about individuality. **Interindividual differences** are differences *between* people. We've shown

<u>FIGURE 1.2</u>

Interindividual Differences in Development
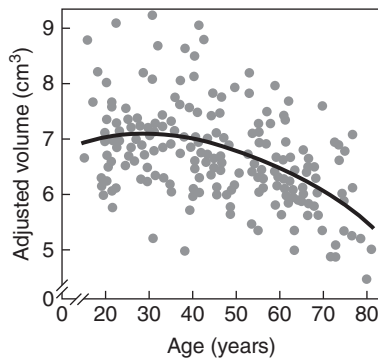
This figure shows age differences in the volume of cells in the hippocampus, a part of the brain involved in memory. The straight line shows that people in their 70s may have the same brain volumes as people in their 20s.

Source: Reprinted by permission from Macmillan Publishers Ltd: Nature Reviews Neuroscience. Hedden, T., & Gabrieli, J. D. (2004). Insights into the ageing mind: A view from cognitive neuroscience. *Nature Review Neuroscience*, 5, 87–96.

an example of interindividual differences in Figure 1.2. In this figure, each dot in the graph on the right represents the size of the hippocampus, a part of the brain involved in memory thought to grow smaller as people get older. As you can see, people of the same age can vary so dramatically from one another that they may more closely resemble people from different age groups. Follow the straight line showing two dots—one representing a 20-year-old and one representing data from a 70-year-old. The hippocampus of this 70-year-old actually equals that of at least one 20-year-old. Many of the 70-year-olds have hippocampal sizes that equal those of people in their 40s. These interindividual differences clearly show that not all 70-year-olds are alike.

As this example shows, some older adults can outperform younger adults on tasks typically shown to decline with age. This sort of occurrence happens in many areas of study. Although traditionally younger adults have faster reaction times than older adults, exceptions to the norm are common. While you may think of average-age college students as being able to run faster, lift heavier weights, or solve crossword puzzles in a shorter time than people three times their age, consider the differences between a sedentary 21-year-old and a 72-year-old triathlete. Chances are, the triathlete will outperform the sedentary adult in all categories. We will continue to explore the notion that

functioning does not necessarily need to "go downhill" as people get older.

Intraindividual differences refer to the variations in performance within the same individual. In other words, not all systems develop at the same rate within the person. Some functions may increase over time, others decrease, and others stay the same. Even within a construct such as intelligence, an individual may show gains in one area, losses in another, and stability in yet another domain. Intra-individual differences illustrate the fact that development can proceed in multiple directions within the same person (Baltes & Graf, 1996), a concept known as **multidirectionality**.

4. "Normal" Aging Is Different From Disease

The principle that **normal aging is different from disease** means that growing older doesn't necessarily mean growing sicker. It is important for both practical and scientific reasons to distinguish between normal aging and disease. Health care specialists who work with middle-age and older adults need to recognize and treat the onset of a disease rather than dismiss it simply as "getting older." For example, an 80-year-old man exhibiting symptoms of depression can be successfully treated, assuming that the clinician does not write his symptoms off as a feature of normal aging. Personality development in adulthood does not inevitably lead to the depressive symptoms of lowered self-esteem, excessive guilt, changes in appetite, or lack of interest in activities. Older adults may experience some moderation in personality qualities such as becoming a bit less judgmental in relation to others. However, the development of psychological disorders for the first time in later life is not typical. Clinicians who mistakenly think that these symptoms are part of the normal aging process won't take the proper course of treatment that could alleviate the depressed person's suffering.

Gerontologists translate the principle that normal aging is different from disease into terms that distinguish these processes. **Primary aging** (or **normal aging**) refers to the normal changes over time that occur due to universal, intrinsic, and progressive alterations in the body's systems. Changes over time leading to impairment due to disease rather than normal aging are referred to as **secondary** or **impaired aging**. These changes are not due to universal, intrinsic processes but are a function of an abnormal set of changes afflicting a segment rather than the entirety of the older population (Aldwin & Gilmer, 1999). Skin wrinkling and discoloration are examples of the development of skin cancer in later life and secondary aging.

This highly fit triathlete has physical skills that would rival those of a sedentary young adult, further illustrating the principle of individual differences. He also provides an example of optimal aging.

The third type of aging process sets in toward the very end of life, when individuals experience a rapid loss of functions across multiple areas of functioning. This precipitous decline is called **tertiary aging** (Gerstorf, Ram, Lindenberger, & Smith, 2013). Representing the impact of disease on perhaps already compromised areas of functioning, tertiary aging deserves mention in its own right as distinct from primary or even secondary aging.

Primary, secondary, and tertiary aging refer to processes that, over time, accumulate, and in the absence of accident or injury, cause the individual's death. Gerontologists believe that despite changes in the body that lead to loss, aging can also involve gains. The term refers to age-related changes that improve the individual's functioning. Changes due to optimal aging may reflect the preventative or compensatory measures that adults take to counter the toll that aging would normally take on their physical and psychological functioning. However, some individuals do not even make special efforts to alter their own aging, but for reasons not always entirely clear, seem to age at a slower rate than their peers. They may be the ones who never seem to get sick right until the very end of their lives, when a sudden illness leads to their death (i.e., tertiary aging).

Throughout life, age-related losses due to primary, secondary, and tertiary aging occur contemporaneously, as we show in Figure 1.3. Thus, even while optimal aging can slow the deleterious changes of primary and secondary aging, eventually tertiary aging takes over and the individual's life comes to an end. Remember that, according to the principles of intraindividual and interindividual variability, the rates of each type of aging vary within individuals and from person to person.

FIGURE 1.3

Age-Related Losses and Gains
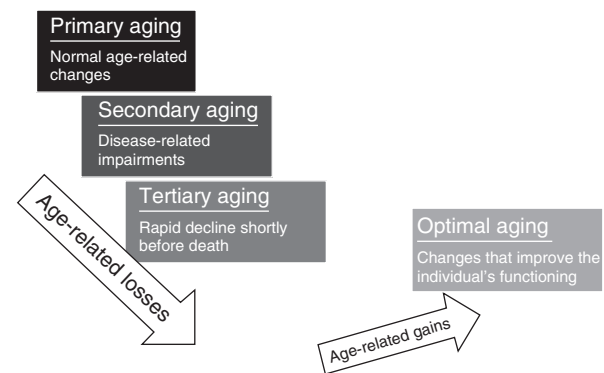
THE MEANING OF AGE

The study of aging implies that age is the major variable of interest. However, the scientific study of aging faces a challenge in that age carries with it a number of problems as that major variable of interest. To be sure, there is value in categorizing individuals in later life based on their age. At the same time, attaching a numerical value to people on the basis of their date of birth carries with it a certain arbitrariness. Chronological age is a number based on measures of the Earth's movement around the sun; however, we don't know how much the changes in the physical universe relate to what goes on inside the body in any kind of precise fashion.

Consider what happens when people's ages change at a major birthday such as reaching the age of 40. The crossing from an age that ends in 9 to an age that ends in 0 may lead people to engage in self-scrutiny just because we've all been socialized to believe that 40 means something important. This belief is reinforced by birthday cards that invoke the "over the hill" metaphor. In truth, your body does not change in discrete fits and starts when you pass a particular birthday.

The body does keep time in a cycle that approximates a 24-hour period, but there is no evidence at the moment to suggest that this time pacemaker is related to aging. To say that chronological age (or time) "means" anything with regard to the status of the body's functioning is, based on current evidence, questionable. The popularity of such phrases as "30 being the new 20" and "60 the new 50" capture the difficulty of defining people's aging processes based solely on a number Chronological age does have some value in describing a person, but like other descriptive features of a person, such as gender or eye color, it is the social meaning attached to chronological age that often outweighs any intrinsic usefulness. As we have already discussed, people of the same age can vary substantially from one another, and people of different ages can be more similar to each other than their differing age might lead you to expect.

Using Age to Define "Adult"

Now that we have you thinking about the meaning of age, we will move on to the next challenge—the meaning of the word "adult." Earlier, we asked you to decide whether you consider yourself an adult. When you think of that word, perhaps the synonym of "mature" comes to mind. This, in turn, may conjure up images of a person reaching a certain level of accomplishment or growth. Consider, for example, the term "mature" in reference to an apple. A mature apple is one that is ready to be eaten, and you can judge that by examining the apple's color, size, and texture. An apple's maturity level is relatively easy to measure compared to judging the maturity of humans. The complexity of the biopsychosocial processes that occur within us are far more difficult to quantify.

You might think that the most logical definition of maturity should be based on physical development. Yet, you also know that a 13-year-old male who has essentially reached his full physical development would, in contemporary Western society, be regarded as anything but an adult. Although his physical attributes define him as an adult, the psychological and social standards would not.

Perhaps a standard based on ability is a better option. Consider 16 years, the age when most people can legally drive. Or, alternatively, consider age 18, when U.S. society ordains the person with the right to vote. Using the age of 21 presents another possible point of entry into adulthood. Because it is the age when American adults can legally drink alcohol, for many, the turning of 21 represents a defining mark of the beginning of adulthood. However, the United States is in a small minority of nations that set the drinking age at 21. Some Canadian provinces set the drinking age at 19 (though it is 18 in most); countries such as Germany, Barbados, and Portugal set it at 16. These conflicting age demarcations for even such a seemingly concrete behavior as drinking alcohol show that deciding when a person is an adult on this basis has very limited utility.

Parenthetically, the variations in the legal drinking age shown from country to country (and even within a country) illustrate the interaction of biological and sociocultural factors in setting age-based parameters around human behavior. People in Canada who are 18 years old are, on average, not all that physiologically distinct from 18-year-olds who live in France. For that matter, they are probably not even psychologically different. It's the culture that distinguishes whether they're able to drink alcohol without getting arrested.

If you're like many students, the age of 25 may hold special importance for you. This is the age where, in the United States, you can rent a car (without having to pay a tremendous surcharge). This age has no inherent meaning, but it is used by car rental companies because the chances of having an auto accident are lower after the age of 25. It's possible that a switch is flicked on a person's 25th birthday so that the unsafe driver now has become a model of good behavior on the road. However, the odds are statistically higher that people under age 25 are more likely to engage in the risky combination of drinking and driving, which is what leads to the higher insurance premiums.

Another set of criteria related to the age of adulthood pertains to when people can marry without the consent of their parents. There again, we find huge variation. Within the United States alone, the age of consent varies from state to state (in South Carolina it is 14, while other states deem 16 or 18 the appropriate age). Moreover, the age when people actually marry reflects factors such as the health of the economy; in bad economic times, the median age of marriage goes well above the age of consent. During these times, people in their 20s (or older) may find they're forced to move back in with their parents because they aren't earning sufficient income to rent or buy their own place. Does that mean that people become less "adult" when the economy lags?

Given these contradictory definitions of "adult," it might be wise to recommend that we set the threshold into adulthood based on the individual's having reached the chronological age associated with the expectations and

privileges of a given society or subculture. For example, in the United States, individuals may be considered to have reached adulthood at the age when they are eligible to vote, drink, drive, and get married. For the majority of U.S. states, the age of 21 is therefore considered the threshold to adulthood. In other countries, these criteria may be reached at the age of 18. Regardless of the varying definitions, up to as many as the first 10 or 11 years of adulthood represent the period of **emerging adulthood**, or the transition prior to assuming the full responsibilities associated with adulthood, normally the years 18 to 29 (Arnett, 2000). These responsibilities may occur during the years that follow college graduation or, for those individuals who do not attend college, when they face the need to find full employment or make family commitments.

Divisions by Age of the Over-65 Population

Traditionally, 65 years of age has been viewed as the entry point for "old age." There was no inherent reason for the choice of this age other than that in 1889, the German Chancellor Otto von Bismarck decided to set this as the age when people could receive social insurance payments. Now, we accept age 65 without giving it much thought.

Gerontologists recognized long ago that not only was 65 an arbitrary number for defining old age, but that it also resulted in people being placed into too broad of a category when defined as older adults. All other things being equal, a 65-year-old faces very different issues than someone who is 85 or 90. There are certainly 65-year-olds in very poor health and 95-year-olds who have no serious ailments. But because, on average, 65-year-olds are so different than those who are 20 or more years older, we use a convention to break the 65-and-older category into subgroups.

The subgroups most frequently used in gerontology are **young-old** (ages 65 to 74); **old-old** (ages 75 to 84); and **oldest-old** (ages 85 and older). We shouldn't place too much credence on numbers, as we've already said, but these are good approximations for roughly categorizing the 65-and-older population. Bernice Neugarten, one of the early pioneers in psychological gerontology, proposed these distinctions in the mid-1960s, and they have remained in use to this day even though 85 may be the "new" 65 with the oldest-old being in better health than they were 50 years ago.

With more and more people living to the oldest-old category as defined in this manner, gerontologists are reexamining the divisions of the 65+ age group. Specifically, people over the age of 100, known as **centenarians**, are becoming more and more commonly represented in the population, as we will show later in the chapter. It will

not be long before the very highest age category becomes more prominent—the **supercentenarians**, who are 110 and older. Typically, the oldest person in the world at any given time is between the ages of 114 and 116. Jeanne Louise Calment, the oldest documented living human, was 122 at the time of her death. Supercentenarian will probably retain its definition as 110 and over, though, at least for the foreseeable future.

Functional Age

Discontented with the entire concept of chronological age, a number of gerontologists are devising a new classification system that is based not on what the calendar says but on **functional age**, which is how people actually perform (see Figure 1.4). With functional instead of chronological age as the basis for a system of studying aging, we could gain a better grasp of a person's true characteristics and abilities. When we talk about research methods in Chapter 3, we'll see further advantages to using measures other than chronological age to study the aging process.

Biological age is the age of an individual's bodily systems. Using biological age instead of chronological age would tell us exactly how well people are able to perform such vital functions as the heart's pumping blood through the arteries and getting oxygen to the lungs. With biological age, you could also help people learn how best to improve their muscle and bone strength.

In order to be able to use biological age as an index, we would need a large repository of data showing what's to be expected for each major biological function at each age. For example, we'd need to know the population

FIGURE 1.4

Alternative Indices of Aging

Biological
• Functioning of organ systems

Psychological
• Functioning on psychological tests

Social
• Social roles occupied by the individual
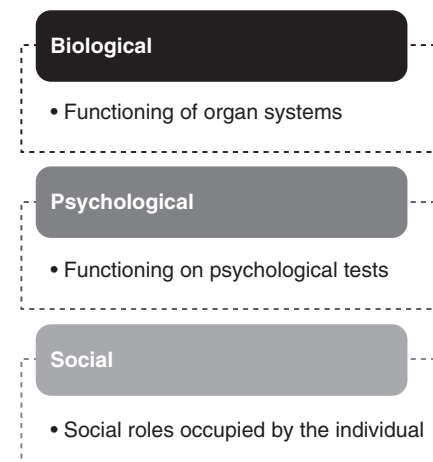
values for blood pressure readings in people with different chronological ages. Then, we would assign people a "blood pressure age" according to which chronological age of healthy people their numbers most closely match. A 50-year-old whose blood pressure was in the range of normal 25- to 30-year-olds would then have a biological age that was 20 or 25 years younger than his or her chronological age.

Popular culture has certainly caught on to the notion of biological rather than chronological age. There are a multitude of online calculators in which you answer various questions to estimate how long you will live. In addition, there are slightly more sophisticated "biological age tests" that let you calculate your "lung age," for example.

Another, far more sophisticated approach, involves measuring cellular aging. When exposed to harmful environmental conditions, the body's cells undergo important changes affecting their ability to function normally. By indexing these changes, researchers can develop a scale that assesses biological functioning at this very basic level (Hannum et al., 2013).

Psychological age refers to the performance an individual achieves on measures of such qualities as reaction time, memory, learning ability, and intelligence (all of which are known to change with age). Like biological age, a person's performance on these tasks would be compared with those of other adults and then scaled accordingly.

Social age is calculated by evaluating where people are compared to the "typical" ages expected for people to be when they occupy certain positions in life. These positions tend to center on family and work roles. For example, a grandparent would have an older social age than would a parent, although the grandparent might easily be chronologically younger than the parent.

Social age can have some interesting twists. For example, people can be grandparents in their late 20s (with a social age of 60 or older). Conversely, women can become mothers in their late 60s. Perhaps you have a friend whose grandmother is 93 and another whose grandmother is 57. We see the same issue with regard to work roles. A 70-year-old who is still working has a younger social age than a 66-year-old who has retired. Athletes and politicians present a similar contrast. A gymnast may be forced to give up her sport at 18 years of age and thus have an older social age than a still-employed legislator.

As we stated earlier, an advantage of using functional indices of aging is that they can be more accurate than chronological age. However, it's much easier to use chronological age than these sophisticated calculations. Adding

to the problem is the fact that, functional ages must be constantly calibrated and recalibrated to ensure that they continue to be accurate. For example, a biological index based in part on blood pressure may require adjustments as health practitioners change the definition of what is considered "normal." Changes in both medical knowledge and population norms for particular age groups may mean that the definition of normal blood pressure for an average 60-year-old shifts to be more typical of a person in the 70s. Psychological age and social age indices are also likely to change over time.

Despite its faults, chronological age may be the most expedient index for many areas of functioning. Just keep in mind that it does not tell the whole story.

Personal Versus Social Aging

The aging process occurs within the individual, but as you have learned already, it is shaped by events occurring in the individual's social context. When developmental psychologists study the aging process, it is difficult to disentangle those internal changes from those that reflect a changing world, though we try to do so by applying the appropriate controls in our research.

Personal aging refers to changes that occur within the individual and reflect the influence of time's passage on the body's structures and functions. This is how people ordinarily think of the aging process and, indeed, it is what is implied in primary, secondary, and tertiary aging.

Social aging refers to the effects of a person's exposure to a changing environment. Over time, the changes we see within the individual represent the unique blend of personal and social aging as these play out in that individual's life.

Within the category of social aging, the changes that take place in an individual's life are seen as reflecting a multitude of interacting factors. At any one time, the individual's life reflects one or more of three basic categories of three social influences (see Figure 1.5). These influences, identified by psychologist Paul Baltes (1979) and still seen as relevant today, include normative age-graded influences, normative history-graded influences, and nonnormative influences. We'll look at each of these in turn.

Normative age-graded influences lead people to choose experiences that their culture and historical period attach to certain ages or points in the life span. The term "normative" stems from the term "norm," which is a social expectation for behavior. In Western society, age norms traditionally dictate that individuals graduate from college in their early 20s, get married and begin a family in their
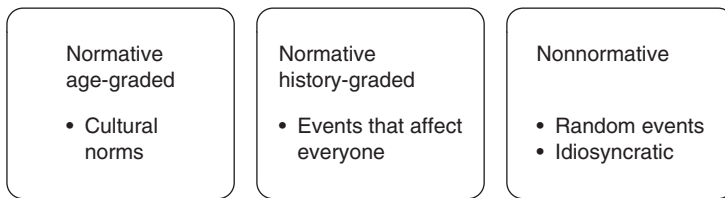
FIGURE 1.5

Types of Developmental Influences

20s or 30s, retire in their 60s, and become grandparents in their middle to later years, usually in the decades of the 50s, 60s, and beyond. These are influences on behavior to the extent that people believe that they should structure their lives according to these age demarcations.

Events that occur in response to normative age-graded influences occur in part because a given society has developed expectations about what is assumed appropriate for people of certain ages. The decision to retire at the age of 65 years can be seen as a response to the norm more true perhaps in the past than today, that 65 is the correct age to leave the labor market. Graduation from high school generally occurs at the age of 18 years for most because in most industrialized societies, children start school at the age of 5 or 6 and the educational system is based on 12 or 13 grades.

Normative age-graded influences exert their impact beyond what the norms themselves imply because people are socialized into believing that they *should* structure their lives so that they conform to these influences. When people don't adhere to these norms, for whatever reasons, they feel that there is something wrong with them. For example, a 40-year-old office worker may consider retiring but feel reluctant to do so because it is not what is expected for a person of that age in that field of employment. Similarly, a 35-year-old may prefer not to marry or to have children, but feel pressured into doing so by other family members, friends, or the society at large by virtue of having reached their mid-30s.

The normative age-graded influences are partly linked to the biological aging process. Parenthood traditionally occurs between the ages of 20 and 40, at the peak of a woman's reproductive cycle. This age range sets the normative age period for biologically becoming a parent. Once this age is set, then a lower limit is set on the age at which the adult can become a grandparent. If the child also follows a normative age-graded influence, the parent will likely become a grandparent for the first time between the ages of 55 and 65 years. Similarly, manual laborers or athletes may be at peak physical capacity up to their 40s, when they may experience loss of strength and speed.

Now let's turn to the second set of influences on development, those that relate to the impact of events in the outside world on the individual. **Normative history-graded influences** are events that occur to everyone within a certain culture or geopolitical unit (regardless of age) and include large-scale occurrences, such as world wars, economic trends, or sociocultural changes in attitudes and values. The impact of these events on people's lives may be felt immediately. They can continue to have a lasting impact for many years on the subsequent patterns of work, family, and quality of life of the people affected by those events. For example, World War II veterans who entered the military after their families were already established were more likely upon their return to get divorced or separated, to suffer career setbacks, and experience poorer physical health after they turned 50 (Elder, Shanahan, & Clipp, 1994). Had they not gone off to war, their lives may have taken a more stable course.

An individual does not have to experience a historical event directly to be affected by a normative history-graded influence. For example, in 2015, several large terrorist attacks took place in Paris, France. The impact of these events reverberated throughout Europe and North America, in particular. Anytime there is a significant enough event or set of events affecting a large number of people, the event's aftermath may continue to impact aspects of each person's life for years to come.

If the life course was influenced only by normative age- and history-graded influences, predicting the course of development of people of the same age living in the same culture would not be easy, but it would be a manageable problem. Plug in a person's age and the year of the person's birth, and you'd be able to figure out which combination of age-graded and history-graded influences set the course of that person's life. However, people's lives are also affected by **nonnormative influences**, which are the random idiosyncratic events that occur throughout life. They are "nonnormative" because they occur with no regular predictability.

There are almost an infinite number of examples of nonnormative influences. Some are due to good luck, such as winning the lottery or making a smart investment. Nonnormative influences can also be negative, such as a

Scott Vickers/Getty Images

The devastating effects of California wildfires impact hundreds of lives on a continual basis, providing an example of normative history-graded influence.

car accident, fire, or the untimely death of a relative. One moment your life is routine and predictable, and in the next, a single event irrevocably alters it. Other nonnormative influences may unfold over a gradual period, such as being fired from a job (due to personal, not large-scale economic reasons), developing a chronic illness not related to aging, or going through a divorce. In everyday language, you talk about someone benefiting from the "right place, right time" effect or—conversely—suffering a negative fate from the opposite set of coincidences.

As you have read about the various types of influences on life, it may have crossed your mind that the way in which they interact with each other is also important. Consider the example of divorce. Although society's norms have changed considerably regarding this life event, many would still consider this a nonnormative occurrence because the norm (and certainly the hope) of married couples is to remain married. And although a divorce is a personal occurrence, it may be seen in part as a response to larger social forces. For example, a couple who is exposed to financial hardship because one or both partners lost a job due to living in harsh economic times (normative historical influence) is now faced with severe emotional stress. If they are in their middle years, when couples are expected to have reached a degree of financial comfort (age-graded normative influence), their problems may be exacerbated. Yet, some couples may feel closer to each other when exposed to such adversity, and this is where the idiosyncratic nonnormative factors come into play.

This example illustrates the dilemmas faced by researchers in human development who attempt to separate out not only personal from social aging but also the

impact of particular influences that fall into the category of social aging. Though challenging, the very complexity of the equation fascinates those of us who try to understand what makes humans "tick" and what causes that ticking to change over the decades of the human life span.

KEY SOCIAL FACTORS IN ADULT DEVELOPMENT AND AGING

As we've just seen, social factors play an important role in shaping the course of our lives. Here we make explicit exactly how we define and use the key social factors that we will refer to in this book.

Sex and Gender

In discussing the aging process, there are important male–female differences related to the socialization experiences of men and women. We will use the term **gender** to refer to the individual's identification as being male or female. Gender is distinct from biological **sex**, which refers to the individual's inherited predisposition to develop the physiological characteristics typically associated with maleness or femaleness. Both sex and gender are important in the study of adult development and aging. Physiological factors relevant to sex influence the timing and nature of physical aging processes, primarily through the operation of sex hormones. For example, the sex hormone estrogen is thought to play at least some role in affecting a woman's risks of heart disease, bone loss, and possibly cognitive changes.

Social and cultural factors relevant to gender are important to the extent that the individual assumes a certain role in society based on being viewed as a male or female. Opportunities in education and employment are two main areas in which gender influences the course of adult development and becomes a limiting factor for women. Although progress has certainly occurred in both domains over the past several decades, women continue to face a more restricted range of choices and the prospects of lower earnings than do men. Furthermore, these differences are important to consider when studying the current generation of older adults, as they were raised in an era with more traditional gender expectations.

The phenomenon of transgendered individuals (i.e., those who choose to adopt the sex opposite to that they were born with) is too recent to have produced enough information relevant to aging. We might expect that this will become an area studied by gerontologists, particularly because it also highlights the role of social influences on development. Prior to the decade of the 2010s, there was relatively little social awareness of the experience of transgendered individuals and aging but this is rapidly changing (Kimmel, Hinrichs, & Fisher, 2015).

Race

A person's **race** is defined in biological terms as the classification within the species based on physical and structural characteristics. However, the concept of race in common usage is broader than these biological features. Race is used in a more widespread fashion to refer to the cultural background associated with being born within a particular biologically defined segment of the population. The "race" that people use to identify themselves is more likely to be socially than biologically determined. In addition, because few people are solely of one race in the biological sense, social and cultural background factors assume even greater prominence.

The U.S. census, a count of those living in the United States conducted every 10 years, attempts to provide an accurate depiction of the size and makeup of the country. The 2010 U.S. census defined race on the basis of a person's self-identification. The most frequently used racial categories in data reported from the census are White, Black or African American, American Indian or Alaska Native, Asian, and Native Hawaiian or Other Pacific Islander. In addition to these racial categories, the census also included categories based on national origin and allowed individuals to select more than one racial category.

To the extent that race is biologically determined, racial differences in functioning in adulthood and aging may reflect differences in genetic inheritance. People who have inherited a risk factor that has been found to be higher within a certain race are more likely to be at risk for developing that illness during their adult years.

Racial variations in risk factors may also interact with different cultural backgrounds associated with a particular race. For example, people at risk for a disease with a metabolic basis (such as inability to metabolize fats) will be more likely to develop that disease if cooking foods high in fat content are a part of their culture.

Social and cultural aspects of race may also alter an individual's development in adulthood through the structure of a society and whether there are systematic biases against people who identify with that race. As we will demonstrate throughout this book, many illnesses have a higher prevalence among the African American population than among the White population in the United States, and this has led to significant disparities in the health of the two groups. Part of the differences in health may be attributed to lack of opportunities for education and well-paying jobs, but systematic discrimination is also believed to take a toll on health by increasing the levels of stress experienced by African Americans (Green & Darity, 2010).

Ethnicity

The concept of **ethnicity** captures the cultural background of an individual, reflecting the predominant values, attitudes, and expectations in which the individual has been raised. Along with race, ethnicity is often studied in adult development and aging as an influence on a person's familial attitudes and experiences. For example, people of certain ethnic backgrounds are thought to show greater respect for older adults and feel a stronger sense of obligation to care for their aging parents. Ethnicity also may play a role in influencing the aging of various physiological functions, in part through genetic inheritance, and in part through exposure to cultural habits and traditions. Finally, discrimination against people of certain ethnic backgrounds may serve the same function as race in limiting the opportunities for educational and occupational achievements.

The term *ethnicity* is gradually replacing the term *race* as a categorical variable in social research. We will follow that tradition in this book unless there is a clear-cut reason to refer specifically to race (i.e., if we are describing research that also uses this term). However, there are occasional points of confusion in that the U.S. census occasionally combines race (White or Black) and ethnicity (Hispanic or non-Hispanic). Many census statistics break down the distributions they report into White non-Hispanic, White Hispanic, Black non-Hispanic, and Black Hispanic.

Socioeconomic Status

Socioeconomic status (SES), or "social class," reflects people's position in the educational and occupational ranks of a society. Technically, SES is calculated through a weighted formula that takes into account a person's highest level of education and the prestige level of his or her occupation. There is no one set way to calculate SES, however. Various researchers have developed scales of socioeconomic status that give differing weights to these values in coming up with a total score. People with higher levels of education tend to have occupations that are higher in prestige, and so some researchers use level of education alone as the index of SES.

Income levels are not necessarily associated with socioeconomic status. High-prestige jobs (such as teachers) are often associated with mid- or even low-level salaries. However, as a proxy for or in addition to SES, some researchers use income as the basis for analyzing social class differences in health and opportunities.

SES is an exceptionally important, but often unrecognized, influence on the aging process. In our book, we will highlight studies that connect aging with SES. One in particular stands out because of its size, length of time of follow-up, and complexity. This is the landmark investigation known as **Whitehall II**, a survey of a large sample of British adults focusing on the relationships among health, social class, and occupation. Whitehall I (the original study) was established in 1967 and involved 18,000 men working in civil service occupations in the United Kingdom. This study showed that the men in the lowest employment brackets had poorer health than their health habits would predict. In 1985, Professor Sir Michael Marmot and a team of investigators from University College London set out to determine other factors that might contribute to the poorer health of both men and women at the lower ends of the socioeconomic scale. By 2008, the study had generated a wealth of data (Council of Civil Service Unions/Cabinet Office, 2004), and Marmot's appointment in 2005 to the World Health Organization Commission on Social Determinants of Health is moving the findings squarely into global public policy.

Religion

Religion, or an individual's identification with an organized belief system, is surprisingly one of the least well-understood but presumably important influences on aging. Organized religions form a set of social structures that transcend nationality and which, additionally, are partly connected with race and ethnicity. More important, religion provides many people with a source of coping strategies, social support in times of crisis, and a systematic basis for interpreting life experiences (Klemmack et al., 2007).

Religion is distinct from spirituality, or the set of beliefs than an individual holds about such areas as the afterlife, a sense of meaning in life, and feelings of connections to others. Spirituality and its relationship to psychological well-being in later life is becoming an increasing focus of researchers in the field and will undoubtedly grow in importance over the coming years (Tomás, Sancho, Galiana, & Oliver, 2015).

THE BABY BOOMERS GROW UP: CHANGES IN THE MIDDLE-AGED AND OLDER POPULATIONS IN THE UNITED STATES AND THE WORLD

A quick snapshot of the U.S. population according to age and sex appears in Figure 1.6 (Ortman, Velkoff & Hogan 2014). The age–sex structure provides a useful way of looking at the population. A "young" population is shaped like a pyramid, an "old" population is depicted by an upside-down pyramid, and a population considered stable is shaped like a rectangle.

You can clearly see in this figure the prominence of the **Baby Boom generation**, the term used to describe people born in the post–World War II years of 1946 to 1964. This period really did represent a "boom" in that more babies were born in 1946 than ever before (3.4 million); more than 4 million were born every year from 1954 to 1964. By then, the Baby Boom generation made up nearly 40% of the entire U.S. population.

We now have several other terms for generations of Americans born in other decades, including the "Silent Generation" (those in their teens in the 1950s), the "Greatest Generation" (those who fought in World War II), "Gen X" (the children of the Baby Boomers), and the Millennials, also called "Gen Y," born in the 1990s, at the tail end of the Gen Xers. The assumption with this terminology is that you are defined in important ways by the year of your birth, clearly an overgeneralization. Nevertheless, the terms persist and at least for the Baby Boomers, they will most likely never go away.

What's important about the Baby Boom generation, apart from whatever it might mean in terms of defining any one individual, is the preponderance of individuals of similar ages moving through the population together. Not only do these groups share certain historical events, but they also create their own set of dilemmas (Whitbourne & Willis, 2006). We will learn later in the book about the
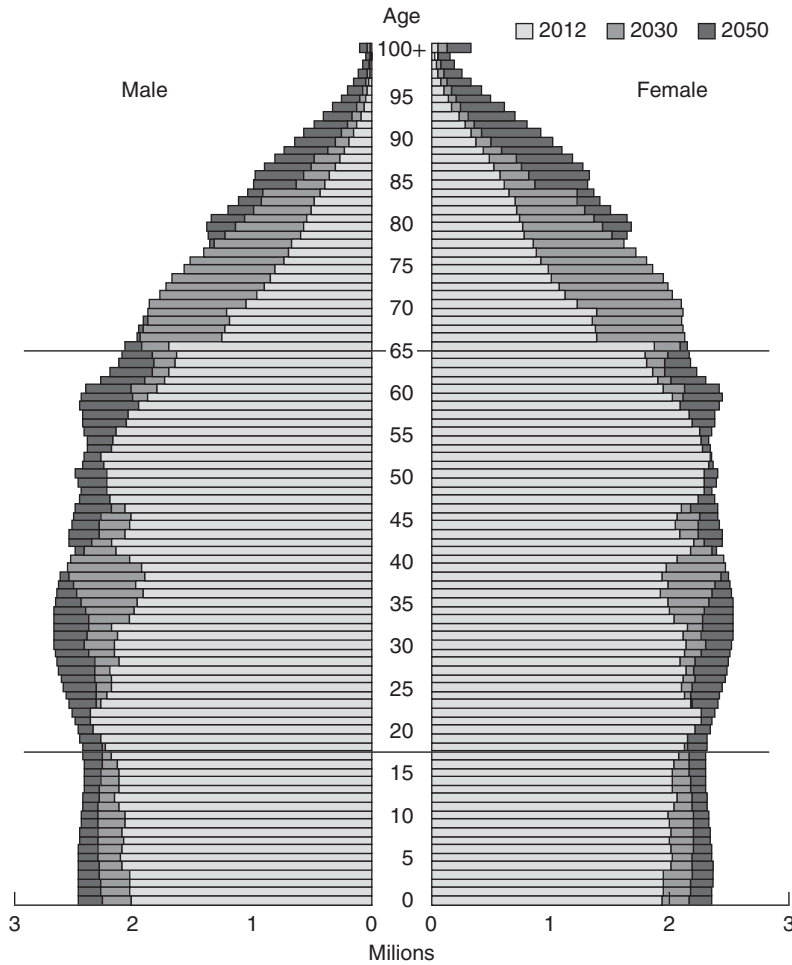
FIGURE 1.6

Age and Sex Structure of the Population for the United States: 2010, 2030, and 2050

implications for the economy, for example, of having so many people reach their 60s at similar times.

United States

In 1900, the number of Americans over the age of 65 years was 3.1 million people, making up about 4% of the population. By 2015, the number of people 65 and older in the United States was estimated to be 47.8 million, or 14.9% of the total population (U.S. Bureau of the Census, 2015a). Figure 1.7 shows the growth of the total 65 and older population as well as the rise of those in the 85 and older category.

By 2050, the U.S. Bureau of the Census estimates that there will be 88 million adults 65 and older, representing 22% of the total population; the 85 and older adults alone will number 18.9 million or 4.8% of the population (U.S. Bureau of the Census, 2015a). Perhaps most impressive is

the estimate in the growth in the number of centenarians. In 1990, an estimated 37,306 people over the age of 100 lived in the United States. By 2015, this number had increased to 72,000; by 2050 it will increase eight times to 387,000 (Howden & Meyer, 2011; U.S. Bureau of the Census, 2015a).

The major explanation for these large increases in the 65 and older population can be accounted for by the movement of the Baby Boomers through the years of middle and later adulthood. It is important to consider not just that these individuals were born during a period of high birth rates but that they are expected to live into their 80s, 90s, and 100s. This will increase the number of very-old individuals that society will experience throughout the century.

Increases in the aging population reflect the vast advances that have taken place in the average length of life. **Life expectancy** is the average number of years of life remaining to the people born within a similar period

FIGURE 1.7

Population Age 65 and Over and Age 85 and Over, Selected Years 1900– 2010 and Projected 2010– 2050
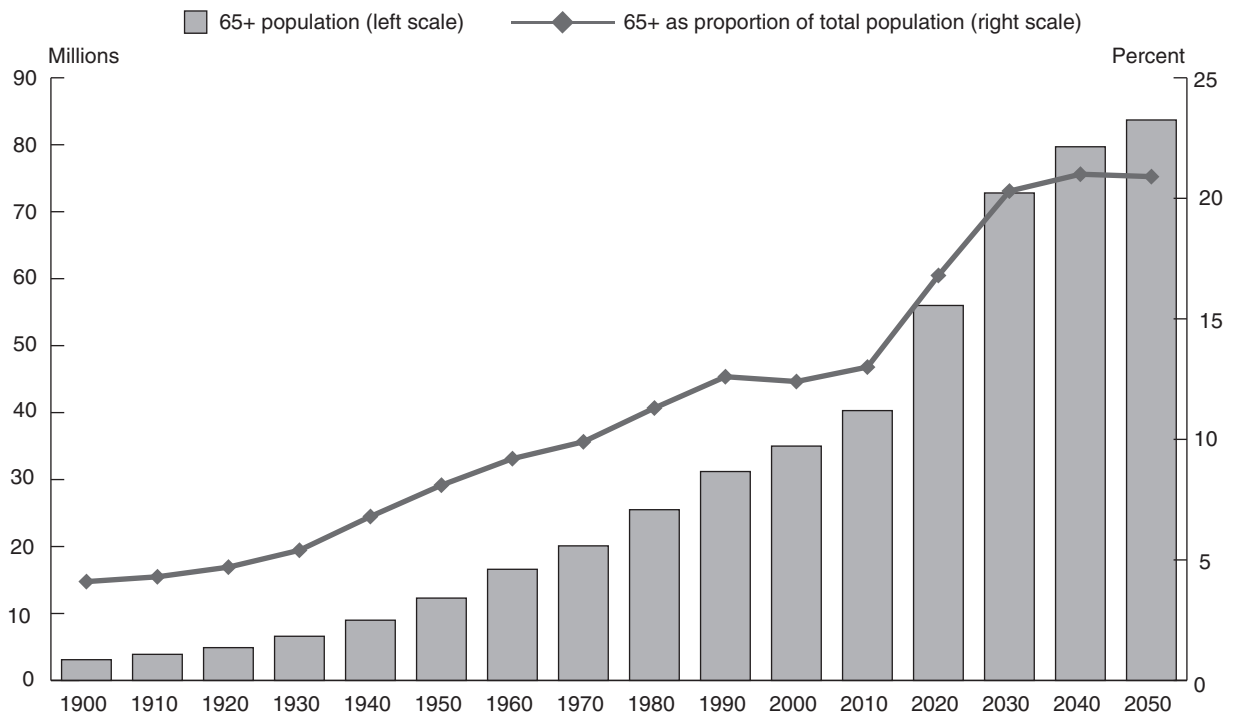
Source: West, L. A., Cole, S., Goodkind, D., & He, W. (2014). 65+ in the United States: 2010. Current Population Reports, P23–212. Retrieved from
https://www.census.gov/content/dam/Census/library/publications/2014/demo/p23-212.pdf

of time. To calculate life expectancy, statisticians take into account death rates for a particular group within the population and use these figures to project how long it will take for that entire group to die out completely. Life expectancy is not the same as **life span**, which is the maximum age for a given species. The life span of humans has not changed, but more people are living to older ages, leading to the life expectancy increase we are currently witnessing.

Life expectancy from birth rose overall from 62.9 years in 1940 to 78.8 years in 2013. Many factors have contributed to increases in life expectancy, including reduced death rates for children and young adults. People are also living longer once they reach the age of 65, at which point the life expectancy becomes 84.3 years of age (i.e., people turning 65 in 2013 could expect to live an additional 19.3 years) (National Center for Vital Statistics, 2015).

A related concept is **health expectancy**, which is the number of years a person could expect to live in good health and with relatively little disability if current mortality and morbidity rates persist. The ideal situation in a given society is that individuals have both long health and life

expectancy, meaning that they are able to be productive and free of chronic illness until close to the time that they die. This is also called **compression of morbidity**, meaning that the illness burden to a society can be reduced if people become disabled closer to the time of their death (Vita, Terry, Hubert, & Fries, 1998).

Geographic Variations Within the United States. As you can see from Figure 1.8, the over-65 population of the United States population is very unevenly distributed geographically. As of 2013, slightly over one half of persons 65 and over lived in 13 states. With 4.8 million people 65 and older, California has the largest number of older adults, but because the state's population is so large, this age group constitutes a relatively small proportion (12.5%) of the population. As you may have guessed, Florida has the highest percentage of people 65 and older (18.7%). The greatest increases in percentage of aging population between the years 2003 to 2013 occurred in the states of Alaska (61.7%), Nevada (50.7%), and Colorado (46.8%) (Administration on Aging, 2015).

FIGURE 1.8

Persons 65+ as a Percentage of Total Population, U.S., 2014

Percent of Persons 65+ in 2010
by State

■	18.7% to 14.0% (33)
▨	13.9% to 13.3% (11)
▨	12.5% to 12.3% (2)
▨	12.0% to 11.2% (3)
▨	9.8% to 9.0% (2)
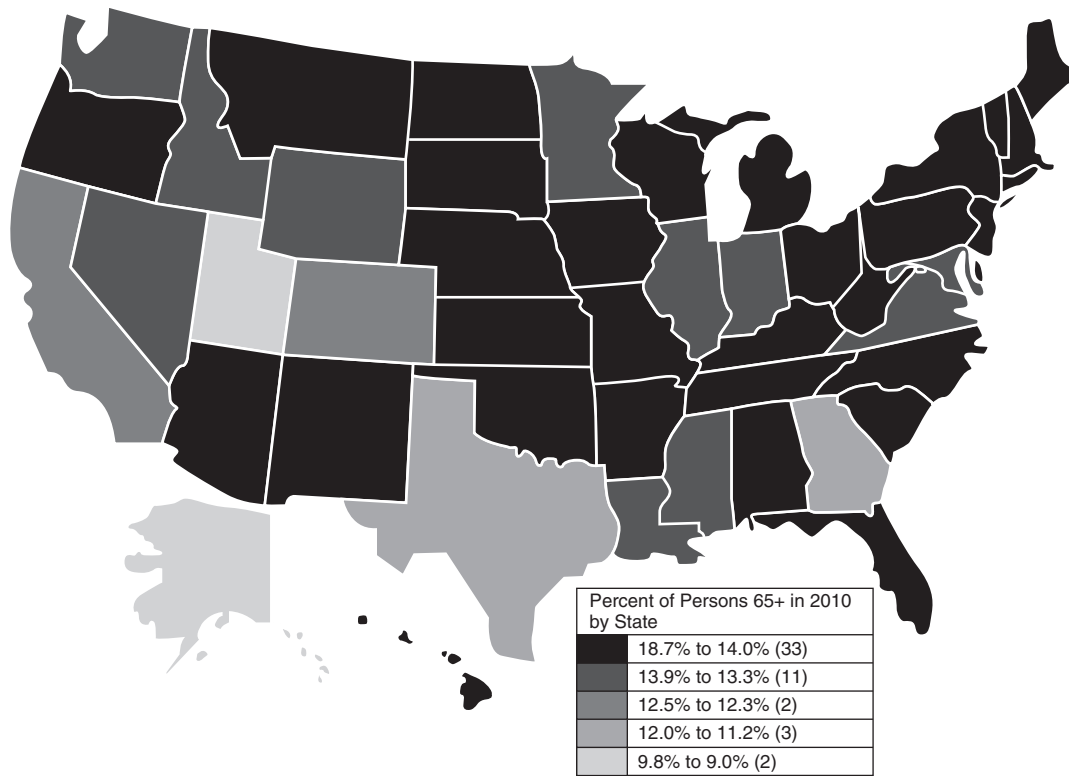
Source: Administration on Aging. (2015). A profile of older Americans: 2014. Retrieved from
http://www.aoa.acl.gov/Aging_Statistics/Profile/2014/docs/2014-Profile.pdf

Gender and Racial Variations in the Over-65 Population. Women over the age of 65 currently outnumber men, amounting to approximately 56% of the total over-65 population. This gender disparity is expected to diminish somewhat by the year 2050 as the last of the Baby Boomers reach advanced old age. At that time, 55% of the 65 and older population in the United States will be female (U.S. Bureau of the Census, 2015a).

Changes are also evident in the distribution of White and minority segments of the population. In 2013, 21.2% of all persons in the United States 65 and older were members of racial or ethnic minority populations; persons of Hispanic origin represented 7.5% (Administration on Aging, 2015). Between 2012 and 2050, there will be dramatic shifts in the racial/ethnic distribution of the 65 and older population of the United States. As shown in Figure 1.9, the percentage of those 65 and older who are non-minority (shown as "White") will decrease from 86% to 77%; correspondingly, all other racial and ethnic

groups will increase. People of Hispanic origin will show the largest overall increase across this period, from 7.3% to 18.4% (Ortman et al., 2015).

Aging Around the World

Data from around the world confirm the picture of an increasingly older population throughout the 21st century. In 2015, the U.S. government estimates that there were 616 million people worldwide over the age of 65. Predictions suggest that this number will triple to 1.57 billion by the year 2050. China currently has the largest number of older adults (137 million), but Japan has the highest percentage of people 65 and older (27%); (U.S. Bureau of the Census, 2010b; U.S. Bureau of the Census, 2015b).

World population statistics are often reported in terms of "developed" and "developing" countries. Developed countries include all those in Europe, North America, Japan, Australia, and New Zealand, plus some nations

FIGURE 1.9

Population Age 65 and Over, by Race and Hispanic Origin, 2008 and Projected 2050
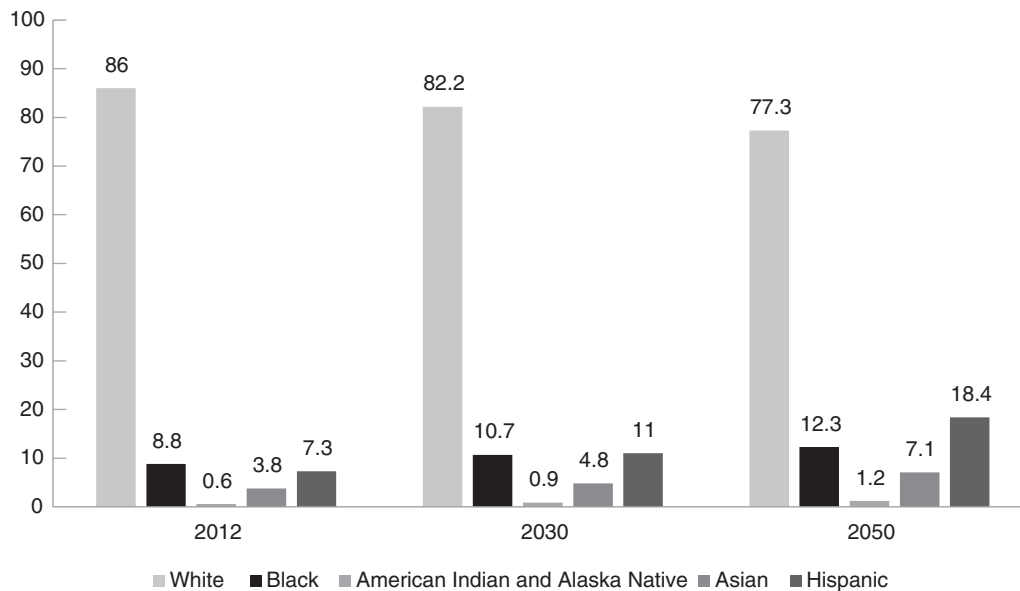
Note: Percentages do not add up to 100% within each year shown due to overlap of racial and ethnic categories, taking Hispanic origin into account.

Source: Federal Interagency Forum on Age-Related Statistics (2012). *Older Americans 2010: Key Indicators of Well-Being*. Washington, DC: Federal Interagency Forum on Age-Related Statistics.

formerly in the Soviet Union. All other nations of the world are classified as developing (Kinsella & He, 2009). The developing countries are those that have an agrarian-based economy, typically with lower levels of health care, education, and income.

The population worldwide is aging at disproportionate rates within the developed and developing nations. Figure 1.10 includes the 60 and older population and shows the dramatic rise within developing nations in the century from 1950 to 2050 (United Nations Population Fund, 2012). The rise in the developing nations will particularly outpace that of the developed nations among those 80 years and older. By 2050, China will have 90 million people 80 years and older, and India will overtake the United States as having the second highest number of people in their 80s and older (37 million). Indonesia and Mexico will join the list of countries with the highest population of 80-year-olds and up. There will be an astonishing 3.4 million people 100 years and older by 2050, and 20.1 million by 2100 (United Nations, Department of Economic and Social Affairs, Population Division, 2013).

The larger proportion of the aging population in the world will place a strain on the economies and health care systems of all nations but particularly developing nations (Kinsella & He, 2009).

What are the implications of these figures for your future as you enter into and move through your adult years? First, you will likely have more friends and associates than the current older population does, simply because there will be more peers of your age group to socialize with. If you are male, the news is encouraging; you will be more likely to live into old age compared to the current cohorts of older adults. For those of you who are younger than the Baby Boomers, the statistics are also encouraging if you are considering a career related to the field of aging, given the higher number of older clientele. Changes in various aspects of lifestyle can also be expected in the next decades, as adjustments to the aging population in the entertainment world and media are made. Just as society is getting used to the idea of an aging Paul McCartney, many others will follow in his footsteps to change views about prominent celebrities in Western society and, indeed, around the world.

FIGURE 1.10

Number of People Aged 60 and Older: World, Developed, and Developing Countries, 1950–2050
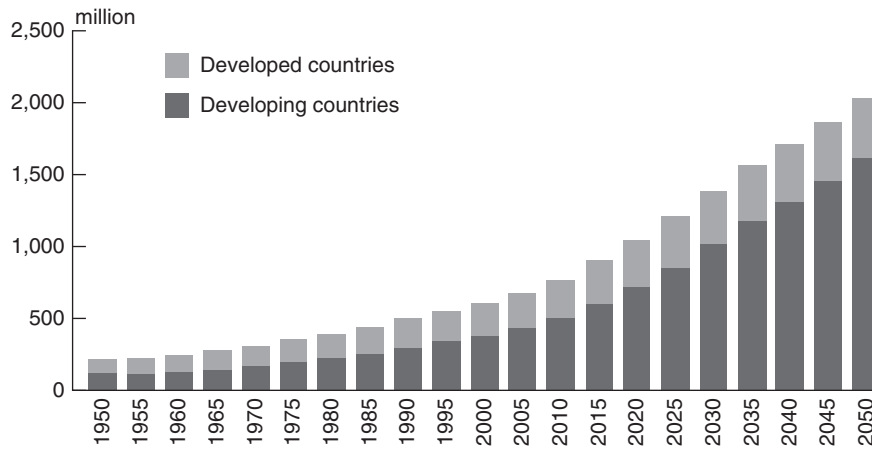
Source: UNDESA, *World Population Ageing 2011* (2012; forthcoming), based on UNDESA Population Division medium projection scenario, *World Population Prospects: The 2010 Revision*.

Note: The group of "developed countries" corresponds to the "more developed regions" of the *World Population Prospects: The 2010 Revision*, and the group "developing countries" corresponds to the "less developed regions" of the same publication.

SUMMARY

1. This book uses the biopsychosocial perspective, which regards development as a complex interaction of biological, psychological, and social processes. The four principles of adult development and aging include the assumptions that changes are continuous over the life span; only the survivors grow old; individual differences are important to recognize; and "normal" aging is different from disease. Distinctions must be drawn between primary aging (changes that are intrinsic to the aging process) and secondary aging (changes due to disease).

2. It is difficult to define the term "adult" given the range of possible criteria. For purposes of this book, we will consider the ages of 18–22 to serve as a rough guideline. The over-65 population is generally divided into the subcategories of young-old (65–74), old-old (75–84), and oldest-old (85 and over). Centenarians include individuals 100 and older, and supercentenarians are those 110 and older. These divisions have important policy implications as well as highlight the need to make distinctions among individuals over 65.

3. The idea of functional age bases age on performance rather than chronological age. Additionally, biological,

psychological, and social age all provide alternative perspectives to describe an individual. Whereas personal aging refers to changes within the individual over time, social aging refers to the effects of exposure to a changing environment and includes normative age-graded influences, normative history-graded influences, and nonnormative influences.

4. Social factors important to the study of adult development and aging include gender, race, ethnicity, socioeconomic status, and religion.

5. Society will experience a great impact as the Baby Boom generation begins to enter older adulthood. 47.8 million Americans are over the age of 65, constituting 14.9% of the total U.S. population; these numbers are expected to rise dramatically in the coming years as a result of the Baby Boomers. Gender and racial variations are also expected to change. Countries around the world will show increases in the over-65 population as well, particularly among developing countries. These changes will impact the way in which you view your own later adulthood, as well as prepare for what will happen in your later years.

2

Models of Development: Nature and Nurture in Adulthood

The Information Age

Ever think about how older adults are portrayed online? Most likely not. However, a growing body of psychologists and sociologists are, and have set out to determine if negative age stereotypes exist. Based on the premise that the media shapes our views on aging, it seems likely that the online images (whether good or bad) of middle-age and older adults impact our opinions. Ageism, as we'll cover in this chapter, is stereotyping and discrimination made on the basis of age which impacts both the young and old. In particular, younger adults with limited interaction with older adults may form opinions solely based on electronic and social media. Exposure to ageist views while young may make people more likely to continue these beliefs throughout their lifetime. If the majority of online and digital images are negative, it may not bode well for current and future generations of older adults.

One group of researchers examined Facebook groups geared toward older adults (Levy et al., 2014) to determine whether ageism was present. In all, they looked at 84 groups (whose collective membership totaled over 25,000) using criteria defined by the researchers such as ''aged'' or ''over the hill.'' According to their analysis, they determined that the majority of groups concentrated on negative aspects of aging. Topics of the groups focused on a range of negative content including banning older adults from certain activities (such as driving and shopping), physical and cognitive deficits, and comparing older adults to children (a practice we'll discuss later in the book). Of interest: the majority of group creators were between age 20 and 29. One may wonder why people in this age group have such hang-ups about older adults!

What type of impact does online ageism have on the way younger adults treat older ones? Research suggests that ageism affects self-esteem and behavior, and can lead to self-fulfilling prophecies in which the targeted adults believe the stereotypes. Repeated exposure to online dialogue and images may be particularly detrimental, as the Internet affords anonymity, potentially making the ageist remarks more damaging. Given the relative infancy of social media and the increase in older adult membership, perhaps we'll see a shift from negative (and untrue!) depictions of older adults to accurate representations that will increase understanding across all age groups.

The study of adult development and aging has evolved from the field of developmental psychology to incorporate the years beyond childhood and adolescence into a unified view of the life span. For many years, the field of developmental psychology was synonymous with the field of child development. Starting in the 1960s, several influential theorists determined that the emphasis in the field should extend through the entire life span. They argued that designating a point when people stopped developing did not make sense because people do not stop growing and changing once they reach full maturity. Although there are still theorists and researchers in developmental psychology who retain an emphasis on the early years, the emphasis in the field is increasingly coming to embrace the middle and later years of life. Based in part on the shifting demographics of the world, this expanded view is reflected in a higher number of programs that train future developmentalists.

KEY CONCEPTS IN THE STUDY OF THE LIFE SPAN

Reflecting the expanded view of developmental psychology beyond the early years of life, the term **developmental science** emerged in the 1960s to promote a more integrative, life-span view of individual growth and change (Magnusson, 1996). The use of the term "science" rather than "psychology" additionally conveys a shift from focusing solely on what happens to the individual over time to understanding the systematic effects of multiple influences that all play a role in the developmental process.

Developmental scientists look, then, at the multiple intersecting factors that impact change. Figure 2.1 highlights the two assumptions fundamental to the field. First, as we discussed in Chapter 1, personal and social aging interact. This means that to understand development, we have to go beyond the unit of the individual and look at social context. **Contextual influences on development** include sex, race, ethnicity, social class, income,

religion, and culture. For decades, developmental psychologists debated whether changes in life occurred primarily due to nature or nurture; however, researchers now consider both nature *and* nurture as influences on life-span change.

Second, taking a **life-span** perspective means that, again as we discussed in Chapter 1, people develop continuously over time rather than in a series of stages. We cannot isolate one period of time and examine it separately from those that precede and those that follow.

Another key feature of developmental science is it goes beyond psychological domains such as cognition and personality, but instead examines areas of functioning traditionally used in other disciplines relevant to behavior such as biology, health, and sociology. The inclusion of social context implies that it is not sufficient to look only within the individual's immediate environment in order to understand change over time (Ford & Lerner, 1992). Particularly important to the field of developmental science is a desire to understand the dynamic interactions among and within each level of analysis of change, from the biological to the social (Lerner, 1996).

With the refocus toward developmental science, researchers now attempt to explain the underlying processes of development rather than simply use a descriptive approach to catalog the changes over time that occur as people get older. The descriptive approach to development was practiced for many decades as scholars attempted to establish the ages at which particular events occur within the individual. It is important to catalog behaviors as these change over time, but the scientific approach requires, additionally, explanations of the "how's," not just the "what's." a series of very popular but somewhat misguided. Developmental scientists are attempting to discover orderly principles underlying growth through life: the "whys," not just the "whats."

Developmental science is also increasingly relying on advances in the field of neuroscience, or the study of brain-behavior relationships. Researchers in developmental neuroscience use brain scanning methods to correlate changes in the structures of the nervous system with changes in behavior from birth through later life. They also draw from research on species other than humans in which experimental methods can be used to manipulate both genes and the environment in ways that are not possible with humans.

The growth of the life-span approach to development was also spurred on by advances in gerontology. Distinct from **geriatrics**, which is the medical specialty in aging, gerontology is an interdisciplinary field that draws from biology, sociology, anthropology, the humanities, and other behavioral and social sciences.

FIGURE 2.1

Basic Principles of Developmental Science
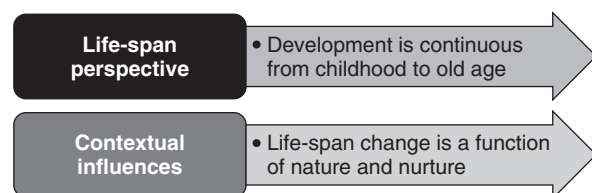
In summary, the emerging role of developmental science suggests that individuals continue to grow and change over the entire course of their lives. Additionally, developmental scientists believe that it is important to consider multiple influences, particularly the way in which social context influences change over time.

MODELS OF INDIVIDUAL–ENVIRONMENT INTERACTIONS

What causes people to change over time? We know that nature and nurture influence the individual's growth, but how much can we attribute to nature and how much to nurture? When you think about your own development, do you tend to say you must have your mother's this or your father's that? Or do you connect your current behaviors with the city or town you grew up in, what your friends were like, and where you went to school? Questions such as these fall into the category of individual–environment interactions in development. Just as you think about the causes of your own behavior, so do developmental scientists.

Early in the 20th century, developmental psychologists took a largely "nature" approach. They regarded growth in childhood as a clocklike process that reflected the unfolding of the individual's genetic makeup. This was the assumption of early 20th-century writers such as Arnold Gesell (1880–1961), who took on the task of chronicling a child's changes from birth to adolescence. According to these early developmental theorists, such changes reflected the influence of ontogenesis, or maturational processes, as they unfolded within the child. Early scholars such as Gesell gave minimal emphasis to the environment. They believed that parents needed to provide the right growing conditions, much as you would provide water and light to a plant seedling. Other than that, the child's genes would dictate the pace and outcome of development.

Challenging the nature position was the founder of American behaviorism, John B. Watson (1878–1958). Writing some 20 years after Gesell, Watson took the extreme "nurture" position that a child's development was entirely dependent on the environment the parents provided. Similarly, the behaviorist B.F. Skinner (1904–1990) believed that development consisted of the acquisition of a series of increasingly complex habits reflecting the child's exposure to new experiences.

The nature–nurture debate stimulated many of the classic studies in child development. Researchers from the opposing viewpoints attempted to prove their positions by contrasting, for example, differences between identical twins reared together and those reared in separate homes. The theory behind these studies was that since identical twins shared 100% of their genetic material, any differences between those reared apart would be due to the environment in which they grew up.

Perhaps the most hotly debated of these discussions was the issue of whether intelligence is inherited or acquired. The debates took on a different tone as researchers understood more and more that neither influence alone could account for individual differences in performance on intelligence tests—in children or adults. One contribution that

Age fotostock/SUPERSTOCK

These young girls are expressing an interest in dance, which will become their ''niche'' as they continue to develop further their interests and abilities.

changed the tone of the nature–nurture debate occurred when developmental psychologist Sandra Scarr introduced the concept of **niche-picking** (Scarr & McCartney, 1983), the proposal that genetic and environmental factors work together to influence the direction of a child's life. According to this concept, children quite literally pick out their "niche," or area in which they develop their talents and abilities. Once they start down that particular pathway, they experience further changes that influence the later development of those particular abilities.

Consider the example of a child whose genetic potential predisposes her to be a talented dancer. She has a great deal of flexibility, poise, and a good sense of rhythm—all characteristics that reflect strong "dance" genes. At the age of 4, her parents take her to a ballet performance. She sits glued to her seat, fascinated by the pirouetting and leaping of the performers who she sees on stage. This event triggers pleas to her parents to enroll her in ballet lessons, and soon they do. The child has chosen dancing as her "niche," having been exposed to the ballet performance, and once allowed to pursue her talent, she continues to thrive. Thus, her "dance genes" lead her to develop an interest in exactly the activity that will allow her talents to flourish. Similarly, had she possessed strong athletic abilities, she would have pursued a game such as soccer or field hockey that, in turn, would have given her the niche in which to develop those strengths.

There are three prominent models in developmental science, each gives differing emphasis to genetics, the environment, and the interaction of the two (Lerner, 1995). In Table 2.1, we summarize the essential elements of these models.

Armed with the basic information we've covered so far, ask yourself once again where you think you come out on the nature–nurture–interactionist debate. If you're on the side of genetics, you agree with the **organismic model** (taken from the term "organism"), which proposes that heredity drives the course of development throughout life. Changes over time occur because the individual is programmed to exhibit certain behaviors at certain ages with distinct differences between stages of life.

In contrast, the **mechanistic model** of development (taken from the word "machine") proposes that people's behavior changes gradually over time, shaped by the outside forces that cause them to adapt to their environments. Developmental scientists working from the mechanistic model propose that growth throughout life occurs by exposure to experiences that present new learning opportunities. Because this exposure is gradual, the model assumes that there are no clear-cut or identifiable stages. Instead, development is a smooth, continuous set of gradations as the individual acquires new experiences.

The **interactionist model** takes the view that not only do genetics and environment interact in complex ways to produce their effects on the individual but that individuals actively shape their own development. This model is most similar to niche-picking because it proposes that you can be shaped by and, in turn shape, your own environments.

With increasing evidence from studies showing that genetics and environmental influences on development in fact interact with one another, the interactionist model is gaining traction. A related concept is also becoming increasingly accepted: that individuals can alter not only the nature of their interactions with the environment but also the rate and direction of the changes associated with the aging process. According to the principle of **plasticity in development**, the course of development may be altered (is "plastic"), depending on the nature of the individual's specific interactions in the environment. The type of interactions most likely to foster plasticity involve active interventions such as mental and physical exercise. Other ways to promote plasticity include taking steps to prevent causing harm to their bodies by avoiding, as much as possible, engaging in risky behaviors.

With this framework in mind, you will be able to place each theory of development into perspective. Theories proposing that development is the result of ontogenetic changes fall within the organismic model. Learning theory,

TABLE 2.1
Models of Individual–Environment Interactions

	Organismic	*Mechanistic*	*Interactionist*
Nature of change	Qualitative	Quantitative	Multidirectional Multidimensional
Contribution of organism	Active	Passive	Active
Main force in development	Biological (intrinsic)	External (environmental)	Reciprocal

Source: Adapted from Lerner, R. M. (1995). Developing individuals within changing contexts: Implications of developmental contextualism for human development, research, policy, and programs. In T. J. Kindermann & J. Valsiner (Eds.), *Development of person-context relations* (pp. 13–37). Hillsdale, NJ: Lawrence Erlbaum.

which proposes that development proceeds according to environmental influences, is categorized into the mechanistic model. Theories that regard development as the product of joint influences fit within the interactionist model. Clearly, the biopsychosocial perspective falls within the interactionist model of development because it considers multiple influences on development and views the individual as an active contributor to change throughout life.

We have already discussed the need to examine the aging process from a multidimensional point of view and along with this notion is the idea that development can proceed in multiple dimensions across life. The concept of plasticity fits very well with the notion of compensation and modifiability of the aging process through actions taken by the individual, a concept that we will continue to explore throughout this book. From our point of view, the interactionist model provides an excellent backdrop for the biopsychosocial perspective and a basis for viewing the processes of development in later life on a continuum with developmental processes in the early years.

Reciprocity in Development

You can see that an important assumption of the interactionist model is that individuals are products of their experiences. Additionally, this model implies that individuals also shape their own experiences, both through active interpretation of the events that happen to them and through the actions they take. We would like to explore this idea now because it is so fundamental to the principles we articulate throughout the text.

The concept of **reciprocity in development** states that people both influence and are influenced by the events in their lives (Bronfenbrenner & Ceci, 1994). This model, then, explicitly proposes that not only are you shaped by your experiences but that you in turn shape many of the experiences that affect you.

Consider the reciprocal process as it has affected your own life. You were influenced by earlier events to choose a particular course that has brought you to where you are right now. Perhaps you and your best friend from high school decided to apply to the same college, and as a result you are at this college and not another one. Perhaps you chose this college because you knew you wanted to major in psychology and you were impressed by the reputation of the faculty in your department. Or perhaps your choice was made randomly, and you are unsure of what exactly led to your being in this place at this time. In any case, you are where you are, having been influenced one way or another by your prior life events. That is one piece of the reciprocal process.

The second piece of the reciprocity puzzle relates to the effect you have on your environment; this in turn will affect subsequent events in your life. For example, by virtue of your existence, you affect the people who know you, your "life footprint," as it were. It is not only very possible but very likely that their lives may have already been altered by their relationship with you.

Indeed, your impact as a student at your college may have lasting effect on both you and your institution. Everyone knows of great student athletes, scholars, or musicians who bring renown to their institutions. Even if you don't become a famous alum, your contributions to the school may alter it nevertheless. Have you ever asked a question in class that may have taken your professor by surprise? Perhaps, as a result, you may have permanently altered the way that professor approaches the problem in the future. It is not improbable to imagine that your question stimulates your professor to investigate a new research question. The investigation may ultimately produce new knowledge in the field, changing it permanently by virtue of this new knowledge.

Though you may not become the source of groundbreaking research by one of your professors, you may nevertheless influence the people around you in much smaller ways that lead to important changes. Some of these influences may be good ones, as when you express kindness to a stranger who in turn has reason to smile, and for that instant, feels a bit better about the world. Others may prove disastrous, as when a single wrong turn while you are behind the wheel has the unfortunate effect of causing an accident that injures your passengers or those in other vehicles. In a split second, any person can influence others for better or worse, forever changing the course of someone's life.

To sum up, the reciprocal process takes as a basic assumption the idea that people are not passive recipients of environmental effects. Instead, choices and behaviors that each and every one of us makes leave a mark on the world. Subsequently, the changes in that environment may further alter people in significant ways, which leads to further impacts on society. Reciprocal views of development regard these continuing processes as both ongoing and, to some extent, unpredictable.

SOCIOCULTURAL MODELS OF DEVELOPMENT

The models of development we have just examined set the stage for looking in greater depth at particular theoretical approaches to adult development and aging. We begin by focusing on those approaches that give relatively

more emphasis to the environment as an influence on development.

Ecological Perspective

The **ecological perspective**, proposed by pioneering developmental scientist Urie Bronfenbrenner (1994), identifies multiple levels of the environment as they affect the individuals over time. As shown in Figure 2.2, the ecological perspective defines five levels of the environment or "systems," all of which interact in their influence on the individual. You are aware of some of these influences, but the further you go out from the center, the less likely you are to have direct experiences with those systems (Swick & Williams, 2006).

Rather than see these as static circles, imagine them as having the ability to interact fluidly and in multiple directions. The individual is shown here at the center. In keeping with the reciprocity principle, though, keep in mind that you are affected by the outer rings but can

also have influence on each of them, to varying degrees. Closest to the individual is the **microsystem**, the setting in which people have their daily interactions and which therefore have the most direct impact on their lives. The **mesosystem** is the realm of the environment in which interactions take place among two or more microsystems. For example, you may be having difficulties at home that you carry over into your relationships with co-workers. The **exosystem** includes the environments that people do not closely experience on a regular basis but that impact them nevertheless. These environments include such institutions as the workplace and community centers as well as extended family, whom you may not see very often. The **macrosystem** includes the larger social institutions ranging from a country's economy to its laws and social norms. The macrosystem influences the individual indirectly through the exosystem.

All of these systems interact over time. The **chronosystem** refers to the changes that take place over time. The interacting systems within the ecological model are affected
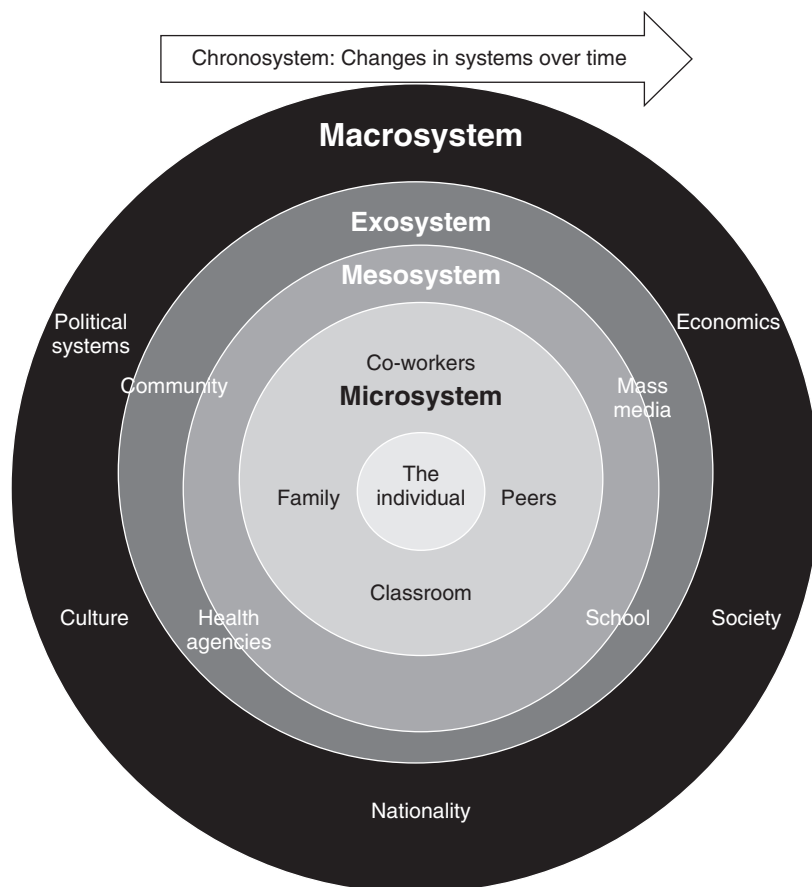
FIGURE 2.2

Bronfenbrenner's Ecological Perspective

According to Bronfenbrenner's ecological perspective, our development is affected by processes at multiple levels.

by historical changes. These can include events within the family, for example, as well as events in the larger society that indirectly affect the individual by affecting the macrosystem.

Now that you have seen the different levels of the ecological model, you can experiment in your mind with ways that they interact. Consider a situation perhaps close to your own right now. Many college students in the United States, at least as of 2015, are forced to take out student loans. They graduate with significant debt, affecting their well-being for years to come. If the government either provided more funding for higher education, or at least debt service relief, students would not be burdened with so much debt.

You could, alternatively, influence the outer ring of the ecological system by speaking out against student debt. You could organize a movement on your campus to lobby for student loan forgiveness. Perhaps you are able to bend the ear of a legislator who, in turn, proposes new laws that lead to student debt relief. Individuals who bring about broad social changes exemplify how reciprocity can work at all levels. On a smaller scale, however, as we showed before, you can also influence those around you in more direct and immediate ways.

The ecological model can also apply to such areas as health. Although you may typically think of your overall health as functioning within your inner biological level, researchers working within the Whitehall II study have demonstrated the significance of relations with others' health. In one study, participants who reported negative characteristics of close relationships had a higher likelihood of being overweight (Kuovonen et al., 2011). Social support from a relationship identified as the closest related to physical activity, even after controlling for factors such as physical functioning and self-rated health. In Figure 2.3, we show another example of the impact of the environment on health, also from Whitehall II. As can be seen from this figure, scores on physical functioning were lower among men and women in Whitehall II from lower employment grades.

The Life Course Perspective

The ecological model's emphasis on social context provides an excellent background for understanding a concept central to social gerontology. According to the **life course perspective**, norms, roles, and attitudes about age have an impact on the shape of each person's life (Settersten, 2006). It's important to recognize, right at the start, that the term life "course" is not the same as life span. The life "course" refers, literally, to the course or progression of a person's life events. This course is theorized to be heavily shaped by society's views of what is appropriate and expected to occur in connection with particular ages.

Within the life course perspective, specific theories attempt to link society's structures to the adaptation, satisfaction, and well-being of the people who live in that society. Social gerontology focuses on age as the primary structure that influences an individual's quality of adaptation. Social class, family roles, and work are additional areas of study by gerontologists studying the life course.

Related to the concept of the life course is the **social clock**, the expectations for the ages at which a society associates with major life events (Hagestad & Neugarten, 1985). These expectations set the pace for how people think they should progress through their family and work timelines. People evaluate themselves according to these expectations, deciding whether they are "on-time" or "off-time" with regard to the social clock. Those who see themselves as off-time may feel that they've failed, especially when they are criticized by others who expect people to follow the normative prescriptions for their age group. In this
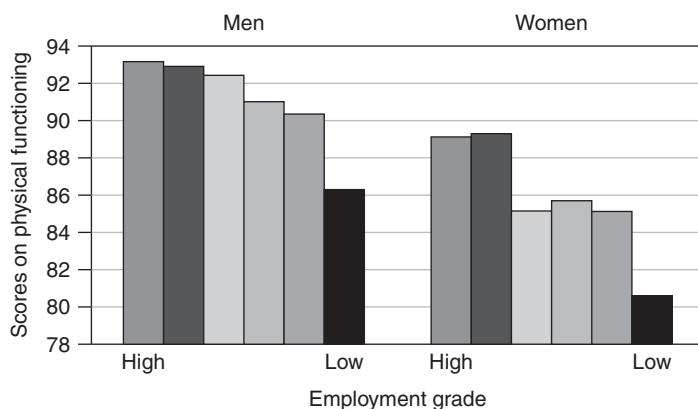
FIGURE 2.3

Effect of Social Class on Physical Functioning

Stephen Schildbach/Photodisc/Getty Images, Inc.

For many people, the social clock provides a measure of evaluating their life's successes.

sense, the "nonevents" of life, those that don't happen but are believed to be normative, may have as much of an influence on an individual's life as actual events.

Increasingly, however, individuals are setting their own unique social clocks with one of the most famous being former astronaut and Ohio senator John Glenn. At the age of 77, Glenn joined the space shuttle *Discovery* crew on a 9-day orbital mission in 1998. His ability to meet the arduous physical requirements of the voyage was aptly captured in his statement: "Too many people, when they get old, think that they have to live by the calendar." More recently, actress Betty White (now age 93), challenged the views that older women need to be staid and serious with her performances in comedic roles on television and in the movies.

Not only is age linked to the social clock, but also to people's social roles, the resources available to them, and the way they are treated by those with whom they interact. One of the guiding frameworks regarding age and role satisfaction is **activity theory**, the view that older adults are most satisfied if they are able to remain involved in their social roles (Cavan, Burgess, Havighurst, & Goldhamer, 1949). If forced to give up their roles, according to this view they will lose a major source of identity as well as their social connections. According to activity theory, older adults should be given as many opportunities as possible to be engaged in their work, families, and community.

A contrasting perspective to activity theory is **disengagement theory** (Cumming & Henry, 1961), which proposed that the normal and natural evolution of life causes older adults to loosen purposefully their social ties. This natural detachment, according to disengagement theory, is not only inevitable but also desirable. Aging, furthermore, is accompanied by a mutual withdrawal process of the individual and society that is sought after, and favorable to, the older person. It follows from disengagement theory that retirement and isolation from family members are sought out by older adults and result in higher levels of well-being.

When first proposed in the early 1960s, gerontologists were highly skeptical if not outraged by the propositions of disengagement theory. The idea that older adults wanted to be put "on the shelf" and could even benefit from social isolation only reinforced negative treatment of older adults by society. Rather than describing a desirable end product of a mutual withdrawal process, critics of disengagement theory regarded it as disrespectful of older adults and as a justification for what is already harsh treatment by society of its older adult members, as you will learn more about in the next section.

Yet, it makes sense that not all older adults wish to be as active and involved in their work, family, and community as they were when they were younger. **Continuity theory** (Atchley, 1989) proposes that whether disengagement or activity is beneficial to the older adult depends on the individual's personality. Some older adults prefer to withdraw from active involvement with their families and communities; others are miserable unless they are in the thick of the action. Either forced retirement or forced activity will cause poorer adjustment and self-esteem in middle-aged and older adults than finding the amount of involvement that is "just right."

Ageism as a Social Factor in the Aging Process

The social context in which aging occurs is, unfortunately, one that is not necessarily favorable to the overall well-being of older adults. Many are affected by **ageism**, a set of beliefs, attitudes, social institutions, and acts that denigrate individuals or groups based on their chronological age. Similar to other "isms" such as racism and sexism, ageism occurs when an individual is assumed to possess a set of stereotyped traits.

Ageism can apply to anyone, regardless of age. Teenagers are often stereotyped as lazy, impulsive, rebellious, and self-centered. However, for all practical purposes, ageism is used to refer to stereotyped views of the *older adult* population. Disengagement theory was

Maggie Kuhn (1905–1995), founder of the ''Gray Panthers,'' whose grassroots activities protested against ageism in public and governmental policies, including age discrimination, pension rights, and nursing home reform.

thought of by its critics as a justification for ageism, as a way to move older people conveniently, and with justification, to the backdrop of society. Moreover, by implying that all older adults have the same drive to withdraw, the theory perpetuates the stereotype that all older adults have similar personalities.

The primarily negative feature of ageism is that, like other stereotypes, it is founded on overgeneralizations about individuals based on a set of characteristics that have negative social meaning. Ageism applies to any view of older adults as having a set of characteristics, good or bad, that are the same for everyone. Even though ageism may have a positive spin (Kite & Wagner, 2002), its overall thrust is negative. Calling an older adult "cute" or "with it" is as much an expression of ageism as is referring to that person as "cranky" or "senile."

One effect of ageism is to cause younger people to avoid close proximity to an older person. In fact, ageism may also take the form of not being openly hostile but of making older adults "invisible": that is, not worthy of any attention at all. Ageism is often experienced in the workplace, and although prohibited by law (a topic explored in Chapter 10), older workers are penalized for making mistakes that would not incur the same consequence if made by younger workers (Rupp, Vodanovich, & Crede, 2006).

Ironically, aging is the one stereotype that, if you are fortunate enough to survive to old age, you will most likely experience. Unlike the other "isms," people who hold aging stereotypes will eventually become the target of their own negative beliefs as they grow old. What are your stereotypes about aging? Table 2.2 shows the most common stereotypes, along with refutations by the World Health Organization with examples from around the world of older adults who defy these stereotypes.

Research on college students shows that the ones most likely to harbor ageist attitudes are those who identify most strongly with their own age group (Packer & Chasteen, 2006). In other words, the more likely you are to think of yourself as a teen or twenty-something, the more likely you'll hold biased views of older adults. As a result of taking this course, however, we hope you will gain knowledge that will cause you to challenge your own stereotypes about aging and older adults.

Why does ageism exist? Of the many possible causes, perhaps at the root is that older adults remind us of the inevitability of our own mortality (Martens, Greenberg, Schimel, & Landau, 2004). According to **terror management theory**, people regard with panic and dread the thought that their lives will someday come to an end (Solomon, 1991). They engage in defensive mechanisms to protect themselves from the anxiety and threats to self-esteem that this awareness produces. Younger people therefore unconsciously wish to distance themselves as much as possible from older adults. Having acquired ageist attitudes when younger, older adults themselves may express ageist beliefs because they wish to distance themselves from what they have come to learn is a devalued social identity (Bodner, 2009).

An alternative perspective, advanced by sociologists, is that older adults are seen negatively because they have lost their utility to society. According to the **modernization hypothesis**, the increasing urbanization and industrialization of Western society is what causes to be older adults to be devalued (Cowgill & Holmes, 1972). They can no longer produce, so they become irrelevant and even a drain on the younger population.

Some sociologists argue that the modernization hypothesis is overly simplistic (Luborsky & McMullen, 1999). For example, in the United States, even when life expectancy was lower and there were fewer older adults in the population, attitudes toward age were not consistently positive (Achenbaum, 1978). Evidence for negative attitudes toward elders is also found in current preindustrialized societies. Conversely, in some highly developed countries, older adults are treated with reverence and respect and are well provided for through health care and economic security programs. Modernization alone does not seem able, then, to account for ageism.

Whatever its cause, older adults must nevertheless cope with ageist attitudes. Many too must cope with other "isms" that affect the way they are regarded in society. According

TABLE 2.2

Fighting Stereotypes about Aging

Stereotype	*Counter-evidence*	*Example*
Older people are "past their sell-by date"	Most individuals maintain cognitive abilities well into later life. Older adults possess experience and institutional memory. Physical declines are much less than expected.	On October 16, 2011, British national Fauja Singh became the first 100-year-old to complete a marathon by running the Waterfront Marathon in Toronto, Canada.
Older people are helpless	Older people may be vulnerable in emergencies, but in general they are not helpless.	After the 2007 Cyclone Sidr in Bangladesh, older adults served in active roles to help survivors. In 2011, after the earthquake and tsunami in Japan, older adults volunteered at disaster sites, saying they were not afraid of becoming contaminated with radiation.
Older people will eventually become "senile"	Occasional memory lapses occur at any age. Although dementia (loss of intellectual abilities) risk increases with age, its symptoms are not normal signs of aging.	Most older adults can manage their financial affairs and everyday lives and can give informed consent for treatment or medical interventions. Some types of memory stay the same or improve in later life.
Older women have less value than younger women	Women's roles as caregivers are often overlooked because society equates a woman's worth with beauty, youth, and the ability to have children. In most countries, women tend to be the family caregivers. Many, including those of advanced age, take care of more than one generation.	In sub-Saharan Africa, 20% of rural women aged 60 and older are the main carers for their grandchildren.
Older people don't deserve health care	Conditions and illnesses in older adults are often overlooked as being a "normal" part of aging but they are not. Age does not necessarily cause pain and only extreme old age is associated with limited bodily functions.	80-year-old Simeon from Moldova is a counselor for war veterans, providing social, legal, and health advice and support for them, informing them of the rules and their rights.

Source: World Health Organization. (2012) World Health Day 2012: Ageing and health. http://whqlibdoc.who.int/hq/2012/WHO_DCO_WHD_2012.1_eng.pdf

to the notion of **intersectionality**, multiple "isms" such as ageism, sexism, and racism do not just add up but interact with one another to influence the discriminatory ways in which people reflecting more than one group are treated. The **multiple jeopardy hypothesis** (Ferraro & Farmer, 1996) states that older individuals who fit more than one discriminated-against category are affected by biases against each of these categorizations. Women are subject to ageism and sexism, and minority-status women are subject to racism, ageism, and sexism. Regardless of minority status, women may also experience "lookism," in which older women (but not men) are judged as less attractive on the basis of looking older (Granleese & Sayer, 2006). Heterosexism and classism (biases against people of working class backgrounds) further add to multiple jeopardy. These systematic biases interact with age to produce greater risk for discrimination in attitudes and the provision of services to specific subgroups of older adults.

It's possible, however, that older adults are somehow protected from multiple jeopardy. The **age-as-leveler view** proposes that as people become older, age overrides all

other "isms." Older adults, whatever their prior status in life was, all become victims of the same stereotypes. Regardless of minority status, gender, or other social characteristics, all older adults are viewed with the same harshly negative views. Consider the case of a wealthy older adult male and an older lower-income minority woman. Though the man almost certainly would have enjoyed many advantages over the woman when he was younger, the age-as-leveler view proposes they are now seen as having an equally low social ranking because they are old. Therefore, there's only a single jeopardy of ageism facing older adults rather than multiple jeopardy resulting from a combination of isms.

Older adults potentially facing multiple jeopardy may also be protected from its effects and even perhaps fare better than those with higher social standing. According to the **inoculation hypothesis**, older minorities and women have managed to become immune to the effects of ageism through years of exposure to discrimination and stereotyping. These years of maltreatment help them to develop a tolerance, so that they are better able to withstand the negative attitudes applied to older adults than are their counterparts. The upper-income white male may actually find it more difficult to accept the stereotypes of ageism than does the low-income minority woman, who is used to being treated as a less desirable member of society after years of discrimination. Even so, his privileged status may have granted him more economic resources from which to draw, which in turn could buffer him from this newly acquired lower status by virtue of his age.

These perspectives of ageism become important in examining the health and well-being of older adults. Interestingly, neither ageism nor multiple jeopardy appears to have deleterious effects on feelings of happiness and well-being, a topic we explore in Chapter 14. However, the effects of less access to health care and exposure to negative views of aging on those who are subjected to the "isms" may take their toll on physical health and are therefore a matter of vital concern.

PSYCHOLOGICAL MODELS OF DEVELOPMENT IN ADULTHOOD

In the broadest sense, psychological models attempt to explain the development of the "person" in the person–environment equation from the standpoint of how adaptive abilities unfold over the course of life. Psychologists approach aging by focusing on the changes that occur over time in the individual's self-understanding, ability to adjust to life's challenges, and perspective on the world.

Erikson's Psychosocial Theory

According to developmental psychologist Erik Erikson (1963), people pass through a series of eight stages as they progress from birth through death. A psychoanalyst by training, Erikson attempted to understand how people navigate the major life issues that they face when they encounter each of life's new challenges.

Erikson's **psychosocial theory of development** proposes that at certain points in life, biological, psychological, and social changes come together to influence the individual's personality. He defined each stage of development as a "crisis" or turning point that influences how people resolve the issues they face in a particular period in life. The "crisis" is not truly a crisis in the sense of being a catastrophe or disaster. Instead, each psychosocial stage is a time during which the individual may move closer to either a positive or negative resolution of a particular psychosocial issue. Figure 2.4 illustrates the eight-stage matrix.

Erikson maintained that these stages are universally experienced, although the way in which individuals negotiate them may vary. The **epigenetic principle** asserts that each stage unfolds from the previous stage according to a predestined order. These stages are set in much the same manner as the programming for the biological development of the individual throughout life. They are built, according to Erikson, into the hard-wiring of the human being.

The earliest four stages are central to the adult's ability to build a solid sense of self and engagement with others. **Basic trust vs. basic mistrust** involves the infant's establishing a sense of being able to rely on care from the environment (and caregivers). In **autonomy vs. shame and doubt**, young children learn ways to act independently from their parents without feeling afraid that they will venture too far off on their own. In the **initiative vs. guilt** stage, the child becomes able to engage in creative self-expression without fear of making a mistake. The last stage associated with childhood, **industry vs. inferiority**, involves the individual's identifying with the world of work and developing a work ethic.

The first of the eight stages directly relevant to adulthood is **identity achievement versus identity diffusion**, when individuals must decide "who" they are and what they wish to get out of life. This stage emerges in adolescence, yet continues to hold importance throughout adulthood, forming a cornerstone of subsequent adult psychosocial crises (Erikson, Erikson, & Kivnick, 1986; Whitbourne & Connolly, 1999). An individual who achieves a clear identity has a coherent sense of purpose regarding the future and a sense of continuity with the past. By contrast, identity diffusion involves a lack of direction, vagueness about life's purposes, and an unclear sense of self.

Stage	1	2	3	4	5	6	7	8
Later adulthood								Ego integrity vs. despair
Middle adulthood							Generativity vs. stagnation	
Young adulthood						Intimacy vs. isolation		
Adolescence					Identity achievement vs. identity diffusion			
Middle childhood				Industry vs. inferiority				
Early childhood			Initiative vs. guilt					
Toddlerhood		Autonomy vs. shame doubt						
Early infancy	Basic trust vs. mistrust							

FIGURE 2.4

Stages in Erikson's Psychosocial Theory

Source: Adapted from Erikson, E. H. (1963). *Childhood and society* (2nd ed). New York: Norton.

In the **intimacy versus isolation** stage, individuals are faced with making commitments to close relationships. Attaining intimacy involves establishing a mutually satisfying close relationship with another person to whom a lifelong commitment is made. We can think of the perfect intimate relationship as the intersection of two identities; not a total overlap because each partner preserves a sense of separateness. The state of isolation represents the other end of the spectrum, in which a person never achieves true mutuality with a life partner. Theoretically, isolation is more likely to develop in individuals who lack a strong identity because in a close relationship, each partner has to "give up" a piece of his or her identity.

The motive for caring for the next generation emerges from the resolution of the intimacy psychosocial crisis. During the stage of **generativity versus stagnation**, middle-aged adults focus on the psychosocial issues of procreation, productivity, and creativity. The most common pathway to generativity is through parenthood, an endeavor that involves direct care of the next generation. However, individuals who do not have children can nevertheless develop generativity through such activities as teaching, mentoring, or supervising younger people. A career that involves producing something of value that future generations can enjoy is another form of generativity. Conversely, not all parents demonstrate a strong sense of generativity with regard to their own children. They may focus instead on other young people or prefer to invest their emotional resources on their friends or romantic partners.

The main feature of generativity is that the individual feels and shows concern over what happens to the younger generation, along with a desire to make the world a better place for them. Stagnation, by contrast, occurs when the individual turns concern and energy inward or solely to others of one's own age group rather than to the next generation. A person who is high on the quality of stagnation lacks interest or may even go so far as to reject the younger generation.

Chabruken/Taxi/Getty Images, Inc.

Mentoring is one activity associated with generativity; as shown here, this older worker is trying to give helpful advice to his younger colleague.

Toward the end of adulthood, individuals face psychosocial issues related to aging and facing their mortality, the key issues in the stage of **ego integrity versus despair**. Older individuals who establish a strong sense of ego integrity can look back at their experiences with acceptance. Ego integrity also involves an ability to look at and accept the positive and negative attributes of one's life and self, even if it may be painful for people to acknowledge their past mistakes or personal flaws. This sense of acceptance of the past and present self allows the individual also to view mortality with the acceptance that life inevitably must end.

It may be difficult for a young person to imagine how a person who is happy with life could also be happy with, or at least not devastated by, the thought of death. According to Erikson, acceptance of the past and present helps people attain acceptance about being at the end of their lives. In contrast, despair is the outcome of the individual's realization that death is coming too soon to help him or her achieve major life goals or rectify mistakes. The individual in a state of despair feels discontent with life and is melancholic, perhaps to the point of despondency, at the thought of death.

Erikson presented an organized, cohesive view of the life span that is both elegant and deceptively simple. At first glance, it might appear that he viewed development as proceeding in a series of steps moving steadily from childhood to old age. The diagonal in the matrix of ages and psychosocial issues shows how each age period is associated with a crisis. However, the intersection of ages and psychosocial issues along the diagonal is not the only possibility for development. People may experience a psychosocial issue at an age other than the one shown where it crosses the diagonal. Thus, the issues characterizing each stage (such as trust vs. mistrust for infancy) may coexist as relevant concerns throughout adulthood. Any stage may reach ascendancy in response to events that stimulate its reappearance.

Let's look at an example to show how these "off-diagonal" situations might occur. An 80-year-old woman walking on a city sidewalk is suddenly attacked, robbed of her purse, and left alive but physically injured and emotionally shaken. This incident may traumatize her for some time and in the process, she becomes fearful of leaving her home. In Eriksonian terms, she is reliving the issues of "trust" experienced in infancy and must regain the feeling of safety in her environment. The woman may also be left feeling vulnerable that with her increasing years, declines in her physical functioning have made her a target.

Another implication of the epigenetic matrix is that a crisis may be experienced before its "time." A 35-year-old woman diagnosed with breast cancer may be faced with issues relevant to mortality, precipitating her to contemplate the psychosocial issues that normally confront much older people. The crisis stages can be considered "critical periods" during which certain issues are most likely to be prominent, but they are not meant to be discrete steps that proceed from youth to old age.

Erikson's views about development were a radical departure from the personality theories prevalent in the mid-1900s, when childhood was given sole emphasis as a time of important change. By reenvisioning the life span, Erikson provided a new but enduring perspective that recognized development as a lifelong set of processes that help to mold and shape and reshape the individual.

Piaget's Cognitive-Developmental Theory

Just as Erikson crafted a new model of personality development throughout the life span, a Swiss psychologist by the name of Jean Piaget brought an entirely new perspective to bear on the process of cognitive development. Rather than being content simply with describing children's development, as his predecessors had done, Piaget tried to explain the processes underlying their growth of cognitive abilities. Stimulated in part by watching his own young children explore their environment while at play, Piaget hypothesized the existence of a set of underlying processes that

allowed them eventually to achieve understanding and mastery of the physical world.

Piaget believed that development involves continuing growth of the individual's knowledge about the world through a set of opposing, complementary processes. These processes target what Piaget called **schemas**, the mental structures we use to understand the world. Children's schemas change and mature as they explore their environment—a process that, ideally, helps them to bring their schemas increasingly in tune with reality.

Through the process that Piaget called **assimilation**, people use their existing schemas as a way to understand the world around them. In this context, the term assimilation does not have its usual meaning, as when you say that a person has become assimilated to a new culture. Rather, in Piaget's model, assimilation has the opposite meaning: it refers to the situation in which individuals change their interpretation of reality to fit the schemas they already hold. Instead of changing themselves to fit the culture, they change their perception of the culture to fit their own way of understanding it.

As an example, let's say that you have a very limited understanding of different varieties of birds. You may call all little birds "sparrows" and all large birds "crows." You are forcing into two categories what actually may be 8 or 10 different varieties of birds in your neighborhood. According to Piaget, people engage in this assimilative process until they are able to gain experiences that allow them to refine their concepts or schemas. If you go for a walk with an avid bird watcher who points out the differences among sparrows, finches, and chickadees (all small birds), you will emerge with a refinement to your previous categorization system.

When you change your schemas in response to new information about the world you are, in Piaget's terms, using the process of **accommodation**. This process is actually more like the way we commonly speak about cultural "assimilation." In Piaget's terms, when you change yourself in order to fit the larger culture that you're now a part of, you are engaging in accommodation: You are the one who is changing.

It's unfortunate that Piaget's terms mean the opposite of their use in common speech, especially the concept of assimilation. However, it might be easier to understand assimilation and accommodation in the Piagetian sense if you remember that Piaget was describing the process of schema development. You impose your schemas onto the world, making the world fit you, in assimilation. You change your schemas about the world, changing in response to knowledge from experiences, in accommodation. (If all else fails, think of the "s" in assimilation standing for "same," and the "c" in accommodation for "change.")

The processes of assimilation and accommodation occur continuously throughout development. Children are constantly exploring their worlds, changing their schemas as they accommodate them to fit the reality of their experiences. At certain points in childhood, according to Piaget, there are major shifts in children's understanding of their experiences. These correspond to the stages associated with early infancy (sensorimotor stage), preschool (preoperational period), middle childhood (concrete operations stage), and adolescence through adulthood (formal operations stage). Each stage represents a time of **equilibrium**, when assimilation and accommodation are perfectly balanced. The equilibrium achieved in formal operations is the most stable because it is when the individual is able to use the highest level of thought to understand and learn from experience. However, throughout life, people rely on all forms of thought, ranging from sensorimotor (nonverbal) to concrete (the here and now).

Identity Process Theory

As you've learned, identity is a central issue in adulthood. How identity changes is a question that we will explore throughout this book. We will rely heavily on the framework of **identity process theory** (Whitbourne, Sneed, & Skultety, 2002), which proposes that identity continues to change in adulthood in a dynamic manner.

In identity process theory, we assume that people approach their experiences from the vantage point provided by **identity**, which is the set of schemas that the person holds about the self. Your identity is your own answer to the question "Who am I?" For most people, this includes their views about their physical self, their cognitive abilities, their personality characteristics, and their social roles. Identity also includes the individual's sense of connection to his or her cultural heritage, a process of particular importance to adolescents and emerging adults from immigrant and minority groups (Rodriguez, Schwartz, & Whitbourne, 2010; Schwartz et al., 2012). Figure 2.5 illustrates the general framework of identity process theory.

Identity Assimilation, Identity Accommodation, and Identity Balance. Just as in Piaget's theory, people use assimilation to interpret their experiences in terms of their existing schemas, the process of **identity assimilation** refers to the tendency to interpret new experiences in terms of a person's existing identity. You may see yourself as being a good student, for example. This view of yourself colors your academic experiences. If you are, in fact, a good student, you'll have plenty of instances that bolster this view. You receive good grades, your professors seem to like you, and other people come to you for help. Occasionally,

however, you may have experiences that contradict this self-image. You do poorly on an exam, an assignment is returned with many critical comments, or you're stumped in class when you're called upon to answer a question. How do you reconcile these experiences with your positive identity as a student? If you're using identity assimilation, you won't change your identity at all. Instead, you'll still see yourself as a good student, but one who ran into some rough material, an unfair test, or an inordinately harsh professor.

When people use identity assimilation, they tend to resist changing their identities in the face of criticism or disconfirming experiences. In fact, most people prefer to see themselves in the positive light of being physically and mentally competent, well liked, honest, and concerned about the welfare of others. The advantage of identity assimilation is that it allows people to feel reasonably happy and effective, despite being less than perfect. The downside of identity assimilation is that it can lead you to distort your interpretation of experiences when change would truly be warranted. Returning to our example of seeing yourself as a good student, by blaming the material or the professor for your bad grade, you may not realize how your own academic weaknesses contributed to the trouble you're in now.

We can see, then, that although identity assimilation has the advantage of allowing you to preserve a positive view of who you are, there may be negative consequences of refusing to incorporate these experiences into your identity. If you continue to blame the professor or the test for your poor grades, you will never find that you need to change. Eventually, these limitations need to be confronted. Whether this signifies that you are in the wrong major, are not studying hard enough, or may not be as smart as you once thought, learning to accept your imperfections is vital to your own growth.

Ideally, people eventually use **identity accommodation**, in which they make changes in their identities in response to experiences that challenge their current view of themselves. Identity change may be difficult, particularly at first, because you must come to grips with your weaknesses. However, the result will ultimately produce a self-image that is more in sync with reality.

It's possible, also, for an individual to use identity assimilation to bolster a negative rather than a positive view of the self. As we will learn later in the book, people who suffer from chronic depression often take an unduly pessimistic view of their identities, focusing on their weaknesses to the exclusion of seeing their strengths. In that case, identity accommodation can help them develop a more realistically positive set of schemas about their personal characteristics and strengths.

Both identity assimilation and identity accommodation are most beneficial when they operate in tandem. The process of **identity balance** refers to the dynamic equilibrium that occurs when people tend to view themselves consistently but can make changes when called for by their experiences. If you had that tendency to avoid letting your academic disappointments permeate your identity through identity assimilation, it would benefit you to use identity accommodation to acknowledge your areas of weakness, such as not being well-suited to your college major, perhaps. Although you wouldn't want to go overboard and conclude that you should give up school altogether, by using some identity accommodation, you could first admit to your problems and then set up a plan to improve your study habits.

As with identity assimilation, however, relying too heavily on identity accommodation can have destructive consequences. Individuals who define themselves entirely on the basis of their experiences, such as being viewed negatively by others, may be devastated by an event when they feel rejected. Imagine if every criticism ever leveled at you throughout your life caused you to question your personal qualities and think that you are a deeply flawed person. You would become extremely insecure, and your identity would fail to include the central compass that would ultimately allow you to have confidence in your abilities. In this case, you would benefit by ignoring those experiences that unrealistically caused you to question yourself.

Ideally, as in Piaget's theory, a balance between identity assimilation and identity accommodation can be achieved and maintained throughout your life. Piaget proposed that the natural tendency is to use assimilation when confronted with a new situation. People use what has worked in the

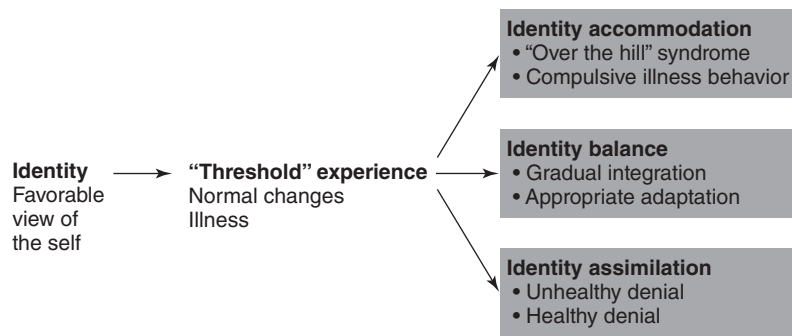For many people, age-related changes in appearance serve to stimulate changes in identity.

FIGURE 2.5

Identity Process Theory

People interpret "threshold" experiences in one of three ways: identity accommodation (changing your view of yourself), identity balance (maintaining a stable sense of yourself but making some changes), or identity assimilation (not changing your sense of self).

past to help understand what is happening in the present. However, when the situation warrants changes, you should be able to make those adjustments. Though it would hardly be ideal to change your self-view completely when someone criticizes you, if the criticism is consistent enough and comes from enough different quarters, you may be well advised to look honestly at yourself and see whether you should change something.

When identity balance is operating successfully, the individual feels that he or she has a strong sense of **self-efficacy**, a term used in the social psychological literature to refer to a person's feelings of competence at a particular task (Bandura, 1977). As we will see throughout the book, older adults high in particular types of self-efficacy recognize that they have experienced age-related changes but nevertheless feel in control of their ability to succeed.

The Multiple Threshold Model.   Throughout adulthood, identity processes are constantly brought to bear on the physical and cognitive changes that everyone experiences. These changes can be thought of as occurring through a sequence of phases over time (Whitbourne & Collins, 1998). The **multiple threshold model** of change in adulthood proposes that individuals realize that they are getting older through a stepwise process as aging-related changes occur. Each age-related change (such as wrinkling of the skin or a decreased reaction time) brings with it the potential for another threshold to be crossed. People are likely to monitor the areas of the greatest significance to their identities with great care or vigilance, while paying less attention to the thresholds that don't mean as much to them. You may be preoccupied with the fact that your hair is thinning or turning gray but less focused on the changes in your muscles. Someone else may feel oppositely, and disregard gray hair but fixate on the loss of muscle strength.

Whatever the area of greatest relevance, at the point of crossing a threshold, people are prompted to recognize the reality of the aging process in that particular area of functioning. It is during the process of moving from identity assimilation to identity accommodation through the occurrence of these thresholds that a new state of balance is reached. Ultimately, people will only be able to adapt to age-related changes once they have examined the meaning of the change and incorporated it into their existing view of the self.

Figure 2.5 represents identity changes in terms of threshold experiences. Almost all young adults see themselves as "youthful." In Western society, because of ageism, this youthful image is one that many people would like to preserve and therefore they resist making changes to this image. You perhaps feel this way now. It's true that you're no longer an adolescent, but you almost certainly still regard yourself as being young. You may feel this way for years, if not decades, identifying yourself with the younger generation.

It won't be too long, however, until you encounter experiences that lead you to your first "threshold." Perhaps you feel a little stiff when you get up from a chair or find out that your blood pressure is higher than it used to be. Many people say that the first time they felt old was when someone called them "sir" or "ma'am." At that point, you may start to challenge the view you had of yourself as a young person. Your options now are to disregard the whole experience and not change your identity to see yourself as not-so-young (identity assimilation). Or you might become completely thrown by the experience and conclude that you are heading more swiftly than you hoped to middle age (identity accommodation). It's also possible that you might note the experience, admit that you're not a teenager any more, and feel perfectly fine with the fact that people are treating you with a bit more dignity (identity balance).

Identity assimilation can be healthy or unhealthy. The unhealthy type of identity assimilation occurs when people ignore warning signs that the changes their body is going through require attention. If your blood pressure really

is too high, you should explore ways to lower it, no matter what your age. It would not be healthy to deny the condition. On the other hand, a healthy denial occurs when people avoid becoming overly preoccupied with age-related changes that are truly inconsequential to their overall health and well-being, especially if there is nothing they can do to ameliorate the process. Healthy deniers continue or begin engaging in preventive behaviors without overthinking their actions and reflecting at length about their own mortality. However, at some point, everyone needs to confront these changes, to some extent. You can't completely ignore the fact that you are getting older no matter what your age.

Let's look next at identity accommodation in which people change their identities in response to experiences. Theoretically, identity accommodation helps to keep identity assimilation in check. However, people who conclude that one small age change means they are "over-the-hill" may be just as likely to avoid taking preventative actions as those who engage in unhealthy denial. They incorrectly conclude that there's nothing they can do to slow down the aging process, so why try? Similarly, people who are told they must watch their blood pressure may go overboard and do nothing but worry about what this means for their health. They "become" their illness, which they allow to take over their identity.

Eventually, if the pendulum swings from identity accommodation back to identity assimilation, the individual can reestablish a middle ground between becoming overly preoccupied with change versus pretending that changes are not occurring. People who use identity balance accept that they are aging without adopting a defeatist attitude. They take steps to ensure that they will remain healthy but do not become demoralized about conditions or limitations they may already have developed. Additionally, they are not deluded into thinking that they will be young forever.

The advantages of identity balance (and to an extent healthy denial) are that the older adult adopts an active "use it or lose it" approach to the aging process. By remaining active, people can delay or prevent many if not most age-related negative changes. On the other hand, there are many "bad habits," or ways in which a person's behavior can accelerate the aging process. Some of the most common negative behaviors, described in Chapter 1, include overexposure to the sun and smoking. Ideally, people adapt to the aging process by taking advantage of the use-it-or-lose-it approach and avoiding the bad habits. Less of a strain will be placed on both identity assimilation and accommodation if people can take advantage of the many strategies receiving increasing publicity designed to promote good health for as long as possible.

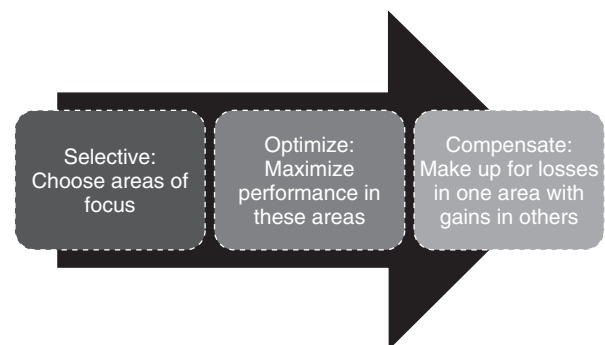## The Selective Compensation with Optimization Model

We see, then, that people adapt mentally to the age-related changes they experience by shifting their priorities. According to the **selective optimization with compensation model (SOC)**, adults attempt to preserve and maximize the abilities that are of central importance and put less effort into maintaining those that are not (Baltes & Baltes, 1990) (see Figure 2.6). Older people make conscious decisions regarding how to spend their time and effort in the face of losses in physical and cognitive resources.

The SOC model implies that at some point in adulthood, people deliberately begin to reduce efforts in one area in order to focus more on achieving success in another. It is likely that the areas people choose to focus on are those that are of greater importance and for which the chances of success are higher. Time and health limitations may also be a factor. If someone who has enjoyed high-impact aerobics finds the activity too exerting or hard on the knees, this person may compensate by spending more time doing yoga. Similar processes may operate in the area of intellectual functioning. The older individual may exert more effort toward solving word games and puzzles and spend less time on pastimes that involve spatial and speed skills, such as fast-moving computer games. If reading becomes too much of a chore due to fading eyesight, the individual may compensate by switching to audio books.

Concepts from the multiple threshold model would seem to fit well with the SOC model. People may make choices to optimize those areas of functioning that are central to their identities. Those who value the mind will compensate for whatever changes in their ability to solve mental puzzles by finding other intellectually demanding activities that they can still perform. People who enjoyed

FIGURE 2.6

Selective Optimization with Compensation

Selective: Choose areas of focus

Optimize: Maximize performance in these areas

Compensate: Make up for losses in one area with gains in others

crafts that required very fine motor movements that they can no longer perform may switch to projects that they complete on a somewhat larger scale and still feel satisfied. It may be difficult at first, but people who are able to make accommodations to age-related changes without becoming overwhelmed or preoccupied will be able to reestablish their sense of purpose and well-being.

Although the SOC model may seem to present a negative view of aging, in that it emphasizes the way that people adapt to loss, it can also be seen as offering a realistic perspective on the fact that there are losses in adulthood that can often outweigh the gains (Heckhausen, 1997). However, people adapt to these changes by readjusting their goals and, in the process, can maintain their sense of well-being (Frazier, Barreto, & Newman, 2012).

BIOLOGICAL APPROACHES TO AGING IN ADULTHOOD

Biological approaches to aging tackle the fundamental question of why the body changes over the course of life. As stated by Stanford University's Walter Bortz (2010, p. 383): "What are the generic properties of life, which establish its essence? What is aging? Whatever the answer, it must transcend biology as everything in the universe ages, galaxies, canyons, Chevrolets, redwoods, and turtles." For reasons we don't now understand, the body's biological clock continues to record the years with the passage of time. Ultimately, the aging of the body sets the limit on life's length, but most gerontologists agree that people can compensate through behavioral measures for many of the changes associated with the aging process to alter the timing of these events.

Acknowledging the role of biology begs the question: Why do living organisms grow old and die? If you are a fan of science fiction, you have surely read stories of a world in which aging does not occur or occurs so slowly that people live for hundreds of years. While these fictional accounts may be engrossing and even tempting to imagine, there are some obvious problems associated with such a world. Outcomes such as overpopulation, a lack of adequate resources, and intergenerational strife are just some of the possibilities. Presumably, to keep the population in check, birthrates would be reduced to a virtual standstill.

Some scientists believe that organisms are programmed to survive until they reach sexual maturity. Having guaranteed the survival of their species, living creatures are programmed to deteriorate or diminish once the genes programmed to keep them alive past that point are no longer of use to the species. Biologically speaking, according to this view, reproduction is the primary purpose of life,

and once this criterion has been met, there are no specific guidelines to determine what happens next. Although it's not possible to know "why" aging occurs, the fact is that it does. Researchers who study aging continue to explore whether aging is in fact the result of a correctable defect in living organisms. We may not be able to guarantee that the aging process can be ground to a halt, even with the most advanced scientific methods; however, researchers who study aging believe that their efforts will result in concrete improvements to people's lives.

Genes and DNA

To understand the biological approaches to aging, we need to explain several basic concepts about genetics. Our focus will be on those aspects of genetics most relevant to theories of aging to give students some of the background needed to understand this material.

To begin, inherited characteristics are found in the **genome**, the complete set of instructions for "building" all the cells that make up an organism (see Figure 2.7). The human genome is found in each nucleus of a person's many trillions of cells. The genome is contained in **deoxyribonucleic acid (DNA)**, a molecule capable of replicating itself that encodes information needed to

FIGURE 2.7

From Genome to Protein

Chromosome

Genome

DNA

Genes

Genes contain instructions for making proteins

Proteins

Proteins act alone or in complexes to perform many cellular functions