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Second Edition

Development Across the Life Span

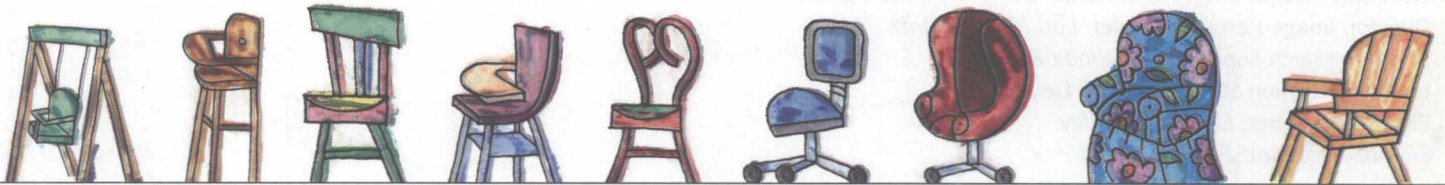
Robert S. Feldman



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Development Across the Life Span

SECOND EDITION



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University of Massachusetts at Amherst

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Preface

This book tells a story: the story of our lives, and our parents' lives, and the lives of our children. It is the story of human beings, and how they get to be the way they are.

Unlike any other area of study, lifespan development speaks to us in a very personal sense. It encompasses the range of human existence from its beginnings at conception to its inevitable ending at death. It is a discipline that deals with ideas and concepts and theories, but one that above all has at its heart people—our fathers and mothers, our friends and acquaintances, our very selves.

Development Across the Life Span, second edition, seeks to capture the discipline in a way that sparks and nurtures and shapes students' interest. It is meant to excite readers about the field and to draw them into its way of looking at the world.

Overview

The Goals of the Book

As it did in its first edition, *Development Across the Life Span*, second edition, seeks to accomplish the following four major goals:

- First and foremost, the book provides a broad, balanced overview of the field. It is designed to introduce readers to the theories, research, and applications that constitute the discipline, examining both the traditional areas of the field as well as more recent innovations.

The book pays particular attention to the applications of developmentalists. While not slighting theoretical material, the text emphasizes what developmentalists *know*, rather than focusing on unanswered questions. It demonstrates how this knowledge may be applied to real-world problems.

In sum, the book highlights the interrelationships among theory, research, and application, and it accentuates the scope and diversity of the field. It also illustrates how developmentalists use theory, research, and applications to help solve significant social problems.

- The second major goal of the text is to explicitly tie development to students' lives. The findings of developmentalists have a significant degree of relevance to students, and this text is meant to illustrate how these findings can be applied in a meaningful, practical sense. For instance, applications are presented in a contemporaneous framework. The book includes current news items, timely world events, and contemporary uses of development that are designed to draw readers into the field. Numerous descriptive scenarios and vignettes reflect everyday situations in people's lives, explaining how they relate to development.
- The third goal is to illustrate both the commonalities and diversity of today's multicultural society. Consequently, every chapter has a "Developmental Diversity" section. These features explicitly consider how cultural factors relevant to development both unite and diversify our contemporary, global society. In addition, the book incorporates material relevant to diversity throughout every chapter.
- Finally, the fourth goal of the text is one that underlies the other three: making the field of development engaging, accessible, and interesting to students. Lifespan development is a joy to teach, because so much of it has direct, immediate meaning to our lives. Because all of us are involved in our own developmental paths, we are tied in very personal ways to the content areas covered by the book. *Development Across the Life Span*, then, is meant to engage and nurture this interest, planting a seed that will develop and flourish throughout readers' lifetimes.

In short, the book seeks to provide a broad overview of the field of lifespan development, integrating the theory, research, and applications of the discipline. It is meant to be a book that readers will want to keep in their own personal libraries, one that they will take off the shelf when considering problems related to that most intriguing of questions: how do people get to be the way they are?

Specific Features

CHAPTER-OPENING PROLOGUES

Each chapter begins with a short vignette, describing an individual or situation that is relevant to the basic developmental issues being addressed in the chapter. For instance, the chapter on prenatal development describes the birth of septuplets; one of the chapters on adolescence provides an account of three students' lives; and a chapter on middle adulthood discusses a 47-year-old who returns to college.

HEREDITY

Fertilization: The Moment of Conception
 Genes and Chromosomes: The Code of Life
 Multiple Births: Two—or More—for the Genetic Price of One
 The Basics of Genetics: The Mixing and Matching of Heredity
 Inherited and Genetic Disorders: When Development Goes Awry
 Genetic Counseling: Predicting the Future from the Genes of the Present
 Directions in Development *Hello Dolly: Gene Therapy and Cloning*
 The Role of the Environment in Determining the Expression of Genes: From Genotypes to Phenotypes
 Alternative Routes to Pregnancy: Giving Nature a Boost
 Speaking of Development *Jeff Milunsky, Geneticist*
 Review and Rethink

THE INTERACTION OF HEREDITY AND ENVIRONMENT

Answering the Nature–Nurture Riddle
 Physical Traits: Family Resemblances

PROLOGUE: MULTIPLICITY



Kenny and Bobbi McCaughey, parents of septuplets born in Iowa.

On a warm and sunny day . . . , Kathy Adleman drove from her home in Mason City, Iowa, 130 miles south to the town of Carlisle to check on the pregnancy of her daughter-in-law

LOOKING AHEAD SECTIONS

These opening sections orient readers to the topics to be covered, bridging the opening prologue with the remainder of the chapter and providing orienting questions.

LOOKING AHEAD

It was true: After taking a fertility drug to stimulate pregnancy, Bobbi McCaughey and her husband, Kenny, got more than they bargained for. Kenneth, Brandon, Alexis, Nathan, Joel, Sue, and Kelsey—seven of them—arrived one November afternoon. It was more likely that Bobbi McCaughey would be struck dead by a falling asteroid than conceive and deliver that many children.

Although an extreme case, the conception of the McCaughey septuplets is part of an everyday miracle involved in the first stirrings of all new life. In this chapter, we'll examine what researchers in child development and other scientists have learned about ways that heredity and the environment work in tandem to create and shape human beings. We begin with the basics of heredity, examining how we receive our genetic endowment. We consider a burgeoning area of study, behavioral genetics, that specializes in the consequences of heredity on behavior. The chapter also discusses what happens when genetic factors cause development to go awry, and how such problems are dealt with through genetic counseling and the brave new world of cloning and genetic engineering.

Q

- What is our basic genetic endowment, and how can human development go awry?
- How do the environment and genetics work together to determine human characteristics?
- Which human characteristics are significantly influenced by heredity?
- What happens during the prenatal stages of development?
- What are the threats to the fetal environment and what can be done about them?

DIRECTIONS IN DEVELOPMENT

Each chapter includes a box that describes current developmental research or research issues, applied to everyday problems. For instance, these sections include discussions of gene therapy and cloning, child abuse, bullying, adolescents in cyberspace, the downside of self-esteem, and new approaches to increasing the life span.



Directions in Development

Hello Dolly: Gene Therapy and Cloning

In all ways she appeared to be an ordinary sheep, not much to look at, with little in the way of personality. But in one way she was far from ordinary, for Dolly, as she was called, was the first animal to be cloned from the cells of an adult. An exact genetic replica of another adult sheep, Dolly was soon followed by other cloned animals who were genetically identical to adults (Pennisi, 1997; Kolata, 1998).

The technological advance that Dolly represents does more than raise ethical questions about the possibility of making genetic replicas of adult humans. It also holds the possibility of correcting genetic flaws even before an individual is born—a procedure that likely will revolutionize medicine in the 21st century.

Already, some forms of gene therapy are being used to correct genetic defects in humans. In *gene therapy*, researchers inject genes that are targeted to correct a particular disease into a patient's blood stream. When the genes arrive at the site of the defective genes that are causing the disease, their presence leads to the production of chemicals that can treat the prob-



Dolly, the cloned sheep, had raised significant ethical questions.



Developmental Diversity

Cultural Differences in Physical Arousal: Might a Culture's Philosophical Outlook Be Determined by Genetics?

The Buddhist philosophy, an inherent part of many Asian cultures, emphasizes harmony and peacefulness, and suggests that one should seek the eradication of human desire. In contrast, some of the traditional philosophies of Western civilization, such as those of Martin Luther and John Calvin, accentuate the importance of controlling the anxiety, fear, and guilt that are thought to be basic parts of the human condition.

Could such philosophical approaches reflect, in part, genetic factors? That is the controversial suggestion made by developmental psychologist Jerome Kagan and his colleagues. They speculate that the underlying temperament of a given society, determined genetically, may predispose people in that society toward a particular philosophy (Kagan, Arcus, & Snidman, 1993).

Kagan bases his admittedly speculative suggestion on well-confirmed findings that show clear differences in temperament between Caucasian and Asian children. For instance, one study that compared 4-month-old infants in China, Ireland, and the United States found several relevant differences. In comparison to the Caucasian American babies and the Irish babies, the

DEVELOPMENTAL DIVERSITY

Every chapter has at least one "Developmental Diversity" section incorporated into the text. These sections highlight issues relevant to the multicultural society in which we live. Examples of these sections include discussions of developing racial and ethnic awareness in childhood, cultural differences in approaches to academic success, cultural differences in health beliefs, gay and lesbian relationships, and cultural constructions of age milestones.



The Informed Consumer of Development

Optimizing the Prenatal Environment

If you are contemplating ever having a child, by this point in the chapter you may be overwhelmed by the number of things that can go wrong. Don't be. Although both genetics and the environment pose their share of risks, in the vast majority of cases, pregnancy and birth proceed without mishap. Moreover, there are several things that women can do to optimize the probability that pregnancy will progress smoothly—both before and during pregnancy. Among them:

- For women who are planning to become pregnant, several precautions are in order. First, women should have non-emergency X-rays only during the first 2 weeks after their

eating for two. This means that it is more essential than ever to eat regular, well-balanced meals.

- Do not use alcohol and other drugs. The evidence is clear that many drugs pass directly to the fetus and may cause birth defects. It is also clear that the more one drinks, the greater the risk to the fetus. The best advice: Do not use *any* drug unless directed by a physician.
- Monitor caffeine intake. Although it is still unclear whether caffeine produces birth defects, it is known that the caffeine found in coffee, tea, and chocolate can pass to the fetus, acting as a stimulant. Because of this, you probably should not drink more than a few cups of coffee a day.
- Whether pregnant or not, do not smoke. This holds true for mothers, fathers, and anyone else in the vicinity of the pregnant mother, because research suggests that smoke in the fetal environment can affect birth weight.

THE INFORMED CONSUMER OF DEVELOPMENT

Every chapter includes information on specific uses that can be derived from research conducted by developmental investigators. For instance, the text provides concrete information on optimizing the prenatal environment, keeping preschoolers healthy, assessing language development, choosing a day-care provider, using discipline effectively, choosing a career, and caring for people with Alzheimer's disease.



SPEAKING OF DEVELOPMENT

Jeff Milunsky, Geneticist

Education: Boston University, B.A. in biology; Boston University School of Medicine, M.D.

Position: Director of Clinical Genetics, Center for Human Genetics, Boston University School of Medicine; Assistant Professor of Pediatrics, Boston University School of Medicine

Home: West Roxbury, Massachusetts



SPEAKING OF DEVELOPMENT

Each chapter includes an interview with a person working in a field that uses the findings of lifespan development. Among those interviewed are a toy designer, the chief of the marriage and family statistics branch of the U.S. Census Bureau, a former U.S. Secretary of Education, a child-care provider, and a director of senior citizens programs.

The last 10 years of the 20th century has brought important advances in all areas of medicine, particularly in the field of genetics. Progress in our knowledge of genetics has made the specialty of prenatal genetics possible.

National Institutes of Health issued a consensus statement in 1997 recommending that, in *“Genetic counseling is best provided to couples during the preconception period. . . .”*

COMPANION WEBSITE (CW) LINKS

A new and significant feature in this edition, Companion Website Links are marginal icons indicating material related to a page on the World Wide Web. Readers can refer to the page number on the *Development Across the Life Span* Web page, where hotlinks are provided to the relevant Websites. *The Development Across the Life Span* Website can be found at <http://www.prenhall.com/feldman>.

bred to have significantly *different* genetic backgrounds on particular traits. Then, by exposing such animals to identical environments, they can determine the role that genetic background plays.

Of course, the drawback to using nonhumans as research subjects is that we cannot be sure how well the findings we obtain can be generalized to people. Still, the opportunities that animal research offers are substantial.

Human Studies: Exploiting Genetic Similarities and Dissimilarities. Obviously, researchers can't control either the genetic backgrounds or the environments of humans in the way they can with nonhumans. However, nature conveniently has provided the potential to carry out various kinds of "natural" studies—in the form of twins.

Recall that identical, monozygotic twins share an identical genetic code. Because their inherited backgrounds are precisely the same, any variations in their behavior must be due



REVIEW AND RETHINK SECTIONS

Interspersed throughout each chapter are three short recaps of the chapters' main points, followed by questions designed to provoke critical thinking.



REVIEW AND RETHINK

REVIEW

- In humans, the male sex cell (the sperm) and the female sex cell (the ovum) provide the developing baby with 23 chromosomes each, through which the baby inherits characteristics from both mother and father.
- A genotype is the underlying combination of genetic material present in an organism, but invisible; a phenotype is the visible trait, the expression of the genotype. Within a range predetermined by the genotype, environmental factors play a significant role in determining the way in which that genotype will be expressed as a phenotype.

RETHINK

- How might adopted children develop traits similar to those of their adoptive parents? What sorts of traits do you think might be shared or different in adoptive families?

RUNNING GLOSSARY

Key terms are defined in the margins of the page on which the term is presented.

genetic counseling the discipline that focuses on helping people deal with issues relating to inherited disorders

amniocentesis the process of identifying genetic defects by examining a small sample of fetal cells drawn by a needle inserted into the amniotic fluid surrounding the unborn fetus

END-OF-CHAPTER MATERIAL

Each chapter ends with Looking Back and a list of key terms and concepts. This material is designed to help students study and retain the information in the chapter. Every chapter also ends with a short epilogue that includes critical-thinking questions relating to the prologue at the opening of the chapter. Because the opening prologues serve as case studies that foreshadow the topics that the chapter will address, these end-of-chapter thought-provoking questions provide a way of tying the chapter together. They also illustrate how the concepts addressed in the chapter can be applied to the real-world situation described in the opening prologue.



■ **What is our basic genetic endowment, and how can human development go awry?**

- In human fertilization, ovum and sperm unite to form a single new cell called a zygote, which receives 23 chromosomes from each parent. Within its 46 chromosomes is the genetic blueprint that will guide cell activity for the rest of the individual's life.
- Gregor Mendel discovered an important genetic mechanism that governs the interactions of dominant and recessive genes and their expression in alleles. Traits such as hair and eye color and the presence of phenylketonuria (PKU) are alleles and follow this pattern.

EPILOGUE: MULTIPLICITY

We've discussed the basics of heredity and genetics in this chapter, including the way in which the code of life is transmitted across generations through DNA. We have also seen how genetic transmission can go wrong, and we have discussed ways in which genetic disorders can

KEY TERMS AND CONCEPTS

gametes (p. 46)
fertilization (p. 46)
zygote (p. 46)

amniocentesis (p. 56)
chorionic villus sampling (CVS) (p. 56)
ultrasound sonography (p. 56)

What's New in This Edition?

A considerable number of new topics and areas have been added to the second edition. For example, the coverage of behavioral genetics, cloning, evolutionary approaches, and Vygotsky receive significant new coverage. In addition, a wealth of contemporary research is cited in this edition. Hundreds of new research citations have been added, most from the last few years.

A sampling of topics that have been either newly included or expanded also illustrates the scope of the revision; they include new material on ethnography, gene therapy, new breast-feeding guidelines, automaticity in information processing, the NICHD study on infant care, memory and eyewitness testimony of children, use of Prozac and childhood depression, emotional intelligence, adolescent Internet surfing, the downside of self-esteem, racial and ethnic identity formation, effects of welfare reform, estrogen supplement dilemma, the cultural construction of midlife, increasing the life span, changes in the view of neuronal loss in late adulthood, assisted care living arrangements, theory of mind in late adulthood.

Furthermore, several entirely new features have been added to the second edition. As mentioned earlier, each chapter contains *Companion Website* Links that lead readers to the *Development Across the Life Span* website, where they will be directed to specific websites relevant to the topic being discussed. In addition, every chapter now ends with an Epilogue that includes critical-thinking questions regarding the chapter prologue, tying the material in the chapter together.

Teaching Supports That Accompany the Book

Development Across the Life Span, second edition, is accompanied by a superb set of teaching and learning materials. They include the following:

Instructor's Resource Manual: Prepared by Susan Horton and Gayla Preisser of Mesa Community College, this IRM contains a wealth of teaching tips and creative ideas for new and experienced instructors alike. Each chapter includes: Learning Objectives, Key Terms/Concepts, Chapter Outline, Lecture Suggestions, Cooperative Learning Activities, Critical Thinking Questions/Exercises, Assignment Ideas, Reflective Journal Exercises, Suggested Films and Videos, and Classroom Handouts.

Prentice Hall Color Overhead Transparencies for Human Development: Available in acetate form, or as downloads from our Companion Website, these transparencies will add visual appeal to your discussion of key concepts in Developmental Psychology.

Test Item File: Prepared by Blaine Peden of University of Wisconsin, Eau Claire, this test item file contains over 2000 multiple choice, true/false, and short answer essay questions of varying levels of difficulty as well as factual, conceptual, and applied questions.

Prentice Hall Custom Tests: Available in two platforms, Windows and Macintosh, to allow instructors complete flexibility in building and editing their own customized tests. Advances in the most recent version of the software now allow online testing on a network and the **www**.

Toll-Free Telephone Test Preparation: Prentice Hall offers a telephone test preparation service through which instructors can call a toll-free number and select up to 200 questions from the printed *Test Item File* available with the text. The test, an alternate version, and the answer key are mailed or faxed within hours of the initial request.

Development Across the Life Span Companion Website Faculty Module: Providing online access to key instructor resources, this module of the Companion Website includes Lecture Outlines, Classroom Activity Suggestions, Powerpoint Presentation Slides and downloads of graphics from the text. Visit this site online at www.prenhall.com/feldman.

WebCT: For instructors interested in distance learning, Prentice Hall and WebCT Educational Technologies offer a fully customizable, online course with www Links, online testing, and many other course management features using the popular WebCT online course architecture. See your local Prentice Hall representative or visit our special Demonstration Central website at www.prenhall.com/demo.

Video Support Materials

Speaking of Development Videos: Providing students with information about job opportunities in many fields, this exclusive video tape program features interviews with eleven of the professionals highlighted within this text. Each segment visits the individual's workplace, discusses their background in developmental psychology and how it relates to their current job.

ABCNEWS

ABC News/Prentice Hall Video Libraries: Consisting of brief segments from award-winning programs such as "Nightline," "20/20," "PrimeTime Live," and "The Health Show," these videos discuss current issues and are a great way to launch your lectures. The following three video libraries are available to adopters of *Development Across the Life Span*:

Human Development 1998

Lifespan Development 1996

Child Development 1995

Student Supplements

Study Guide: Written by Carolyn Meyer, this study guide is designed to help students get the most out of the textbook. Each chapter includes a Study Outline, Learning Objectives, Critical Thinking and Application Questions, a Guided Review, Practice Tests, Key Names, and Key Terms with Definitions.

Development Across the Life Span Companion Website: Written by Lynn Vestal, this online study guide provides unique tools and support that integrate the world wide web into your course. Tied specifically to this text, each chapter includes Multiple Choice, True/False, Fill-In and Short Essay quizzes. Other activities include NetSearch, Web Destination, Chat Room and Bulletin Board. Visit this site online at www.prenhall.com/feldman.

Feldman Interactive Student CD-ROM: Available in the Fall, 1999, to purchasers of *Development Across the Life Span*, second edition, *Feldman Interactive* is a multimedia version of the text. Integrated into each chapter of an electronic version of this text are Author Tip Videos, Speaking of Development Videos and Activities, Theorist Biographies, Multiple Choice, True/False, Critical Thinking and Essay Quizzes, enhanced graphics, and direct access to hundreds of websites via our *Development Across the Life Span Companion Website*.



New York Times Themes of the Time Supplement for Developmental Psychology. In an exclusive arrangement, Prentice Hall and *The New York Times* have joined forces to bring students a complimentary newspaper supplement containing recent articles discussing issues and research.

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My education continued when I became a professor. I am especially grateful to my colleagues at the University of Massachusetts, who make the university such a wonderful place in which to teach and do research.

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Robert S. Feldman
University of Massachusetts at Amherst

About the Author



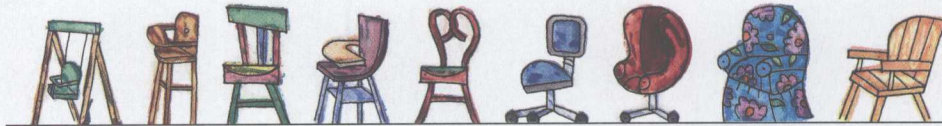
Robert S. Feldman is professor of psychology at the University of Massachusetts in Amherst, where he is Director of Undergraduate Studies and recipient of the College Distinguished Teacher Award. He was educated as an undergraduate at Wesleyan University, from which he graduated with High Honors, and received a M.S. and Ph.D. from the University of Wisconsin in Madison, where he specialized in social and developmental psychology.

Among his more than 100 books, chapters, and articles, he has edited *Development of Nonverbal Behavior in Children* (Springer-Verlag), *Applications of Nonverbal Behavioral Theory and Research* (Erlbaum), and co-edited *Fundamentals of Nonverbal Behavior* (Cambridge University Press). He is the recipient of grants from the National Institute of Mental Health and the National Institute of the Disabilities and Rehabilitation Research, which have supported his research on the development of nonverbal behavior in children. A past Fulbright lecturer and research scholar, he is a Fellow of the American Psychological Association and American Psychological Society.

During the course of nearly two decades as a college instructor, he has taught both undergraduate and graduate courses at Mount Holyoke College, Wesleyan University, Virginia Commonwealth University, in addition to the University of Massachusetts.

Professor Feldman is an avid, if unaccomplished, pianist, and an excellent cook. He has three children, and he and his wife, a psychologist, live in Amherst, Massachusetts, in a home overlooking the Holyoke mountain range.

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