

LIFE-SPAN

DEVELOPMENT

Thirteenth Edition

JOHN W. SANTROCK

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LIFE-SPAN

Development

Thirteenth Edition

JOHN W. SANTROCK

University of Texas at Dallas





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**With special appreciation to
my mother, Ruth Santrock, and
the memory of my father, John Santrock**

about the author

John W. Santrock

John Santrock received his Ph.D. from the University of Minnesota in 1973. He taught at the University of Charleston and the University of Georgia before joining the Program in Psychology and Human Development at the University of Texas at Dallas, where he currently teaches a number of undergraduate courses and was given the University's Effective Teaching Award in 2006.



John Santrock, teaching in his undergraduate course in life-span development.

John has been a member of the editorial boards of *Child Development* and *Developmental Psychology*. His research on father custody is widely cited and used in expert witness testimony to promote flexibility and alternative considerations in custody disputes. John also has authored these exceptional McGraw-Hill texts: *Psychology* (7th edition), *Children* (10th edition), *Adolescence* (12th edition), *Topical Life-Span Development* (4th edition), and *Educational Psychology* (4th edition).

For many years, John was involved in tennis as a player, teaching professional, and coach of professional tennis players. He has been married for more than 35 years to his wife, Mary Jo, who is a realtor. He has two daughters—Tracy, who is also a realtor, and Jennifer, who is a medical sales specialist at Medtronic. He has one granddaughter, Jordan, age 19, and two grandsons, Alex, age 6, and Luke, age 4. Tracy recently completed the New York Marathon, and Jennifer was in the top 100 ranked players on the Women's Professional Tennis Tour. In the last decade, John also has spent time painting expressionist art.

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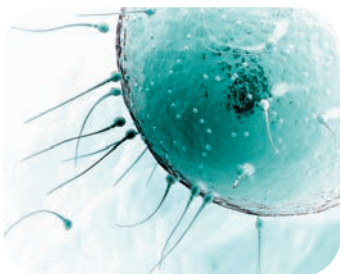
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expert consultants

Lifespan Development has become an enormous, complex field and no single author, or even several authors, can possibly keep up with all of the rapidly changing content in its many different areas. To solve this problem, author John Santrock sought the input of leading experts about content in a number of areas of human development. The experts provided detailed evaluations and recommendations in their area(s) of expertise. The biographies and photographs of the experts, who literally represent a who's who in the field of development, follow.



K. Warner Schaie is widely recognized as one of the pioneers who created the field of lifespan development and continues to be one of its leading experts. He is currently the Evan Pugh Professor Emeritus of Human Development and Psychology at the Pennsylvania State University. Dr. Schaie also holds an appointment as Affiliate Professor of Psychiatry and Behavioral Sciences at the University of Washington. He received his Ph.D. in psychology from the University of Washington, an honorary Dr. phil. from the Friedrich-Schiller University of Jena, Germany, and an honorary Sc.D. degree from West Virginia University. He received the Kleemeier Award for Distinguished Research Contributions and the Distinguished Career Contribution to Gerontology Award from the Gerontological Society of America, the MENSA lifetime career award, and the Distinguished Scientific Contributions award from the American Psychological Association. He is author or editor of 62 books including the textbook *Adult Development and Aging* (5th edition, with S. L. Willis) and the *Handbook of the Psychology of Aging* (6th edition, with J. E. Birren). He has directed the Seattle Longitudinal Study of cognitive aging since 1956 and is the author of more than 300 journal articles and chapters on the psychology of aging. His current research interests focus on the life course of adult intelligence, its antecedents and modifiability, the impact of cognitive activity in midlife on the integrity of brain structures in old age, the early detection of risk for dementia, and methodological issues in the developmental sciences.

"In my opinion, John Santrock's book continues to be by far the best lifespan developmental psychology text available that is suitable for a broad undergraduate audience as well as a comprehensive treatment for professionals in other fields who need a scholarly but very readable overview of major issues and current research on human development from birth to old age and death. The 13th edition is as usual an excellent update of the current research literature." —**K. Warner Schaie**, Pennsylvania State University



Diane Hughes is a leading expert on diversity and children's development. Following her doctoral work at the University of Michigan, she became a professor in the Department of Psychology at New York University and currently is a faculty member in the Steinhardt Department of Applied Psychology at New York University. Dr. Hughes is a community and developmental psychologist who examines ethnicity and race as contexts for parenting and adolescent development. She seeks to discover how parents from a range of ethnic backgrounds communicate information about ethnicity

and race in the course of their everyday routines and practices. Dr. Hughes and her colleagues have been awarded multi-million-dollar grants from the National Science Foundation to establish and maintain the Center for Research on Culture, Development, and Education at New York University.

"Thank you for the opportunity to review the chapters. What an impressive contribution. Reading John Santrock's chapters is always informative and thought provoking for me." —**Diane Hughes** New York University



Ross Thompson is one of the world's leading experts on children's socioemotional development. He currently is Professor of Psychology at the University of California–Davis. His research interests are in two fields. First, as a developmental psychologist, he studies early parent-child relationships, the development of emotional understanding and emotion regulation, conscience development, and the growth of self-understanding. Second, as a psycholegal scholar, he works on the applications of developmental research to public policy concerns, including the effects of divorce and custody arrangements on children, child maltreatment prevention, school readiness, research ethics, and early brain development and early intervention. Dr. Thompson is a founding member of the National Scientific Council on the Developing Child and was a member of the Committee on Integrating the Science of Early Childhood Development of the National Academy of Sciences that produced the book, *From Neurons to Neighborhoods: The Science of Early Childhood Development*. He is a member of the Board of Directors of Zero to Three: National Center for Infants, Toddlers, and Families, and is on the Editorial Advisory Board of *Wondertime* magazine. Dr. Thompson has twice been Associate Editor of *Child Development*, and is Consulting Editor for a series of topical texts in developmental psychology published by McGraw-Hill. His books include *Preventing Child Maltreatment Through Social Support: A Critical Analysis*; *The Postdivorce Family: Children, Families, and Society* (coedited with Paul Amato); and *Toward a Child-Centered, Neighborhood-Based Child Protection System* (coedited with Gary Melton and Mark Small). He is currently working on two books: *Early Brain Development, the Media, and Public Policy* and *Emotional Development*. Dr. Thompson has been a Visiting Scientist at the Max Planck Institute for Human Development and Education in Berlin, a Senior NIMH Fellow in Law and Psychology at Stanford University, and a Harris Visiting Professor at the University of Chicago. He received the Boyd McCandless Young Scientist Award for Early Distinguished Achievement from the American Psychological Association, the Scholarship in Teaching Award, and the Outstanding Research and Creative Activity Award from the University of Nebraska,

where he was also a lifetime member of the Academy of Distinguished Teachers.

"Once again, reading these draft chapters was a pleasure. The writing is clear, cogent, and easy to follow, and the major research topics are presented in a current and engaging manner. I like very much the "connections" that John Santrock is striving to create for this edition: Connections between topics in a chapter and issues discussed earlier or later in the text; connections between developmental research and personal growth; connections between research and development; and connections between science and research careers. I think students will respond well to these." —**Ross Thompson** University of California at Davis



William Hoyer is one of the world's leading experts on cognitive aging. He currently is professor of psychology and senior scientist at the Center for Health and Behavior at Syracuse University, where he teaches courses in adult development and aging. At Syracuse, he also is an associate of the Gerontology Center, director of the Graduate

Training Program in Experimental Psychology, and research professor of ophthalmology at Upstate Medical University. Dr. Hoyer obtained an undergraduate degree in psychology from Rutgers College, and M.S. and Ph.D. in experimental psychology from West Virginia University. His research interests center on skill learning, memory, and cognitive expertise from a developmental perspective. Dr. Hoyer is currently the principal investigator on a five-year research grant titled "Aging of Cognitive Mechanisms" from the National Institute on Aging. His publications include seven books and over 100 articles in such journals as *Developmental Psychology*, *Psychology and Aging*, and *Journal of Gerontology: Psychological Sciences*. Dr. Hoyer is a Fellow of the American Psychological Association, the American Psychological Society, and the Gerontological Society of America. He serves or has served on a number of grant review panels and on the editorial boards for journals, including *Developmental Psychology*; *Journals of Gerontology: Psychological Sciences*; *Aging, Neuropsychology, and Cognition*; and *Psychology and Aging*.

"Obviously it is a difficult task for a seasoned author and teacher to scrap or de-emphasize findings and perspectives that have evolved over the past two decades and in their place embrace and characterize the latest trends and new findings in the field. It is my opinion that John Santrock has an amazing knack for identifying the significant topics and issues in the field as they emerge and for presenting these topics and issues in ways that will be of interest and relevance to today's students . . . Unlike several of the competitors, John Santrock successfully sidesteps the fads and superficial topics—instead, he opts for presenting scientifically-sound material that is fresh, innovative, and impactful in an applied sense . . . John Santrock's approach to the material, that is, his emphasis on Connections, exploits new and emerging cross-linkages in the field" . . . In sum, most striking is John Santrock's skill to characterize the latest, best findings and ideas in this diverse field that spans from infancy to old age, from cells to culture, and from very technical to practical, and to effectively adapt this material to students. —**William Hoyer** Syracuse University



Elena Grigorenko is a leading expert on intelligence and heredity-environment issues. She currently is Associate Professor of Child Studies and Psychology at Yale, as well as Adjunct Professor of Psychology at Columbia University (USA) and Moscow State University (Russia). Dr. Grigorenko has published more than 250 peer-

reviewed articles, book chapters, and books. She has received awards for her work from five different divisions of the American Psychological Association. She recently won the APA Distinguished Award for an Early Career Contribution to Developmental Psychology. Dr. Grigorenko's research has been funded by NIH, NSF, DOE, Cure Autism Now, the Foundation for Child Development, the American Psychological Foundation, and other federal and private sponsoring organizations.

"The 13th Edition of Life-Span Development is a nice update." —**Ellen Grigorenko** Yale University



Joseph Campos is one of the world's leading experts on infants' and children's emotional development. He currently is a professor in the Department of Psychology at the University of California, Berkeley. Dr. Campos is President of the International Study of Infant Studies, and previously was the first Executive Officer of the

International Society for Research on Emotions. He has co-authored (with Michael Lamb) *Development in Infancy* and has co-edited one of the volumes of the *Handbook of Child Psychology* in multiple additions, as well as contributing major reviews of infant emotional development for this handbook. Dr. Campos also published *Emotions inside out: 130 years after Darwin's Expression of the Emotions in Man and Animals*. He holds Distinguished Teaching Awards from the University of Denver and the University of Illinois at Urbana-Champaign, and also is Distinguished Guest Professor at Beijing Normal University.

"I have always enjoyed John Santrock's writing and reviews, and this book is no exception. . . The treatment of temperament is very good."

—**Joseph Campos** University of California at Berkeley



Linda Mayes is a leading expert on prenatal development, infancy, and early childhood. She currently is the Arnold Gesell Associate Professor of Child Psychiatry, Pediatrics, and Psychology in the Yale Child Study Center. Dr. Mayes is also Special Advisor to the Dean in the Yale School of Medicine and chairman of the directorial team of

the Anna Freud Centre, London. Her research integrates perspectives from child development, behavioral neuroscience, psychophysiology and neurobiology, developmental psychopathology, and neurobehavioral teratology. She has published widely in the developmental psychology, pediatrics, and child psychiatry literature. Her work focuses on stress-response and regulatory mechanisms in young children at both biological and psychosocial risk. She has made contributions to understanding the mechanisms involved in prenatal stimulant exposure and the development of arousal regulation. Dr. Mayes' research also has contributed to a better understanding of links between dysfunctional emotional regulation and impaired prefrontal cortical function in young children. Her laboratory currently follows two longitudinal cohort. One study focuses on prenatal exposure to drugs and adolescent development; another examines the influence of growing up in economically deprivation conditions on emerging executive control functions in preschool and early school-aged children. Also, with other colleagues in the Center, she studies how adults transition to parenthood and the basic neural circuitry of early

parent-infant attachment using both neuroimaging and electroencephalographic techniques.

"The chapter (3, Prenatal Development and Birth) is comprehensive and clearly written. It provides students with a good introduction to this period of development." —**Linda Mayes** Yale University



Arthur Kramer is Swanlund Chair and Professor of Psychology. He received his Ph.D. in Cognitive/Experimental Psychology from the University of Illinois in 1984. He holds appointments in the Department of Psychology, Neuroscience program, and the Beckman Institute. Professor Kramer's research projects include topics in Cognitive Psychology, Cognitive Neuroscience and Human Factors. A major focus of his labs recent research is the understanding and enhancement of cognitive and neural plasticity across the lifespan. He is the Director of the Biomedical Imaging Center and Co-Director of the NIH Center for Healthy Minds. Professor Kramer served as an Associate Editor of *Perception and Psychophysics* and is currently a member of seven editorial boards. He is a fellow of the American Psychological Association, American Psychological Society, a member of the executive committee of the International Society of Attention and Performance, and a recent recipient of a NIH Ten Year MERIT Award. Professor Kramer's research has been featured in a long list of print, radio and electronic media including the *New York Times*, *Wall Street Journal*, *Washington Post*, *Chicago Tribune*, *CBS Evening News*, *Today Show*, *NPR* and *Saturday Night Live*.

"... I very much enjoyed reading Chapters 17 (Physical Development and Aging) and 18 (Cognitive Development and Aging) of the 13th edition of Life-Span Development. The material is up-to-date and the different connections that are integrated within the chapters render the material quite accessible to today's students." —**Arthur Kramer** University of Illinois at Urbana-Champaign



Karen Fingerman is a leading expert on aging, families, and socioemotional development. She currently is the Berner Hanley Professor in Gerontology at Purdue University. Dr. Fingerman has published numerous scholarly articles on the positive and negative aspects of relationships involving mothers and daughters, grandparents and

grandchildren, friends, acquaintances, and peripheral social ties. The National Institute on Aging has funded earlier work on problematic social ties across the lifespan and currently is funding her research on parents and grown children. The Brookdale Foundation and the MacArthur Transitions to Adulthood group also have funded her research. Dr. Fingerman has received the Springer Award for Early Career Achievement in Research on Adult Development and Aging from Division 20 of the American Psychological Association in and the Margret Baltes Award for Early Career Achievement in Behavioral and Social Gerontology from the Gerontological Society of America.

"I think the Developmental Connections idea will be a big plus for this book. Students will find that very helpful and instructors will as well. I was very impressed with how up-to-date the research is across the board. I appreciated the updated information regarding brain development and neuroscience." —**Karen Fingerman** Purdue University



Deborah Carr is a leading expert on dying, widowhood, end-of-life decision-making, and families in older adults. She is currently an associate professor in the department of sociology and Institute for Health, Health Care Policy and Aging Research at Rutgers University. Dr. Carr obtained her Ph.D. in sociology at University of Wisconsin.

She is author or editor of several books, including *Encyclopedia of the Life Course and Human Development*, and *Spousal Bereavement in Later Life* (with Randolph Nesse and Camille Wortman), and has authored more than 50 journal articles and book chapters. Dr. Carr is a fellow of the Gerontological Society of America and a member of the honorary Sociological Research Association. She has also served as deputy editor of *Journal of Marriage and Family*, and an editorial board of many journals including *Journal of Health and Social Behavior*, and *Journal of Gerontology: Social Sciences*.

"I very much enjoyed reading the text and appreciate the thought and care John Santrock devoted to meeting the needs of students, and addressing the concerns of past reviewers. The text is interesting, engaging, and does a superb job of covering a vast amount of material in a clear and straightforward way." —**Deborah Carr** Rutgers University

Making Connections . . . From My Classroom to *Life-Span Development* to You

Having taught lifespan development every semester for 25 years now, I'm always looking for ways to improve my course and *Life-Span Development*. Just as McGraw-Hill looks to those who teach the lifespan development course for input, each year I ask the almost 200 students in my lifespan development course to tell me what they like about the course and the text, and what they think could be improved. What have my students told me lately about my course and text? Students said that highlighting connections among the different aspects of lifespan development would help them to better understand the concepts. As I thought about this, it became clear that a *connections* theme would provide a systematic, integrative approach to the course material. I used this theme to shape my current goals for my lifespan development course, which, in turn, I've incorporated into *Life-Span Development*:

1. **Connecting with today's students** To help students *learn* about lifespan development more effectively
2. **Connecting research to what we know about development** To provide students with the best and most recent *theory and research* in the world today about each of the periods of the human life span
3. **Connecting developmental processes** To guide students in making *developmental connections* across different points in the human life span
4. **Connecting development to the real world** To help students understand ways to *apply* content about the human life span to the real world and improve people's lives; and to motivate you to think deeply about *your own personal journey through life* and better understand who you were, are, and will be

Connecting with Today's Students

In *Life-Span Development*, I recognize that today's students are as different in some ways from the learners of the last generation as today's discipline of lifespan development is different from the field thirty years ago. Students now learn in multiple modalities; rather than sitting down and reading traditional printed chapters in linear fashion from beginning to end, their work preferences tend to be more visual and more interactive, and their reading and study often occur in short bursts. For many students, a traditionally formatted printed textbook is no longer enough when they have instant, 24/7 access to news and information from around the globe. Two features that specifically support today's students are the adaptive diagnostic tool and the learning goals system.

Adaptive Diagnostic Tool

Connect Psychology is our response to today's student. The groundbreaking adaptive diagnostic tool helps students "know what they know" while helping them learn what they don't know through engaging interactive exercises, click/drag activities, the Milestones program, and video clips. Instructors using Connect are reporting that their students' performance is improving by a letter grade or more. Through this unique tool, *Life-Span Development* gives instructors the ability to identify struggling students quickly and easily, *before* the first exam.

Connect Psychology's adaptive diagnostic tool develops an individualized learning plan for every student. Confidence levels tailor the

