HUMAN MOTOR DEVELOPMENT

A LIFESPAN APPROACH

THIRD EDITION

V. GREGORY PAYNE • LARRY D. ISAACS

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To Luke, the best motor development professor ever, and our hopes for a bright future. ITAYATT

V.G.P

To my children, Brooke and Timothy.
No words could ever adequately express my love for each of you.

L.D.I.

ABOUT THE AUTHORS

V. Gregory Payne is beginning his twelfth year at San Jose Sate University where he is professor in the Department of Human Performance. He received his undergraduate degree from Western Illinois University, a master's degree from the University of Iowa, and a doctoral degree specializing in motor development from Indiana University. Dr. Payne is the 1994-95 president of the California Association for Health, Physical Education, Recreation, and Dance and is currently serving as the Past Chair of AAHPERD's Motor Development Academy. He is a special advisor to California's Governor's Council on Physical Fitness and Sports, has been a fellow in the Research Consortium of AAHPERD since 1983, and has served as co-chair of the Research Committee of the Council on Aging and Adult Development. He recently received the *Research Quarterly for Exercise and Sport* writing award for meta-analysis conducted on children's exercise. He resides in San Jose's Almaden Valley with his wife, Barb, and their 5-year-old son, Luke.

Larry D. Isaacs is professor in the Exercise Science Program, Department of Biology, College of Science and Mathematics at Wright State University. Since receiving his doctorate in 1979 from the University of Maryland, Dr. Isaacs has served as a reviewer for many scholarly journals. In addition, he has published numerous scholarly articles and has written six textbooks. Over the past 16 years, his writings have been recognized by many organizations including the American Alliance for Health, Physical Education, Recreation, and Dance where he has received the status of Research Fellow. In 1993 Dr. Isaacs received national certification (Health-Fitness Track) with the American College of Sports Medicine. Presently Dr. Isaacs' research is focusing on the physiological basis of muscular strength development in both prepubescent and elderly individuals. He currently lives in Dayton with his wife, Joy, and two children, Brooke and Timothy, 14 and 10 years old, respectively.

Preface

As in the first two editions of *Human Motor Development: A Lifespan Approach,* this new edition covers well-established undergraduate motor development material. Our approach to this subject is unique in many ways.

SPECIAL FEATURES AND ORGANIZATION

Unlike traditional motor development texts that present development as a concept that ceases at adulthood, our book approaches motor development as a lifelong process. This approach recognizes the dramatic changes occurring within our population and the increasing popularity of movement programs outside the school setting.

Another feature of our book is the underlying philosophy that movement influences *and is influenced by* social, cognitive, and physical aspects of human development. That philosophy is apparent throughout the book, and separate chapters are allocated to each of these areas of human development.

Chapter 15, Youth Sports, and Chapter 18, Planning and Conducting Developmental Movement Programs, present information often omitted in traditional motor development texts. In addition, Chapter 18 provides information for those who are interested in setting up their own developmental movement program.

A number of features assist both the student and instructor. For example, each chapter concludes with a summary and a list of key terms, and complete references, by chapter, are provided at the end of the book. In addition, we have created a new Instructor's Manual. The Manual includes a sample syllabus, multiple choice and essay questions for each chapter (more than 500 test items total), suggested assignments for each chapter, expanded assignments (such as case studies and program critiques), and more than 70 transparency masters highlighting key information.

The organization of our book remains straightforward. Part One provides an overview of human development and includes chapters on the developmental aspects mentioned above. Part Two covers factors affecting development, including the effects of early stimulation and deprivation. Part Three, Physical Changes Across the Lifespan, and Part Four, Movement Across the Lifespan, present the book's core concepts. We conclude with Part Five, Assessing and Implementing a Program, an expanded, two-chapter part.

NEW FEATURES

All of the chapters have been updated and modified to reflect current research in motor development and to improve readability for students. The following are some major modifications you will find in the new third edition:

- Chapter 1, Introduction to Motor Development, has several new tables. We have also expanded the section on research designs and incorporated a new section on current trends in motor development that discusses the lifespan approach and dynamical systems perspective.
- Chapter 3, Social and Motor Development, has been supplemented with several new tables, figures, and photos, an expanded discussion of the concept of socialization and a new section on the exercise-aging cycle.
- Chapter 4, Perceptual-Motor Development, has much more information on the development of postural control and has been thoroughly updated.
- Chapter 5, Prenatal Developmental Concerns, has many new tables, including a comprehensive table indicating normal fetal development. New sections have been added on maternal diseases, HIV, cystic fibrosis, and diabetes mellitus. The sections on maternal nutrition and exercise during pregnancy have been expanded.
- Chapter 6, Effects of Early Stimulation and Deprivation, now includes a discussion of an important policy statement on infant exercise from the American Academy of Pediatrics, an expanded discussion of classic research conducted by Wayne Dennis, and even more examples of classic cases of extreme deprivation and its effects.
- Chapter 8, Physiological Changes: Health-Related Physical Fitness, now has many more tables as well as expanded information on developmental changes in heart rate. We have also included a section on the effects of exercise on prepubescents and have incorporated important position statements from prominent professional associations concerning children's weight training. Finally, new sections on the elderly and resistance training and gender- and health-related fitness have been included.
- Chapter 9, Movement and the Changing Senses, now provides information about several modalities other than just vision and includes major sections on such senses as proprioception and touch.
- Chapter 10, Infant Reflexes and Stereotypies, now has two new tables and a section discussing the difference between lifespan and infant reflexes.
- Chapter 11, Voluntary Movements of Infancy, has newly expanded sections on attainment of upright posture and early reaching and grasping behavior.
- Chapter 12, Fine Motor Development, includes a number of new photos as well as new sections on current interpretations of the development of prehension and some exciting research on early exploratory hand movements and the development of haptic perception.

- Chapter 13, Fundamental Locomotion Skills of Childhood, and Chapter 14, Fundamental Object Control Skills of Childhood, have been expanded and separated into two chapters for ease of reading. In addition to the many other fundamental locomotor skills included in the previous edition, Chapter 13 now includes developmental information on galloping, sliding, and skipping. Chapter 14 adds one-handed catching to the list of non-locomotor skills that were previously included. Finally, sections have been added concerning gender differences in overarm throwing and the effects of instruction on non-locomotor skills.
- Chapter 15, Youth Sports, now includes many new tables and updated data on children's participation in sports programs. New information is provided about why children participate, and the section on youth sports injuries has been updated and expanded.
- Chapter 16, Movement in Adulthood, now includes more information about adult postural control and a discussion of the classic work of Lehman and age-of-peak proficiency in various movement activities. More importantly, the work of Lehman has been updated to include the nearly fifty years of information since his work was completed. A section on physical activity trends through adulthood has also been incorporated.
- Chapter 18, Planning and Conducting Developmental Movement Programs, now includes sections on playground injuries with many new tables accompanying this information. A section has also been added to address the need for precaution in blood management.

ACKNOWLEDGMENTS

A special thanks to Mayfield Publishing for, again, guiding us through the publication process in a friendly and focused manner. We also appreciate their willingness, upon our request, to solicit many more reviews than usual. These reviews were particularly useful in our efforts to meet the needs of instructors and students of motor development. We're grateful for the constructive comments from all the reviewers: Beverly J. Allen, Alabama State University; Judy M. Bohren, University of Tampa; Allen Burton, University of Minnesota; Stephen E. Butterfield, University of Maine; Nancy L. Carleton, San Jose State University; Tami Benham Deal, University of Wyoming; John L. Haubenstricker, Michigan State University; Robert E. Kraft, University of Delaware; George Luedke, Southern Illinois University at Edwardsville; Louise S. McCormack, Plymouth State College; Sally McGrath, Shippensburg University; and Mary Painter, California State University at Northridge. One reviewer in particular surpassed all expectations. Dr. Allen Burton of the University of Minnesota provided us with supremely constructive comments with detailed rationale and references. Improvements in this edition are, in part, a function of Dr. Burton's critical insights into motor development.

We also acknowledge the work of Dr. Karyn Nelson of the University of Hawaii, who wrote large portions of our Instructor's Manual. Knowing Dr. Nelson's compassion as an instructor and her interest and expertise in motor development and written-test construction, we were always confident that our Instructor's Manual would be the quality we sought. Dr. Nelson produced a wide variety of carefully constructed test questions with many clever and creative assignments. All of our students will prosper from her work. Thanks, Karyn!

Lastly, we would again like to thank Dr. John Haubenstricker, Dr. Vern Seefeldt, and colleagues at Michigan State University for providing us with the research data and supporting studies pertaining to the "total body approach" for describing developmental sequences (presented in Chapters 13, 14, and 17). Although we had used these sequences in previous editions, we now include even more of the findings from the work conducted at Michigan State University. We would also like to again acknowledge that the film tracings that accompany much of this work were done by Dr. Joy Kiger, a former doctoral student at Michigan State. Dr. Kiger is now a faculty member at the University of Wisconsin, Whitewater.

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PART THREE: Physical Changes Across the Lifespan

PART FOUR: Movement Across the Lifespan