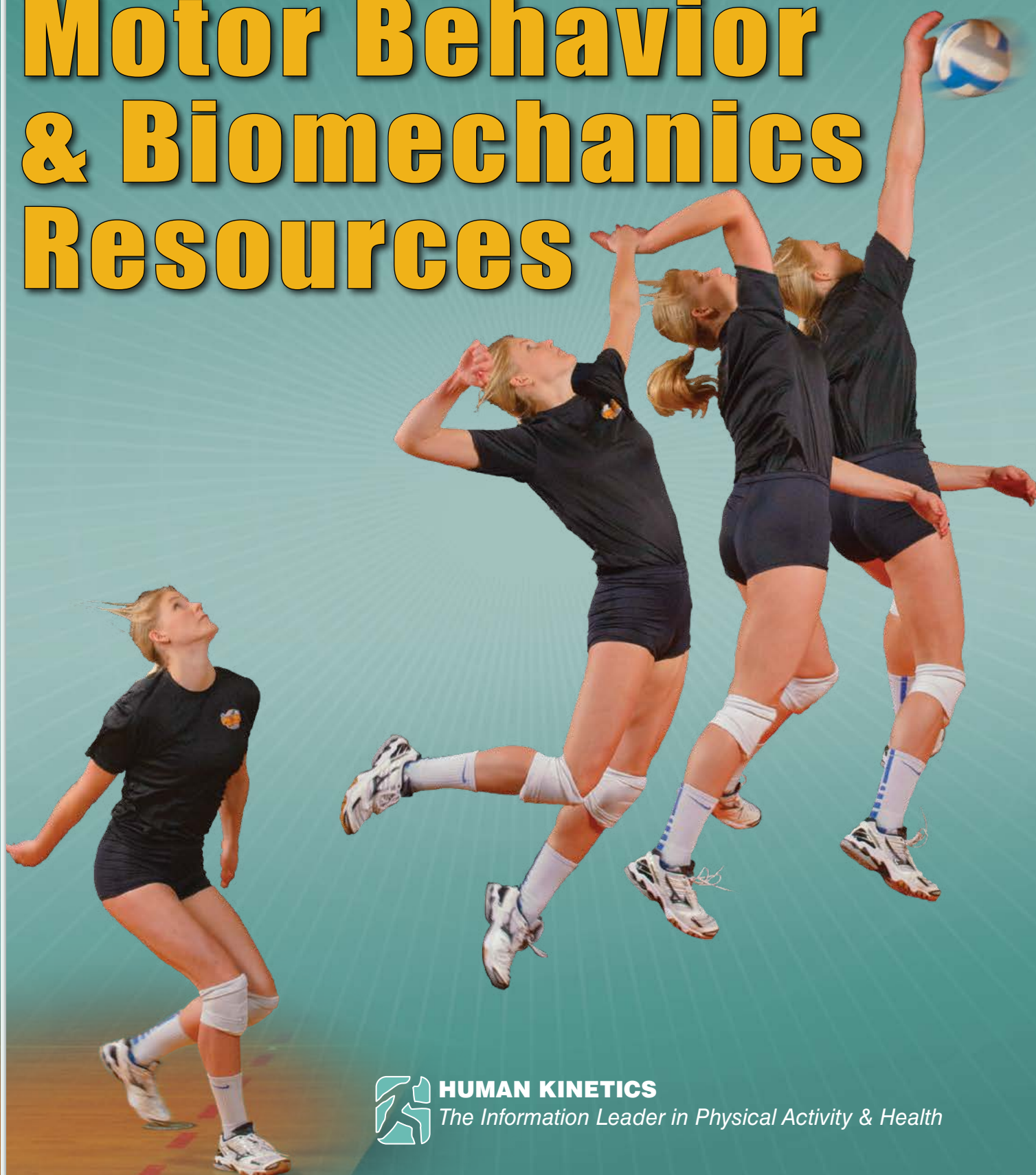


2013

# HUMAN KINETICS

## Motor Behavior & Biomechanics Resources



**HUMAN KINETICS**

*The Information Leader in Physical Activity & Health*

## A complete tool kit for teaching biomechanics

**Audiences:** Text for undergraduate biomechanics courses for students studying kinesiology, exercise science, physical education, or other human movement fields.

Taking a unique approach to the presentation of mechanical concepts, *Biomechanics of Sport and Exercise, Third Edition With Web Resource and MaxTRAQ Educational 2D Software Access*, introduces exercise and sport biomechanics in simple terms. By providing mechanics before functional anatomy, the book helps students understand forces and their effects before studying how body structures deal with forces. Students will learn to appreciate the consequences of external forces, how the body generates internal forces to maintain position, and how forces create movement in physical activities.

Rather than presenting the principles as isolated and abstract, the text enables students to discover the principles of biomechanics for themselves through observation. By examining ordinary activities firsthand, students will develop meaningful explanations resulting in a deeper understanding of the underlying mechanical concepts. This practical approach combines striking visual elements with clear and concise language to encourage active learning and improved comprehension.

*Biomechanics of Sport and Exercise, Third Edition*, is enhanced by access to a new web resource, which guides students through the process of solving 18 sample problems, and MaxTRAQ Educational 2D software for Windows. MaxTRAQ Educational 2D software enables students to analyze and quantify real-world sport movements in video clips and upload their own video content for analysis. The software supplements the final section of the text that bridges the concepts of internal and external forces with the application of biomechanics; it also provides an overview of the technology used in conducting quantitative biomechanical analyses. Access is included with new print books, or the software may be purchased directly from MaxTRAQ.

NEW EDITION!

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## Develop skills in qualitative movement diagnosis

*Qualitative Diagnosis of Human Movement: Improving Performance in Sport and Exercise, Third Edition With Web Resource*, organizes research-based knowledge into a simple theoretical structure supplemented with numerous examples of application. It introduces a four-task interdisciplinary model of qualitative movement diagnosis (QMD)—preparation, observation, evaluation and diagnosis, and intervention—and summarizes the development of this approach and the perceptual factors relevant to movement diagnosis. A chapter titled Theory-Into-Practice Situations provides case studies spanning a variety of movement, fitness, and sport settings. These case studies offer students support in developing their own plan to assist the subject

in the case study. Several other features such as QMD Technologies and QMD Demonstration sideboxes add more tools to show students how QMD can help clients in real-world sessions. New to this edition, a web resource replaces the CD-ROM, with more than 70 all-new video clips and follow-up questions to provide real-life examples to practice movement diagnosis.

### NEW EDITION!

## Analyze movement dysfunction for rehabilitation

*Clinical Mechanics and Kinesiology With Web Resource* provides a solid foundation so that students can understand biomechanics and functional anatomy as they relate to both normal and abnormal movement. Written by clinicians with more than 40 combined years of clinical and teaching experience, this text is also a practical reference for rehabilitation professionals. The text is enhanced with over 360 pieces of full-color art. Unique combination figures integrate detailed bone illustrations and photos. Medical art displays locations of bones, muscles, and ligaments. Arthrokinematic motions are clearly shown with the appropriate skeletal locations, making it easy for students to see

how a particular motion relates to the rest of the body. Included with each new text is a key code allowing students one-year access to the online anatomy program *Musculoskeletal Anatomy Review*. This engaging supplement offers a regional review of structural anatomy with exceptionally detailed, high-quality graphic images—the majority provided by Primal Pictures.

### NEW!



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## Biomechanics of Human Motion Series

The three volumes in this series will help advanced readers in human movement science gain a comprehensive understanding of the biomechanics of human motion as presented by one of the world's foremost researchers on the subject, Dr. Vladimir Zatsiorsky.

*"This is an excellent book for readers interested in building upon a basic understanding of biomechanics....In addition to the well-credentialed authors' expertise, important peer-reviewed research is presented throughout the book."*

—Doody's Book Review (5-star review)

### Research and practical applications in back care

Access research and applications to build effective prevention and rehabilitation programs with *Low Back Disorders: Evidence-Based Prevention and Rehabilitation, Second Edition*. Internationally recognized low back specialist Stuart McGill presents research to quantify the forces that specific movements and exercises impose on the low back, dispels myths regarding spine stabilization exercises, and suggests prevention approaches and strategies to offset injuries and restore function. This second edition provides enhanced algorithms to guide progressive therapeutic exercise and describes specially designed patient assessment provocation tests to help students assess back troubles and develop appropriate activities for functional gain.

### Details the intricacies of musculoskeletal injury mechanisms

*Biomechanics of Musculoskeletal Injury, Second Edition*, presents explanations of the biomechanical principles of injury and how injuries affect the normal function of muscles, connective tissue, and joints. Packed with more than 400 illustrations, including graphs and anatomical art, this edition offers perspectives on and appreciation for the intricacies of injury mechanisms. The text provides a solid foundation and thorough examination of the various aspects and factors involved in injury mechanisms in all body regions, and it serves as a comprehensive resource to assist health professionals, researchers, and students in the proper diagnosis, treatment, and prevention of musculoskeletal injuries.

### The relationship between structure and function

*Structure and Function of the Musculoskeletal System, Second Edition*, integrates anatomy and biomechanics to describe how the components of the musculoskeletal system coordinate to produce movement and adapt to the strain of everyday physical activity and the effects of aging. Illustrated with full-color detail, this unique resource will assist both future and current professionals in the diagnosis and treatment of musculoskeletal disorders by enhancing their understanding of the relationship between the structure and function of the musculoskeletal system.

### Learn the fundamental concepts of electromyography

*Essentials of Electromyography* is the perfect starting point for newcomers to EMG or as a solid reference for anyone already in a field associated with human movement. The text explains and explores the use of electrical recordings of muscle movements for students taking courses in EMG or any professional dealing with human movement. The authors have brought together critical information regarding the applications of EMG, analysis techniques, and the bioelectric and bioinstrumentation principles and hardware that are essential to using EMG. Numerous illustrations, diagrams, and glossary terms serve as an excellent guide through the text.



## Integrate biomechanics and neurophysiology

*Neuromechanics of Human Movement, Fourth Edition*, explores how the nervous system controls the actions of muscles to produce human motion in relation to biomechanical principles. This contemporary approach is much different from the traditional approach, which focuses solely on mechanics and does not consider the role of the sensory system in the control of human movement. Students will find an abundance of learning tools, including a glossary of terms and other appendixes that cover conversion factors and equations. Throughout, the content is visually reinforced with

more than 750 illustrations, including specific illustrations of the neuromechanics involved in sport and rehabilitation movements, and the text contains more than 1,500 updated references and suggested reading lists for each chapter.

## Build mastery in the study of movement

*Biomechanical Analysis of Fundamental Human Movements* focuses on mechanical concepts and activities in which the concept is implicated, helping to facilitate understanding of those activities. Superbly illustrated with more than 140 figures depicting the critical points of biomechanical analysis, this two-color text is an invaluable tool for those pursuing the study of advanced quantitative biomechanics. It presents a clear introduction to the principles that underlie all human motion and provides a complete study of fundamental

human movements and their components, offering students an understanding of human biomechanics that will enhance their ability to estimate or calculate loads applied to the body as a whole or induced in individual structures.

## Improve performance and prevent injury

*Applied Anatomy and Biomechanics in Sport, Second Edition*, offers a variety of information for coaches and sport scientists that can be integrated and applied to the elements of body structure, body composition, assessment, physiology, and biomechanics. Based on research findings and proven methods in developing optimal physical qualities for skilled performance, the text addresses nine distinct sport groups organized by common features. Students will learn to appraise the body structure of their athletes so that

strengths can be fully utilized and weaknesses improved. The text also considers growth, development, and gender to make students aware of mechanical overstresses that can impair performance and cause injuries.

## Essential resource in biomechanical research

*Research Methods in Biomechanics* is an invaluable resource for those wishing to hone their skills and learn new techniques in the collection, analysis, and interpretation of data. This text provides a firm foundation in the biomechanical methods and tools necessary for quantifying human movements. It shows how the laws of motion are applied to complex human movements, and demonstrates how to combine segments to obtain limb or total-body measures. All the material is presented in such a way that students need only basic knowledge of Newtonian mechanics and vector algebra to benefit.

**NEW EDITION COMING  
NOVEMBER 2013**

Extensive tables, reference materials, and other features enhance understanding of the material.

## Additional resources



## An engaging introduction to motor skill learning

*Motor Learning and Performance, Fourth Edition*, outlines the principles of motor skill learning, develops a conceptual model of human performance, and applies both concepts to a variety of real-world settings, including teaching, coaching, the design of performer-friendly equipment and work environments, rehabilitation, and everyday motor skill learning. Explanations of motor skill concepts and accompanying research are reinforced with examples of motor skill activities. By applying the concepts of motor learning to familiar scenarios, the material comes alive for students, leading to better retention of information and greater

interest in the application of motor performance and learning. Includes a companion online student study guide with lab activities that bring the material to life for students.

**NEW EDITION COMING  
NOVEMBER 2013**

## Motor development across the life span

*Life Span Motor Development, Fifth Edition*, is the only introductory textbook to use the model of constraints (or dynamical systems) approach in discussing reasons for changes in movement throughout the life span. This fully updated edition presents the principles of motor development in a clear and accessible manner for readers with minimal movement science background. The text also includes online access to 33 laboratories, 21 learning exercises, and more than 200 video clips that allow students

to examine the fundamental motor skills of infants, toddlers, young children, adolescents, and adults.

## Comprehensive introduction to motor control and learning

*Motor Control and Learning, Fifth Edition*, is an outstanding introduction to the field focused on motor behavior that can be observed directly as well as the many factors that affect the quality of these performances and the ease with which they can be learned. Additionally, the text examines some of the neurological and biomechanical processes that create complex movement behaviors, reflecting the convergence toward a shared understanding

of complex movement behaviors across the fields of motor behavior and motor learning, motor control, and biomechanics. Instructor resources help students grasp important concepts and prepare for exams.

## Critically analyze motor development research

*Advanced Analysis of Motor Development* is one of the few texts to analyze motor development models and theories while providing a context for advanced students in motor development. Students will learn to evaluate research methods and results as they deepen their understanding of developmental phenomena. For each category of movement skills covered, the authors first offer a survey of the pertinent research and then present an in-depth discussion of the landmark studies. In analyzing these studies, students will come to appreciate the detail of research and

begin to explore possibilities for their own future research.

*"This text meets the need for in-depth study in a more cohesive manner by presenting parallels and highlighting relationships among research studies that independent readings might not provide."*

—Doody's Book Review (5-star review)

## A student-friendly overview of the motor behavior field

Motor behavior is a fascinating field of study with real-world applications in a variety of careers. *Fundamentals of Motor Behavior* provides students with an excellent introductory-level look at the opportunities in this exciting area. Engaging and reader-friendly, the text will enable those with little or no background in motor behavior to see the objectives that researchers and practitioners in the field pursue, the career options available, and the education required for pursuing a career in the field. This book is part of Human Kinetics' Fundamentals of Sport and Exercise Science

series. The series helps students and professionals understand the basic topics, goals, and applications of the subdisciplines in kinesiology.

## Understand the relationship between visual perception and action

To interact with the environment, an individual must code, store, and translate spatial information into the appropriate motor commands for achieving an outcome. Working from this premise, *Vision and Goal-Directed Movement: Neurobehavioral Perspectives* discusses how visual perception, attention, and memory are linked to the processes of movement preparation and execution. Using research informed by neural imaging and magnetic brain stimulation, this text provides students with a better understanding of the neural foundations for goal-directed movement,

illustrates the flexibility of the human visuomotor system, and discusses how regulation of movements depends on the learning and developmental history of the performer.

## Real-world examples of motor control and learning

*Motor Control in Everyday Actions* presents 47 true stories investigating the phenomena of motor control, learning, and perception and action in sport, physical activity, home, and work environments. At times humorous and sometimes sobering, the stories in *Motor Control in Everyday Actions* illustrate the diversity and complexity of research in perception and action and motor skill acquisition. More than interesting anecdotes, these stories offer concrete examples of how motor behavior, motor control, and perception and action errors affect the lives of both well-known and

ordinary individuals in various situations and environments.

*"Lee's 47 narratives provide an unusual opportunity to use a more flexible problem-based learning approach."*

--Stephen J. Langendorfer, PhD  
Professor in the School of Human Movement, Sport, and Leisure Studies  
Bowling Green State University

## Also available

## Discover frameworks for understanding motor learning and development

*Motor Learning and Development* explains how motor development affects motor learning and provides a framework for establishing programs that facilitate skill acquisition for all learners. This first-of-its-kind undergraduate text serves as a primary resource for integrating this broad range of material within a single course. *Motor Learning and Development* examines the development of movement skill in humans from infancy to older adulthood and how differing motor, cognitive, and social abilities affect when, why, and how an individual learns motor skills.

Learning features in each chapter include an opening scenario, activity and lab suggestions, chapter summaries, and glossary terms. In addition, sidebars provide opportunities for readers to increase their understanding. Research Notes present accessible summaries of notable research in both fields, and Try This sections detail a simple task for students to perform during class or study. In addition, What Do You Think? questions promote critical thinking and encourage research-to-practice understanding of the material.

## An evidence-based program to develop perceptual-motor skills

*Perceptual-Motor Activities for Children: An Evidence-Based Guide to Building Physical and Cognitive Skills* provides a proven blueprint for improving perceptual-motor skills—the skills that require young learners to use their brains and their bodies together to accomplish tasks. When kids improve these skills, they not only improve their coordination and increase their body awareness but they also enhance their intellectual skills and gain a more positive self-image.

This 32-week program of 200 sequential station activities that will help pre-K and elementary school-aged children in various stages of development, particularly those who are lagging behind in their perceptual-motor skills. Developed and piloted by two educators, this program provides all you need to create a perceptual-motor learning laboratory for your students.

The station activities can be sequenced for building a lab or used independently for targeted skill development. They are formatted as activity cards that may be posted at the stations for easy reference. The activity cards include instructions and illustrations to help you set up quickly as well as skill criteria to enable you to informally assess your students' performances. With the activity cards handy, volunteers and even student aides can easily help with setting up and monitoring readily available activities. All of the activity cards may be downloaded and printed with the included web resource.

## Additional resources





## Neurophysiology of movements and disorders

*Neurophysiological Basis of Movement, Second Edition*, covers a wide range of topics, including movement disorders and current theories of motor control and coordination. By emphasizing the neurophysiological mechanisms relevant to the processes of generating voluntary movements, the text targets advanced undergraduates or beginning graduate students who want to better understand how the brain generates control signals and how the peripheral apparatus executes them. The text also presents six labs to help students perform experiments to

address typical “template” research problems, and one-minute drills and self-test questions encourage students to think independently and to test their knowledge as they read.

## Theoretical roots and practical applications

*Dynamics of Skill Acquisition* provides comprehensive analysis of the evolution of the constraints-led perspective, a recognized theory in motor learning and control. The book outlines a conceptual model of coordination and control within a multidisciplinary framework, and provides specific strategies of the constraints-led approach that address skill acquisition across a variety of professions, including teaching, coaching, and rehabilitation. By learning both the theoretical origins and applications for implementing a constraints-led approach to movement skill acquisition, students will gain

insights into how the organization of learning and rehabilitation environments produces more effective and efficient use of practice and therapy time and more positive motor skill acquisition experiences for learners.

## Examine variability across various disciplines

In *Movement System Variability*, internationally known scientists synthesize research in the study of variability in the human movement system and provide an in-depth, multidisciplinary analysis for researchers in human movement sciences and related fields. The unique dynamical systems perspective of *Movement System Variability* adds a theoretical interpretation to the role of variability in movement behavior. An array of scientific disciplines is represented in the text to offer insights into the nature and role of variability observed at different levels of analysis. This reference provides insights into the nature and function of

variability, and demonstrates how an understanding of variability can enhance the practice of educators, teachers, coaches, physiotherapists, and developmental specialists.

## Bringing empowerment to motor skill learning

*Ecological Task Analysis and Movement* presents the Ecological Task Analysis (ETA) model, which offers strategies for replacing authoritarian practices by promoting student choice and an empowerment approach to learning. The text not only helps researchers design methodologically sound studies to test ETA principles, but it also shows practitioners how to apply these principles in coaching, teaching, or therapy. *Ecological Task Analysis and Movement* connects philosophy, theory, research, and practice. It challenges those in the field to understand and apply ETA principles to create more inclusive

settings and greater cooperation between groups and individuals within groups. This book encourages readers to understand, discuss and debate, borrow from and fully use, and critique and further develop the ETA model.

## Research in sport, movement, and exercise sciences

*Kinesiology Review (KR)* stands alone in its focus on scholarly reviews from any and all of the kinesiology subdisciplines. This online quarterly journal serves the interests of those in all areas of study related to health and physical activity, including movement and exercise science, sport and exercise psychology, sports medicine, sport history, sociology of sport and physical activity, physical education pedagogy, athletic training, sport management, and physical and occupational therapy.

KR's broad coverage makes it a perfect source of information for faculty, researchers, and professionals who want to stay up to date on emerging research across the disciplines, as well as students who are starting their exploration of this fascinating field of study. Visit [www.KR-Journal.com](http://www.KR-Journal.com) for more information.

### *Kinesiology Review*

Jane E. Clark, PhD, Editor

**Frequency:** Quarterly (February, May, August, November)

**Current Volume:** 2 (2013)

**Online format ISSN:** 2161-6035

**Online format ISBN:** 978-1-4504-2388-5

## Explore the various subdisciplines of motor control

*Motor Control (MC)* provides a multidisciplinary international forum for the exchange of scientific information on the control of human movement across the life span, including issues related to motor disorders. To this end, MC publishes clinical, experimental, modeling, and theoretical studies from a variety of disciplines, including biomechanics, kinesiology, neurophysiology, neuroscience, psychology, physical medicine, and rehabilitation. The journal is expanding in scope to include more papers based on

modeling and experimental studies involving cells, tissues, and organ systems. Many of the articles in *Motor Control* focus on the field of voluntary movement, including a category of articles on the history of the field. Issues will continue to examine the controversial issue of motor synergies. Visit [www.MC-Journal.com](http://www.MC-Journal.com) for more information.

### *Motor Control*

Mindy F. Levin, PhD, PT, Editor

**Frequency:** Quarterly (January, April, July, October)

**Current volume:** 17 (2013)

**Online format ISSN:** 1543-2696

**Online format ISBN:** 978-0-7360-5213-9

## New research in physical, cognitive, and social domains

*Journal of Motor Learning and Development (JMLD)* aims to advance the understanding of movement skill acquisition and change across the life span. It provides a platform for innovative research related to factors that influence the learning or relearning of skills in individuals with various movement-related abilities and disabilities. JMLD also features high-quality studies that offer insight into training or therapeutic interventions that promote motor proficiency, or reduce

**NEW!** deficits and decline, in any age group. JMLD publishes original articles, including reviews and studies using experimental and nonexperimental designs, as well as psychological, neuroscientific, physiological, and biomechanical analyses that consider the various dimensions of movement learning and development. Visit [www.JMLD-Journal.com](http://www.JMLD-Journal.com) for more information.

### *Journal of Motor Learning and Development*

Gabriele Wulf, PhD, Editor

**Frequency:** Quarterly (March, June, September, December)

**Current Volume:** 1 (2013)

**Online format ISSN:** 2325-3215

**Online format ISBN:** 978-1-4504-5943-3

## Authoritative coverage of current issues in biomechanics

The *Journal of Applied Biomechanics (JAB)* is devoted to the dissemination of studies that use biomechanical strategies to advance the fields of sport, rehabilitation, injury prevention, and posture and movement. These areas of interest to JAB authors, editors, and readers are not limited to applications in humans but also include the structure, control, function, and state of animals and biological systems. The journal contains research articles, technical notes, review articles, and other

pertinent information highlighting current advances in the field. JAB publishes articles that pertain to research studies on the effect and control of the forces that act on and that are produced by the human body, and reviews on topics of applied biomechanics.

Visit [www.JAB-Journal.com](http://www.JAB-Journal.com) for more information.

### *Journal of Applied Biomechanics*

J.J. Trey Crisco, PhD

**Frequency:** Bimonthly (February, April, June, August, October, and December)

**Current Volume:** 29 (2013)

**Online format ISSN:** 1543-2688

**Online format ISBN:** 978-0-7360-5234-4



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