CHAPTER

2

The Academic Foundations of Exercise Science and Kinesiology

This chapter briefly examines the academic focuses of our field and then provides an overview of the major subdisciplines. The term *sport* is commonly used as a modifier for many of the disciplines, such as *sport history*. That title arose during the 1970s as the disciplines were being formed, primarily because the commonly accepted focus of study for the disciplines at that time was sport.

Today we are left with titles that are inaccurate because they are too restrictive. For example, *sport pedagogy* is not accurate because many teachers of children use movement education and very little sport. Thus, I use the term *movement pedagogy*. Many psychologists now use the term *exercise and sport psychology* rather than simply *sport psychology*.

I have used many of the more traditional names—not because I consider them most descriptive of each discipline but because they are familiar and traditional. This is a variation of the same problem we have regarding agreeing on a single name for our field.

The Primary Subdisciplines of Our Field

In recent decades physical education, exercise science, and kinesiology have developed a three-tiered academic face. All three tiers are not present at every college, although most schools offer at least two of them. Karl Newell describes the tiers as academic program thrusts, identifying them as professional, disciplinary, and performance.[1] In essence, one major prepares teachers, another prepares scholars, and the third prepares performers (such as athletes). However, sport performance is not a widely accepted educational goal. It is seen only in a few nations that use international sport as a public relations and marketing tool, as American universities use their athletic departments.

A more realistic picture of American university programs today is shown in **Figure 2.1**, which illustrates the three types of major programs in our field:

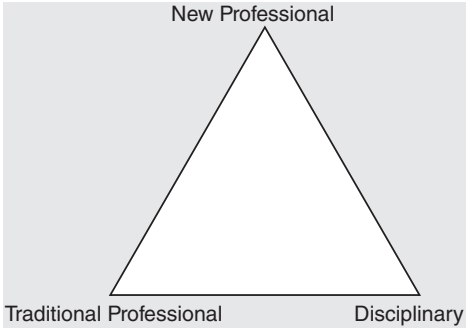

Figure 2.1 The primary academic thrusts of physical education

1. *Traditional professions*. Prepare physical education teachers and coaches, primarily for work in the school setting. Focus on the application of knowledge.
2. *Disciplines*. Prepare university students for research, medical, and health services jobs. Focus on research and the acquisition of knowledge. These jobs usually require further graduate or professional degrees.
3. *New professions*. Prepare students for jobs in exercise, fitness, and sport settings. This is the fastest growing area of the field.

The drawback of the discipline-based major has remained the same: There are few jobs for theorists, except in the research-focused university. Most students attend college to become trained for their life's work. Majors that do not offer that potential are losing students. The discipline may eventually gain more respect for the field, but it is the professions that will allow it to survive in its traditional range of interests.

The field of kinesiology takes a more limited view of our broader field, as reflected by its most accepted subdisciplines. As **Figure 2.2** shows, kinesiology generally includes only four primary subdisciplines, which were discussed in detail in an article titled "Kinesiology: Defining the Academic Core of Our Discipline," in a 2007 issue of *Quest*.[2] While kinesiologists will sometimes split the sociocultural foundations into sport psychology and sport sociology, sport psychology is the only subdiscipline commonly found in the kinesiology curriculum.

The fields of study or subdisciplines of our field are shown in **Figure 2.3**. Similar groupings have been suggested by other scholars. The figure shows the generally accepted subdisciplines within the academic field of exercise science and kinesiology and, at the same time, indicates their relationships to each other.

If we include movement pedagogy as a subdiscipline, we have eight recognized scholarly specialties within the field of physical education, exercise, sport, and kinesiology:

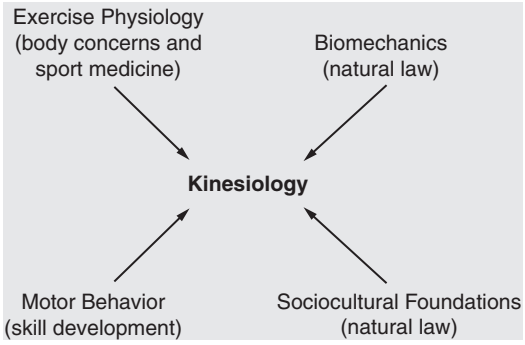

Figure 2.2 The subdisciplines of kinesiology

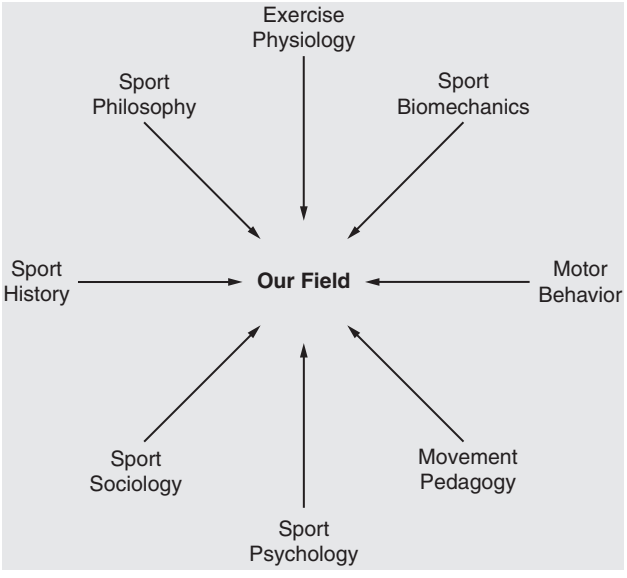

Figure 2.3 The subdisciplines of our field

1. Exercise physiology
2. Sport biomechanics
3. Sport psychology
4. Motor behavior
5. Sport sociology
6. Sport history
7. Sport philosophy
8. Movement pedagogy

These foundational areas of the field are its sociocultural, scientific, and pedagogical foundations. The focus of this chapter is not to summarize the content of each area, which is the function of specialized courses. Instead, it is to explain what each area studies, how that study is done, and why each area is important to an understanding of our field. The cultural foundations are our heritage in thought and deed, our philosophy, our history, our art, our literature. Physical education and sport are traditionally tied to the physical sciences, but the part played by the social sciences has become increasingly important. The scientific foundations are rooted in physical phenomena, and the social foundations are concerned with social phenomena. The most commonly accepted social sciences in our field are psychology, sociology, and history. The chapter also looks at motor behavior, which branches from psychology but includes aspects of the scientific foundations. Along with the science areas of biomechanics and exercise physiology, movement pedagogy is also considered.

Some writers expand the list of disciplines considerably, including such areas as sports medicine, sport management, and adapted physical education. I believe that the expanded lists simply reflect job options and subareas of disciplines, rather than new, separate subdisciplines. For example, adapted physical education can also be called a subarea of movement pedagogy because its focus is pedagogy applied to a distinct subgroup of people. If it is a separate subdiscipline, then so are elite sports, mature adult activities, youth sports, and kindergarten teaching. That view unfairly implies that some groups of people are more worthy of study or more important than other groups.

The cultural foundations are sport history and sport philosophy. These areas are sometimes called the sport humanities and can be expanded to include more specialized areas, such as sport art and sport literature. *Sport history* is the study of sport in the past. It shows us not only how sport developed, but also what was tried and either did not work or did not survive. It may help us to see better ways to do things, or at least help us to avoid the mistakes of the past.

Sport philosophy attempts to define and clarify sport and the sporting experience to determine the place and meaning of sport in our lives. The sport philosopher examines the sport setting so we can understand the circumstances under which sporting experiences take place. The critical elements of the experience itself are studied; that is, we study the elements that contribute to the experience. Finally, the broader meaning and implications of the experience are considered. In essence, the sport philosopher is concerned with what is significant about the sport experience.

The social foundations are sport sociology and exercise and sport psychology. Sport psychology and sport sociology examine human behavior in the sport setting. *Sport sociology* is concerned with the social behavior of people in the sport setting, both individually and in groups. This broad area is sometimes described as the sociocultural processes and institutions as they relate to and are affected by sport and sporting behavior. The sport sociologist focuses on the interaction

of people with each other in a sport setting to determine how the process of sport affects their development and socialization or how they fit into society.

Sport psychology covers two areas of interest: motor skill learning and motor performance. At issue are the psychological factors affecting the learning and performance of physical skills and the impact of both internal and external factors on individuals.

Motor behavior deals with the learning and improvement of physical skills. It originally developed parallel to sport psychology, but eventually it grew to cover its own more specific area of interests.

The scientific foundations are sport biomechanics and exercise physiology. These are the areas traditionally considered the hard sciences of our field. *Sport biomechanics* is concerned with the effects of natural laws and forces on the human body during sporting activities. It has developed from the traditional subject area of kinesiology, which is also the study of movement. Traditional kinesiology has two basic components: anatomical kinesiology (the construction and working mechanisms of the body) and mechanical kinesiology (biomechanics or the mechanics of the human body). In sum, sport biomechanics is the study of the movement of the human body and how the effects of the laws of physics apply to it.

Exercise physiology is devoted to how the body functions during exercise. The effects of training are a critical facet of sport physiology research. This makes it perhaps the most important of the sport studies from a practical point of view because it is concerned with all aspects of how the body adapts to exercise. At the same time, this area may include sports medicine, an important and growing area of study. Sports medicine integrates the treatment and prevention of athletic injuries.

Movement pedagogy is concerned with teaching, particularly teaching play and the skills used in sporting situations. It includes the study of teaching methods and many other elements tied to the concerns of the profession of physical education. Daryl Siedentop is one who calls for the inclusion of pedagogy in the disciplines, calling it "the youngest of the sport sciences."[3] This implies a pedagogy that is a science, rather than an art, a technocratic system using computers, new technologies, and systematic instructional evaluation methods. Ann Jewett, speaking on research progress in curricular studies, noted that

> *influence on performance has been limited to some extent by the overwhelming need for theory-building. A substantial effort has gone into the business of conceptualizing curriculum as a field of scholarly inquiry. . . . Those who conceptualize the area [of curriculum and instruction] as pedagogy tend to include additional professional sub-areas so that pedagogy is viewed as including curriculum, instruction, supervision, and administration.*[4]

Charles Corbin commented that both Siedentop and Jewett have correctly noted that the root of criticism of pedagogy as a discipline has been caused by two factors, the "lack of sound research methodologies and basic theories."

However, he cautions that the results of pedagogical research must be usable by the practitioners if they are to be of true value.[5] Movement pedagogy has immense potential value to the field of sport studies and performance.

Exercise Physiology

Focus

Exercise physiology is concerned with how the body reacts and functions during exercise. The effects of training are a critical facet of exercise physiology research, which makes it perhaps the most important of the sport studies because it is concerned with all aspects of how the body adapts to exercise. Exercise physiology includes the function and contraction of the muscles, the workings of the nervous system during physical activity, the functions of the respiratory system, and the workings of the cardiovascular system.

Exercise physiology also encompasses sports medicine, an important and growing area of learning. Sports medicine is the treatment and prevention of athletic injuries. In turn, this broad interest in the health of the physically active body also can include adapted physical education or developmental activities for the physically or mentally handicapped or disabled. The sports medicine specialist deals with preventive training, treatment, and equipment that assist the performer in staying healthy; nutrition, drugs, and ergogenic aids; the treatment and rehabilitation of injuries; and ethical matters related to the training, exercise, and treatment of athletes.

Major Topics of Study

Exercise physiologists are interested in topics such as muscular function, the nervous system and its operation, respiratory function, cardiovascular function, muscular strength and endurance, cardiovascular endurance, the effects of exercise, defining and measuring physical fitness, the development of fitness, the physiology of performance, and the effects of ergogenic aids (drugs and hormones) on the body. The major areas of research emphasis include the following nine topics, which can overlap:[6]

1. Substrate utilization during exercise
2. Kinetics of oxygen uptake
3. Anaerobic threshold
4. Efficiency of physical exercise
5. Factors limiting performance
6. Environmental influences on performance
7. Mechanisms of muscular weakness and fatigue
8. Physiological adaptations to conditioning programs
9. The role of endurance conditioning in the prevention of and rehabilitation from disease

Method of Research

The exercise physiologist most often conducts research in a physiology laboratory, using equipment such as treadmills, exercise bicycles, oxygen-measuring equipment, and equipment that measures chemical characteristics of the body. Computerized monitoring and measuring equipment continues to develop rapidly and exercise physiologists are required to be familiar with the developing technologies.

The exercise physiologist works in areas related to chemistry. An increasing amount of research is being done in the field, testing athletes where and when they perform, just as some sport psychologists have begun to do. The research of the physiologist is important, for the work cuts to the heart of the training system: Unless an athlete is trained to a fine edge and to the highest level, good mechanics and well-planned psychological preparation will not be enough to result in high-level performances.

Sport has been vividly depicted by artists in a variety of ways and mediums.

Research Outlets and Sources of Information

Groups interested in the study of exercise physiology include the American College of Sports Medicine (ACSM), which encourages and publishes research in that area; the American Society of Exercise Physiologists; the National Strength and Conditioning Association; and the National Athletic Trainers' Association (NATA).

The American Medical Association Committee on the Medical Aspects of Sports actively works with physicians and keeps them informed of matters relating to sports problems, injury, and treatment. The work of this committee has become especially important because of the greatly increased participation in competitive sports and the related rise in sports injuries. Many of those injuries are treated by doctors who normally do not work with sport-related injuries and rehabilitation. New groups are developing for those interested in the fitness business field.

Publications in the field include the *Research Quarterly for Exercise and Sport* (published by AAHPERD), the *Journal of Applied Physiology*, the *Exercise and Sports Sciences Reviews*, *Physiological Reviews*, *Medicine and Science in Sports and Exercise* (published by the ACSM), the *Physician and Sportsmedicine*, the *Encyclopedia of Sport Sciences and Medicine* (also published by the ACSM), the *International Journal of Sports Medicine*, *Sports Medicine*, and the *Journal of Cardiopulmonary Rehabilitation*. Many national and international conferences on the subject are held each year by different groups interested in exercise physiology.

The future of exercise physiology will probably include more coordinated studies with coaches to determine and monitor optimal training levels in exercise programs. Those studies will utilize testing of the cardiorespiratory system and of the athlete's blood chemistry. Much work in this area has already been done in the Soviet Union and eastern Europe.

The question of training and certifying people who work in the rapidly expanding fitness industry has caused extended debate.[7] The ACSM has provided the major leadership in this area, beginning certification programs in cardiac rehabilitation in 1975. Many private groups have started their own programs, with widely varied quality of results. Subgroups of the American Alliance for Health, Physical Education, Recreation and Dance (AAHPERD) are working to create their own certification programs for people such as exercise specialists. The certification situation is chaotic, with many groups offering certifications of widely varying quality. However, such programs are still required by only a small number of employers, weakening the potential for barring unqualified workers from the fitness field. The ACSM standards are the most widely accepted in the field.

Currently, much research is being conducted by exercise physiologists on the prevention of athletic injuries, the development of better programs to prepare people for exercise programs, and helping people to recover swiftly from injuries. At the same time, specialists are working to prepare more athletic trainers and to educate more doctors in sports medicine so that prevention and treatment are raised to a higher level in the United States. Exercise physiologists are increasingly involved in medical research.

Biomechanics

Focus

Biomechanics studies the effects of natural law and forces on the body in sport. It developed from the traditional subject area of kinesiology, which is also a study of movement. Kinesiology has two basic divisions: anatomical (concerned with the construction and working mechanisms of the body) and mechanical (biomechanics, or the mechanics of the human body). Kinesiology in this context is a broad term because it studies both the body parts and the physical laws that govern their movement. For this reason, biomechanics is sometimes called "mechanical kinesiology."[8] In sum, sport biomechanics is the study of the human body and how the laws of physics apply to it.

Major Topics of Study

Topics that cover the core elements of the discipline include the following:[9]

1. The measurement of motion (how to make it more accurate)
2. Errors in data collection (because moving objects are hard to measure with much accuracy)
3. Kinematic analysis (studying an object's motion independent of the force causing the motion)
4. Kinetic analysis (of both internal and external forces affecting an object's motion)
5. Body segment parameters (developing more accurate estimates or measures)
6. Modeling and simulation (to predict actual behavior)
7. Analysis of sports equipment

Anne Atwater discusses the topics of biomechanical interest in terms of themes, by which she means the broad focus of the researchers.[10] Each of these themes has different concerns, thus different topics of interest: biological sciences, ergonomics and human factors, engineering and applied physics, health sciences, and exercise and sport sciences. Atwater predicts that the future growth in biomechanics research will be in the following three areas:

1. Biomechanical mechanisms that generate and control movement
2. Adaptive mechanisms of biological tissues to different stimuli
3. Biomechanics of injury prevention

Method of Research

Research in biomechanics falls into two large categories: either the fundamental study of the process of simple movements or the analysis of motor skills, which are more complex and thus more pertinent to sport skills. Seven means of conducting biomechanics research are the use of cinematography, stroboscopy,

force platform studies, electrogoniometry, electromyography, telemetry, and computer-based studies.[11]

Cinematography uses motion picture photography to study movement. High-speed individual pictures are taken at timed intervals during a single continuing motion. *Stroboscopy* employs a similar photographic technique, except that an entire skill is captured in a single picture. A stroboscopic light flashes at preselected intervals of time during the performance. Only the positions of the action during the light flashes will show up in the picture, thus providing a representative view of the entire pattern of a motion.

A *force platform* measures the force pushing against it, such as the amount of push that a jumper uses in leaving the ground. It is used in studying the size and direction of forces, as well as their duration, and helps to give a clearer idea of the variables in performing skills such as the sprint start (measuring the time and amount of force exerted against the starting blocks and when each foot pushes and stops pushing).

Electrogoniometry records changes in joint angles using electrical instruments, giving a clearer idea of the sequence and ranges of motion that are used in performing a skill. *Electromyography* uses electrical instruments to record the work of muscles. It can tell what muscles are used in a skill, which muscles only assist with the skill, and what sequence of muscles is used in performing a complex skill.

Telemetry uses instruments to record electrical events in the body, which means any physical activity that can be converted into an electrical signal, such as a heartbeat. Small radio transmitters are then used to send the signal to recording instruments so that the performer can be studied while actually taking part in a normal performance, such as recording the heart activity of someone competing in a 1-mile race. The development of miniaturized electronics has allowed great advances in this type of research.

Computers can help to analyze complex skill performance. In fact, they can now be used to simulate skill activities. The mechanical characteristics of a performer, such as a discus thrower, can be fed into a computer and displayed on a screen, along with information on the thrower's performance. The computer can then simulate or predict how far the discus can be thrown if specific improvements are made in the thrower's technique. This gives the athlete a clearer idea of how a skill can be improved and the potential gain that might result from the improvement.

No description of studies in this area can be up-to-date because the research relies heavily on the instruments of current technology. Because that technology changes rapidly, it is impossible to describe the current capabilities in a textbook because a generation of a computer technology can begin and end between the start of writing and the actual publication of a book. As one example of the benefits of technology, we can manipulate the graphic images of a performance on-screen, seeing how much better the performer could have done under ideal circumstances.

The advances in the speed, power, and utility of microcomputers have gone far beyond our predictions; with the massive increases in memory and processing speed, we are increasingly able to simplify incredibly complex motion analyses. The speed with which technology advances makes predictions in this area meaningless. We can go far beyond the past in our capacity to record the actions of the human body, which allows us to monitor performance as it happens, analyze it, and give instant feedback.[12]

The motion analyses of biomechanics look at two aspects of motion study: kinetics and kinematics. *Kinetics* studies *what causes the movement of the body*, while *kinematics* studies *the resulting movement itself*. There are many other subareas within biomechanics, such as mechanics and dynamics, and even more specialized subdivisions, such as fluid mechanics, but these are better discussed in a biomechanics course. Kinetics and kinematics themselves are subdivisions of dynamics, which is simply the study of motion.

Early biomechanical research followed a qualitative model; that is, it tried to develop models of good technique, which people would then try to duplicate in their own performance. Of course, good is a value judgment, a subjective evaluation. Too often, the winning performer by objective standards (faster, farther, higher) was not best in terms of the good technique. Now research is along a quantitative model, using objective measures.[13] The performance is evaluated numerically, with specific points of measurement (not rating scales or other subjective measures). In terms of performance improvement, a person may have his or her movement patterns examined and tested by computer techniques, rather than compared to the model of another person's performance.

James Hay and Gavin Reid proposed a deterministic model of movement for analyzing performance.[14] The researcher first determines the performance goal or desired outcome. The researcher can then determine the factors that affect that outcome, then go on to determine the priority of those factors. Any factor may have component subfactors, which may themselves have subfactors. This model is increasingly used in research on elite performance because the factors can be interpreted in terms of training methods, as in periodization theory.

Research Outlets and Sources of Information

Many groups are concerned with sport biomechanics and hold meetings at the national and international levels to discuss research in the field. The International Society of Biomechanics (ISB) was founded in 1973, and the Olympic Scientific Congresses before each Olympic Games have offered a further outlet for research results. Members of the ACSM are involved in biomechanics research. The American Society of Biomechanics first met in 1977.

The ISB has a congress every 2 years and publishes the *International Series on Biomechanics*, with papers from each congress. The *Journal of Biomechanics* has been published since 1968. The *International Journal of Sport Biomechanics* (*IJSB*) began as a quarterly in 1985. The *International Series on Sports Sciences* (*ISSS*) includes volumes on biomechanical topics. The *Journal of Applied*

Biomechanics, *Journal of Human Movement Studies*, and the *Research Quarterly for Exercise and Sport* feature articles on biomechanics.

The future of biomechanics research will see more joint research projects with motor learning specialists, who are interested in determining how skills are learned and the most efficient teaching procedures, and with coaches, who are interested in improving the technical performances of athletes through scientific expertise and research capabilities. The sport training focus of biomechanics research was a conspicuous part of the successful eastern European athletics in the 1970s and 1980s, with the Soviet Union and the former East Germany leading the way in their application of research capabilities to athletic performance.

Steeplechasers show how sport has changed in facilities, organization, and the number of participants.

Sport Psychology

Focus

Sport psychology studies human behavior in the sport setting. In the realm of sport studies, psychology often has two aspects. Motor skill learning and performance (motor behavior) are common to both exercise science and sport. Sport psychology focuses on the psychological factors affecting the learning and performance of physical skills (how individuals are affected by both internal and

external factors). It includes how people learn physical skills (motor learning) and also the effects of different stimuli on the performance of those skills (sport psychology). It studies the effect on performance of such aspects as motivation, arousal, anxiety, personality, and social factors.

Sport psychology is a field that has become very influential. Sport psychologists in the Western world now work directly with athletes and teams, just as specialists did in preparing high-level athletes in the eastern European socialist countries in the 1970s and 1980s. Coaches, teachers, and parents are now more concerned about preparing athletes for highly skilled performance and protecting their emotional and psychological health because the psychological stress level of elite sport is very high.[15]

Major Topics of Study

Sports psychology investigates issues such as the nature of motor skills, performance and learning, and the psychological characteristics of the performer. Specific topics can include personality, attention and arousal, anxiety and intervention, motivation, and social aspects of performance. The only difference between those factors in the teaching situation and the coaching situation is the level of skill and intensity of the performer. Other topics include problems of burnout, injury, and retirement (both voluntary and forced) from sport. The study may be from the point of view of the researcher or the applied use of psychology to improve performance.

When people think of sport psychology, they usually think of performance enhancement, especially performance enhancement for elite athletes. Some of the topics of interest in performance enhancement are arousal, stress and anxiety, burnout and staleness, career counseling (especially the end-of-career situation), coaching behaviors, concentration and attention control training, injuries, mental training techniques and effectiveness, self-regulation techniques, and substance abuse by athletes and coaches.[16]

A second area is health psychology, which has two goals: (1) to help athletes maintain their mental health and (2) to encourage the general population to enjoy the psychological benefits of exercise. This field includes exercise-related topics such as altered states of consciousness, exercise addiction, exercise initiation and adoption, exercise adherence, mood benefits of exercise, runner's high, stress reduction, the therapeutic benefits of exercise, and self-concept, self-esteem, and self-efficacy.

A third area is social psychology, which studies social interactions in sport and recreational settings and includes the interests of sport sociologists and topics such as aggression, drug use and social sanctions, gender issues, social dynamics within teams, and youth sport.

Method of Research

Some sport psychologists debate the direction to be taken in sport psychology research, particularly in methodology. Rainer Martens calls for more emphasis on "field" research; that is, research that studies performance where it takes

place, on the track or playing field, rather than traditional laboratory research.[17] In the past, most research was done with individuals or groups in a laboratory setting that was carefully monitored, but today surveys and field observations are being used more often.

Standardized tests are used for many investigations of personality. Martens notes that sport psychologists spend little time actually studying sport or applied research. In response, he suggests the necessity of more theory-building work, which requires more time studying sport where and as it takes place. Martens does not call for the abandonment of laboratory research, but he is concerned about the ineffectiveness of sport psychology research on the world of sport:

> *Have you not wondered why sport psychology, as we know it, has had little to no influence on the world of sport? It is not because the coaches and athletes are unreceptive to information from our field; indeed they are eager for such information. It is, unfortunately, because our insights have not been challenging, the issues studied have not been critical, and our data are not convincing to the vital issues in sport. Thus, experiential knowledge and common sense have been more appealing, and usually more beneficial, than knowledge from sport psychology research.*[18]

Martens does add that field research can be just as erroneous as any other type of research, but he says that laboratory research often is not useful in the field situation. The essential problem is the complexity of human behavior. So many factors can affect a single situation that it may be impossible to determine how to change the factors if we want to increase or decrease some element of performance.

Daryl Siedentop agrees with Martens's suggestion that the field would be the best place for research in psychology and with the idea that new theories would be more likely to develop from field research that involves applied problems. However, Siedentop notes that "sport psychology will become more accepted in the 'field' if it adopts a more client-centered approach."[19] Sport psychologists reacted to this call for more applied research into the actual sporting practice instead of lab experiments that often bear little fruit in the field.

Sport psychologists still have much work to do in terms of field and laboratory research; actual work with coaches, athletes, and teams; the monitoring of programs, such as youth sports; and interpreting and teaching what they have learned to the teachers and coaches of the future.

Research Outlets and Sources of Information

The International Society of Sport Psychology (ISSP) was organized at the First International Congress of Psychology of Sport in Rome in 1965, and the North American Society for the Psychology of Sport and Physical Activity (NASPSPA) was founded in 1966. It first met at the 1967 AAHPERD convention, with

Arthur Slater-Hammel as its first president. The Association for Applied Sport Psychology (AASP) was founded in 1986.

Articles relating to sport psychology frequently appear in the *Research Quarterly for Exercise and Sport* and occasionally in *Quest*, but the primary scholarly publications are the *International Journal of Sport Psychology*, the *Journal of Sport and Exercise Psychology*, the *Sport Psychologist*, the *Journal of Applied Sport Psychology*, and the *Journal of Sport Behavior*. Studies also may appear in *Medicine and Science in Sports and Exercise*, the *Journal of Motor Behavior*, and *Perceptual and Motor Skills*. Research is presented at conferences and conventions of groups such as the NASPSPA, the AASP, the American Psychological Association (APA), and the ISSP. Occasionally, research may be presented at the conferences of related groups with a broader interest in sport, play, and exercise.

Motor Behavior

Focus

Michael Wade defines motor behavior as a subdiscipline that studies "how motor skill is produced."[20] It includes three subdomains: (1) motor control (how we control and coordinate our body), (2) motor learning (how we learn skills, including the variables that affect our learning), and (3) motor development (how our motor skills develop and change over time).

Motor development is concerned with physical ability and skill improvements that are primarily a result of maturation, and motor learning focuses on improvements that can be attributed primarily to practice and experience. Wade argues that the critical concept is skill because skill is what makes the difference between what we intend to do and what we succeed in doing.

Motor development is a branch of psychology, but it has developed several specialties. As Daryl Siedentop notes, "much of the early [research] was dominated by practical investigations. . . [since 1960], however, there has been much more theory-oriented research and gradual acceptance of an information-processing view of motor skill acquisition and performance."[21] Teachers were concerned with the most effective methods for teaching physical skills, so most of their earlier research tested specific methods or schemes of teaching. Gradually, researchers began to move toward formulating and testing theories of motor development and motor learning. The field of motor behavior is a very broad one, with a long historical background in psychology through its early interest in learning (not necessarily of physical skills). However, we are concerned primarily with physical skills, particularly those in the sporting situation.

Major Topics of Study

Numerous topics are important to the study of motor development and motor learning. Specialists in motor development study the following topics:[22]

1. *Heredity versus environmental influences in motor development*. This is the physical skill version of the traditional nature-or-nurture question. What is the influence of heredity on motor development, and what is the effect of the environment surrounding the learner?
2. *Relationships between age and sex and motor performance*. How does the expected motor performance level differ from one age or sex to another?
3. *Fundamental motor skill development*. What stages do people pass through when learning a given physical skill?
4. *Perceptual-motor development*. How does the coordination of a person develop, and what effect does coordination have on learning in other areas?
5. *Intelligence and motor performance*. Does the level of intelligence affect the speed of learning physical skills? Can the learning of physical skills raise a person's intelligence level?
6. *Cognitive processes and motor performance*. How does a person process information when learning physical skills? How much information can be processed?
7. *Physical fitness and children*. How does the fitness level of children differ from that of adults? Do exercise programs help children?
8. *Youth sports development*. What are the effects of youth sports programs on children? At what age are specific organized sports appropriate for children?

Research on motor learning includes the following topics:

1. *The stages of learning*. What are the steps and characteristics of the different stages of learning physical skills?
2. *Memory and motor performance*. What is the effect of memory on the learning of physical skills?
3. *Motor control*. How is the performance of physical skills controlled by the human body?
4. *Knowledge of results*. What is the most effective way to use knowledge of results in teaching physical skills?
5. *Practice conditions*. What are the most effective conditions for practicing physical skills?

Method of Research

Research in motor learning is becoming increasingly complex. Antoinette Gentile, in an overview of significant research during the 1970s, noted that the experimental tradition in motor learning in 1970 was still that of experimental psychology.[23] However, as more sharply focused theories and research topics appeared, experiments were based more on the methods of behavioral neurophysiology. For example, Michael Wade writes of the use of the "dynamical systems" approach that examines the person's motor control and coordination as a complex system "based on the concept that small changes in the organism can produce significant changes in motor behavior."[24]

Research Outlets and Sources of Information

Professional organizations concerned with motor behavior include NASPSPA and AASP. Some research is presented at meetings of the APA and of the ACSM. Publication outlets include the *Research Quarterly for Exercise and Sport*, *Human Movement Science*, the *Journal of Motor Behavior*, and *Perceptual and Motor Skills*. In addition, periodicals listed in sport psychology, and in some cases movement pedagogy, may feature some scholarly research in the field.

Sport Sociology

Focus

Sport sociology is concerned with the social behavior or organization of people in the sport setting, as individuals and as groups. This broad area is sometimes described as the sociocultural processes and institutions as they relate to and are affected by sport and sporting behavior. Sport is a significant part of our social order. It is often described as a "microcosm of society"; that is, a small-scale model of what the whole society is like. The sport sociologist studies "how the behavior of individuals and groups within sport is influenced by social relationships, past social experiences, and the social settings in which sport activities occur."[25]

Sociologists and sport sociologists make certain assumptions about the people whom they study; they assume that people are social beings, that their personal development is affected by social factors, and that they affect the social forms in which they live. In studying those assumptions in the sport setting, sport shows three patterns: It reflects culture and society, it reinforces social inequalities, and it is a vehicle for social conflict.[26]

Susan Greendorfer writes that

> *The subdiscipline. . . has undergone substantial transition during the past 30 years. . . research attention has shifted from the phenomena of play, games, and sport to more generic forms of physical activity as the study of body practices—from what was originally called sociology of sport to what some are now labeling "cultural kinesiology." What was once a discipline-based specialty (e.g., sociology) now appears to be shifting to an interdisciplinary approach where boundaries between the social sciences and the humanities (e.g., history, anthropology, literary analysis) are deliberately blurred. . . . Most sociologists of sport. . . agree that studies of sport and physical activity that are not also studies of societies where physical activity takes place are studies out of context.*[27]

Another direction in the focus of the subdiscipline is toward applied sport sociology, which was added as a research theme by the North American Society for the Sociology of Sport (NASSS) in 1985. The idea behind applied sport sociology is to make research more relevant and applicable to dealing with real-life problems and issues. Applied studies have the potential to help solve

problems and develop methods for dealing with the conditions and practices of sport. This added research direction is not unusual in the sport subdisciplines. Areas of applied sport studies have grown in sport psychology, biomechanics, and exercise physiology.

Major Topics of Study

Early research in sport sociology studied three aspects of society: basic social units (both individual and group), social processes (such as the development of social status or prestige within a group or community), and organizational structure (such as schools or other sport-related organizations).[28] At the same time, the important part played by sport in the schools and in the community requires that we learn as much as we can about how sport affects the social aspects of the growing process. We need that knowledge so we can use sport in the most beneficial way to help children grow into healthy, socially useful adults.

Areas of research in sport sociology include sport and social institutions (such as schools and politics), social stratification (how people fit into social classes or are classified socially by others), and socialization (how people or groups interact and are affected by each other). Among the many subtopics that are studied are sexual differences and roles, racism, religion, values and ethics, economics, politics, leisure and work habits, ethnic groups, and social change.

Small group topics include interactions among people and subgroups, leadership, socialization, traits of delinquency and aggression, social mobility, the relationship of morale and self-concept to success, and the development of character. At the same time, sport sociologists are concerned with developing better theories to define and explain sport and its effects in and on society, along with improving research techniques used in the field.

Some of the areas of research interest in sport sociology include the following topics, which are among the functions of sport in society and which can become negative as well as positive:[29]

1. Emotional release (in a socially acceptable way)
2. Affirmation of identity (development of a sense of personal identity)
3. Social control (development of conformity and predictability)
4. Socialization (establishment of common values and acceptable behaviors)
5. Change agent (social interactions, assimilation, and upward mobility)
6. Collective conscience (enforcement of patterns of proper behavior)
7. Success (a way to attain success through participation or spectating)

Robert Gensemer contends that much past research in sport sociology described the negative aspects of sport. Because we now have a broad understanding of that side of sport, future research should focus more on the impact of sport on lifestyles, values orientations, and sport's place in today's high-tech world. Susan Greendorfer suggests that the subdiscipline's focus is "shifting from one whose attention was solely devoted to the study of sport to one more inclusive of a broad range of physical activity phenomena."[30]

Method of Research

Social aspects of life are difficult to research because they provide little truly objective data. Group and individual behavior are studied by using sources such as interviews, official statistics (which often are based on subjective judgments), library and archival research, questionnaires, surveys, documents, direct observation, and controlled experimentation.[31] Such sources are rarely objective because they require the opinion of an individual or group to determine a status or change. As a result, sociological research results often are controversial.

More recent research is falling into two categories: normative and non-normative. Traditional research is normative and is handicapped by being value laden. That is, the researcher assumes that certain conditions are correct or proper, then examines what the real conditions are. Examples are an attempt to prove that sport builds character or that sport is unfair. Non-normative sport is value neutral and seeks to describe what is, rather than compare it to an assumed ideal. Of course, this is not easy to do, and it does raise some questions beyond its accuracy:

> *A very serious problem of the value-neutral approach is that it does not take sides; it takes the way things are as a given entity (neither good nor evil). Thus, research in the name of value neutrality supports the status quo. If racism, sexism, and drug abuse exist in sport, and if the athlete is being abused, it seems to us [Eitzen and Sage] that the researcher cannot remain neutral. We cannot remain morally indifferent to injustice.*[32]

However, Stanley Eitzen and George Sage remark that "although [we] have taken the position that value neutrality is impossible in the social sciences, the issue is not a simple one and has encouraged considerable debate."[33]

Greendorfer suggests another research shift during the 1980s and 1990s, from the "natural science model" of research to more "interpretive and critical forms of theory." She explains that "research is always subject to the researcher's consciousness, prevailing ideological beliefs, and historical conditions."[34] Thus, research can never be truly objective and value free because the researcher has his or her own preformed biases and values that affect how data are interpreted.

Andrew Yiannakis describes research in the applied sociology of sport as having three phases of application.[35] The first is the Applied Research Phase, which has two levels: the Explanatory Phase (giving the foundation for more specific research), and the Operational Research Phase (giving specific solutions to problems). The second phase of application is the Knowledge Transfer Phase—identifying and defining a problem, reviewing and assessing possible solutions, then recommending specific solutions. The third phase of application is the Implementation Phase—putting the recommendations into effect. During the third phase the sport sociologist becomes a change agent. This different role can create problems for researchers because it can destroy the objectivity that a researcher must have to be effective.

Research Outlets and Sources of Information

The Committee for the Sociology of Sport was an early branch of the International Council of Sport Science and Physical Education (ICSSPE), and it was followed by the International Committee of Sport Sociology (ICSS) in 1964. The ICSS conducts regular international sport sociology seminars. Professional groups that have some sport sociology research presented at their conventions include the NASSS, the American Sociological Association, the American Anthropological Association, The Association for the Study of Play (TASP), NASSH, and the Popular Culture Association.

Publications focusing on sport sociology research include *Sociology of Sport Journal*, *International Journal of Sport Sociology*, *Journal of Sport and Social Issues*, *Arena Review*, *Journal of Sport Behavior*, *Quest*, *Research Quarterly for Exercise and Sport*, and *JOPERD*. Some sport history meetings and periodicals publish studies of sport sociology in a historical context, such as whether sports participation was widely used in blending early immigrant groups into the existing communities in the United States. Some sport sociology studies may also be found in meetings and publications relating to sport psychology, sport philosophy, and popular culture.

Sport History

Focus

Sport history examines sport (and exercise science) in the past. With its concern about the who, what, when, where, how, and why of our field, sport history helps us to put the present into context. It shows us where we have been and how we got to where we are today, and it may indicate where we are going and what we will see when we get there. It can illuminate sport problems that need to be solved.

History is also related to philosophy. Although historians try to follow scientific methods in studying history, their most vital concern is not the scientific process or the use of provable fact, but the subjective process by which they decide what is important—what facts they will use, what each fact means, how the facts fit together, and how to present and interpret the chosen collection of facts. Although the process of history is in many respects scientific and objective, the result is largely subjective because each person's interpretation of a fact may be different. Each historian has a philosophy that is reflected in the way the research is approached and in the conclusions that are drawn.

Method of Research

There are two types of historical research: descriptive and interpretive.[36] Descriptive historical research is the early phase of historical study because it simply determines the facts of the matter—the *what* of history—and reports them. The first

historic works on a subject are usually descriptive. The more advanced (and more difficult) level of historical research is interpretive; it is an attempt to explain *why* something happened or what is important about an event or trend. Because evidence is both analyzed and interpreted, the issue of values and value systems is injected into the research process. Richard Swanson and Betty Spears divide the basic research questions into categories related to people (who and what), time (when and where), and curiosity (how and why).[37] As James Davidson and Mark Lytle point out, "History is rooted in the narrative tradition. . . it. . . remains dedicated to capturing the uniqueness of a situation." In short, they write, "good history begins with a good story."[38]

Sources for historical research can be primary or secondary. A primary source is the evidence of any person or thing that was present at the event being studied. It may be the diary of a person who was there, or it may be official records kept during the event. In short, it is firsthand information. A secondary source is someone who was not actually present when the event happened, such as a report by a person who interviewed one of the participants. Thus, it may be less reliable evidence.

Historical research involves three basic concepts: change, development, and progress.[39] *Change* is a simple concept, a difference from an earlier status or condition. Change can be documented easily because no values are involved. Either a rule did or did not change; the evidence is usually clear. *Development* is a series of changes in a direction; it, too, is simple to prove with evidence. The speed of change in a direction can range from slow (evolution) to fast (revolution). If it is consistent in a single direction, it can be documented to show a trend. Again, no values are involved. Simple facts can establish direction.

The third concept of historical research is *progress*, which requires value judgments and thus is less focused on facts. Change and development are descriptive ideas, but progress is always interpretive because it assumes that the change should be an improvement. One of the difficulties of historical research is that many ideas are based on the concept of progress, which Robert Nisbet says has been accepted for 3000 years of Western history. Yet, the validity of progress as a concept is beginning to be questioned because it is so value laden. As Robert Nisbet writes, "the idea of progress holds that mankind has advanced in the past—from some aboriginal condition of primitiveness, barbarism, or even nullity—is now advancing, and will continue to advance through the foreseeable future."[40]

This idea, clearly, is a value judgment, for one must first believe in the idea of progress. The concept is critical to sport because modern sport is concerned with records and breaking them. Only the belief in the idea of progress makes records worth keeping because they are goals to be surpassed.

Research Outlets and Sources of Information

The North American Society for Sport History (NASSH) was founded in 1973 and held its first convention at Ohio State University that same year. It meets

annually and publishes online *Proceedings*, which contains abstracts of the papers presented at the convention, along with the *Journal of Sport History*, which is published three times a year.

The names of sport history publications have been cited at length by Ronald Smith, with a shorter list by Darrell Crase in *JOPERD*.[41] The most commonly seen journals are NASSH's *Journal of Sport History*, *Sport History Review* (formerly the *Canadian Journal of History of Physical Education and Sport*), the *International Journal of the History of Sport*, and *Sport in History*. Sport history articles occasionally appear in *JOPERD* and the *Research Quarterly for Exercise and Sport*. Many sport historians are listed, along with their research interests, in an online directory compiled for NASSH.[42]

Sport Philosophy

Focus

Students sometimes wonder, What does a sport philosopher do? Because the work of the philosopher is mental and is not easily observed, it is a difficult role to describe. The sport philosopher attempts to define and clarify sport and the sporting experience to determine the place and meaning of sport in our lives.

William Harper suggests three reasons for the philosophical study of sport, pointing out that these reasons do not exhaust the possibilities.[43] The first reason is to discover what there is to know. In essence, we want to learn what we really know about sport, including play, games, exercise, and athletics. Our culture has many beliefs about sport, but which beliefs are really proven? Many of the popular ideas about sport have rarely been studied closely, such as the relationship between sportsmanship or character development and sports participation.

The second reason for studying sport philosophy is to guide practical action. Serious thinking about sport can provide answers that will be useful in planning the future direction of sport. Knowledge should be applicable to some purpose, if possible. This is an important function of some of the answers we may gain from sport philosophy: They can provide guidance for the future of sport.

The third reason is to produce a deeper understanding. Many of our sport studies are better described as merely wading into the shallows of sport, rather than as dredging the depths of the subject. Our knowledge and understanding of sport are minimal in comparison to what we really need to know. A deeper understanding of sport helps us to learn more about humanity—the essential condition of the peoples of the earth, their wants, and their needs.

Major Topics of Study

Scott Kretchmar describes the major topics of philosophical study in terms of the types of questions that are asked. He suggests five questions, each dealing with a branch of philosophy:[44]

1. Questions having to do with the nature of things (metaphysics)
2. Questions having to do with what people know (epistemology)
3. Questions having to do with the value of things (axiology)
4. Questions having to do with good behavior (ethics)
5. Questions having to do with what is beautiful (aesthetics)

When we think of philosophy, we usually think of *metaphysics*, or the nature of reality and being. Metaphysics tries to answer questions about what is real and what really exists, questions that cannot be answered scientifically.

Epistemology is the study of the theory of knowledge. It is an examination of how knowledge is gained and what kinds of knowledge can be obtained, or what can be learned and how it can be determined. It involves the processes of perception (how we see and understand things) and knowledge, including the process of learning, which we sometimes call *the scientific method*.

Axiology is the study of values in general terms. It involves the nature and kinds of values. We are most concerned with two specific subareas of axiology: ethics and aesthetics.

Ethics is concerned with morals and conduct, or determining proper rules of conduct. It is a study of ideal conduct and the knowledge of good and evil. It examines what actions are right and wrong, or what people should and should not do.

Aesthetics deals with the nature of beauty, which is very subjective. Earle Zeigler defined aesthetics as the "theory or philosophy of taste" because beauty is very much a matter of personal taste.[45]

Method of Research

Scott Kretchmar writes that "philosophy is valuable not only for the theories and propositions it produces but also for the thinking skills it requires." He goes on to explain that

> *the philosophic process is the art and science of wondering about reality, posing questions related to that wonder, and pursuing answers to those questions reflectively. It is an art and a science because the philosophic skills of wondering, posing questions, and searching for answers are grounded partly on repeatable methods that can be objectified and explained (science) and partly on intuitions, tendencies, and flashes of insight that can neither be fully predicted nor accounted for (art).*[46]

The question of method in philosophical studies is often confusing to the beginner. Ultimately, any philosophical question is subjective; empirical research is not possible because the phenomena are not observable. Indeed, Harold VanderZwaag and Thomas Sheehan state that "there is no common methodology for sport philosophers" primarily because of the highly individual nature of the process, although they do suggest that analysis and synthesis are the "two pillars of integrity" in philosophical research.[47]

Kretchmar writes of three analytical or reasoning techniques of philosophers: induction, intuition, and deduction.[48] *Inductive reasoning* is based on going from the specific to the general; that is, taking a specific situation or fact and drawing more general conclusions about it. Intuitive reasoning is based on being able to recognize a situation or fact and describe it without gathering further information. With *intuitive reasoning*, you can create and analyze situations in your mind. *Deductive reasoning* is based on going from the general to the specific; that is, taking a broad principle and trying to develop more specific information or guidelines from it.

The three basic approaches to philosophical study are speculative (suggesting possible answers to a question), normative (suggesting guidelines or norms), and analytical (evaluating the ideas of others). The areas or methods of philosophical study are the historical background study, the varied interpretation method, the value judgment, the clarifying of the main issues, and the determination of relationships to similar concepts.

The philosophical and the scientific methods of organizing research studies are very similar. However, we need to look at several other research methods to provide a broader exposure to the many possible approaches to philosophy. Kathleen Pearson suggests two research approaches that can be used as part of a brief self-study program.[49] The first is called the "goodness-of-fit approach" because it is similar to the statistical study that compares how closely two statistical models agree. In this case, the researcher takes a suggested paradigm or model (such as those for the relationships of play, games, sport, and athletics) and determines whether another example actually conforms to the suggested one. The second method is the "implications approach," in which the researcher studies what something would be like if it did conform to a given model, or the researcher studies the implications of such a condition.

Robert Osterhoudt suggests that the basic method used in philosophical studies is a systematic "dialectic," or dialogue, of either of two types: speculative or critical. He believes that both types are valuable because "without the speculative, philosophy would be reduced to logic [and] without the critical, [philosophy would be reduced] to poetry. Philosophy is wholly neither."[50]

Seymour Kleinman has argued against the idea of developing a "correct" theory of sport.[51] He suggests that theories put structure and limits on sport that close it to anything beyond its imposed bounds, whereas sport demands openness. Kleinman discusses three methods of theorizing: formal description, logical description, and phenomenological description. Formal description relates the properties or characteristics of a phenomenon, logical description studies how a term is used in the language, and phenomenological description analyzes the experience itself. The latter method is Kleinman's preference because it concentrates on the phenomenon as it actually happens, without limits.

Research Outlets and Sources of Information

The International Association for the Philosophy of Sport (IAPS), formerly the Philosophic Society for the Study of Sport (PSSS), was founded in 1972 at a regional meeting of the American Philosophical Association. The society, with its annual meetings and the annual publication of its *Journal of the Philosophy of Sport*, has led the way in promoting the philosophic study of sport and sport-related activities.

The major research outlets in sport philosophy are the annual meetings of the IAPS, its journal, the journal *Sport, Ethics and Philosophy* from England, and *Quest*, which is published by the National Association of Kinesiology in Higher Education (NAKHE). Some papers are given at annual conventions of the AAHPERD and NAKHE, and some articles appear in *JOPERD* and occasionally in the *Research Quarterly for Exercise and Sport*.

The Sport Humanities

Focus

The sport humanities are the fine arts side of the discipline. Unlike sport history and sport philosophy (which are also in the humanities but are major subdisciplines), it is not yet considered a subdiscipline, but it is an important area of interest in the field. The primary focal areas of the sport humanities are sport literature and sport art. Robert Pestolesi and Cindi Baker also include sculpture, dance, and music in this area. As they remark, "the concept of the fully educated person goes beyond the ability of an individual to function in a specified career path. The connection between the liberal arts and technology has vast implications for the impact of sport on our culture."[52]

The study of sport literature became an organized area in 1984 with the formation of the Sport Literature Association at a meeting in San Diego, California. They named their first meeting the Coroebus Conference in honor of the first recorded Olympic champion in ancient Greece. As Susan Bandy writes,

> *This alliance of sport and the arts is a curious one, one that no culture or civilization prior to the Greeks or since has been able to achieve. The source of this alliance stems from the philosophy which matured and governed much of cultural life as the Greeks progressed toward the Golden Age. This philosophy placed humanity at its center as the principal source of all truth and the principal object of all truth. The importance placed upon the human being resulted in a philosophy and a cultural ideal which affected all aspects of Greek life. This philosophy. . . [required people] to strive to be good, noble, learned, and beautiful, and later matured with the inclusion of arete, the striving for excellence, and aidos, honor, respect, and modesty.*[53]

This interest of sports people in the arts is related to the growth of interdisciplinary studies in many other areas of education and scholarship. Bandy describes the interest in the sport humanities as being recent, writing in 1988 that

> *only within the last two decades have the creative and artistic dimensions of sport been recognized by scholars in physical education. Prior to this time, sport was viewed primarily from biological, psychological, or sociological perspectives. With the interest in sport philosophy which began in the early 1960s and the more recent interest in sport literature, however, the creative and aesthetic dimensions of sport are being recognized.*[54]

In that same period, people interested in sport art were building an interest in that area by sponsoring small exhibits of sport art at the annual AAHPERD conventions. Robert Sorani was a leader in encouraging this exhibit. An early leader in teaching sport art was Hal Ray of Western Michigan University.

Major Topics of Study

The primary topics of study in the sport humanities are the interpretations of meaning and significance of sport literature and sport art. Scholars study the use of the arts to depict sport and to demonstrate aspects of the sport experience: "This perspective reveals the distinguishing feature of humankind—the basic human need and inclination to play; that is, to engage in and value things in-and-for themselves apart from their extrinsic and instrumental worth. From this, one can argue that this distinguishing feature of humankind is the basic source of art."[55]

Both sport literature and sport art include a performance dimension. Thus, scholars may *study* each area, but others are instead *producing* sport literature, especially fiction and poetry, and physical works of sport art in various media, including sculpture, paintings, photographs, and films.

Method of Research

As Susan Bandy writes, "Sport literature. . . has offered to the scholarly investigation of sport a more subjective view than. . . the other subdisciplines. In doing so, it, along with sport philosophy, has revealed the perspective that only the arts can provide."[56] The research methodology in sport literature is that of the field of literature, although studies in sport literature tend to be less strictly structured than studies for literature-related groups such as the Modern Language Association.

In sport art we find two approaches. The first is the study of sport art, which is subjective and interpretive, reaching into the other methodologies, such as sport history (for art of the past and present) and sport philosophy (for an understanding of the meanings that underlie the art). The second is performance, rather than scholarly study; people produce sport art to interpret their views of sport to other people.

Research Outlets and Sources of Information

The primary publication in sport literature is *Aethlon: The Journal of Sport Literature*, produced twice a year by the Sport Literature Association, which meets annually on college campuses across the United States. At this time there is no scholarly publication in sport art.

Movement Pedagogy

Focus

With the 1990s shift away from physical education and toward a redefined kinesiology as the scholarly focus of a broader, more unified field of study, the acceptance of a research-focused subdiscipline in pedagogy has grown. The distinction between the terms *physical education* and *sport pedagogy* is that physical education traditionally refers to school-related activities only, while sport pedagogy "is a broad field concerned with the content, processes, and outcomes of sport, fitness, and physical-education programs in schools, community programs, and clubs."[57]

However, I prefer the term *movement pedagogy*, which seems a more accurate name for the subdiscipline. In short, *movement pedagogy includes the study of any organized teaching or learning related to human movement, regardless of where the activity takes place*.

Movement pedagogy was a late-developing subdiscipline and grew as a result of the discipline movement's focus on scholarly research combined with prolonged criticisms of the quality of teacher education in physical education. As other subdisciplines began to produce scholarly research, the teacher education specialists in some of the larger university programs began to do more research on teaching methods and procedures.

No national organization for movement or sport pedagogy has developed at this time. Movement and sport pedagogy are a focus area at many physical education and sport conferences and conventions around the world.

Major Topics of Study

Daryl Siedentop lists five areas of study as the most common in movement pedagogy: teacher behavior, student behavior, teacher effectiveness, teacher issues, and curriculum.[58] Movement pedagogy has two primary divisions: instruction (which deals with the process of teaching, including assessment) and curriculum (which deals with the content of the program, including its goals, implementation, and outcomes). Few specialists work entirely in just one area because their interests overlap.

Method of Research

The basic research methods of movement pedagogy developed from those of motor behavior, more specifically called *motor learning* or *motor skill learning* at

that time. The proper method for research is not a matter of full agreement among specialists in movement pedagogy. For a fuller picture of the differing views on the methods of movement pedagogy, you should read a series of articles on the topic, "Research on Teaching in Physical Education," beginning with an overview by Stephen Silverman. The articles that follow all respond to Silverman's review, creating a forum for widespread discussion of research issues and methods.[59]

Research Outlets and Sources of Information

The movement pedagogy specialist has a wide range of research outlets, which also provide many sources of information. Many programs are held at the state, district, and national conventions of AAHPERD, including the several pedagogy-focused subgroups that meet at those conferences. Other conferences or conventions include research and presentations in movement pedagogy.

One such group is NAKHE. Another is the International Committee of Sports Pedagogy (ICSP), which is sponsored by four other groups that hold regular conventions: the International Association for Physical Education in Higher Education (AIESEP), the International Society for Comparative Physical Education and Sport (ISCPES), the International Federation of Physical Education (FIEP), and the International Association of Physical Education and Sport for Girls and Women (IAPESGW). Research is also presented at conferences on sport coaching education, coach certification, and the Olympic Scientific Congresses.

The first specialized research journal is the *Journal of Teaching in Physical Education* (*JTPE*), begun in 1981. Research on movement pedagogy also appears in the *Research Quarterly for Exercise and Sport*, as well as specialized journals such as those cited earlier in subdisciplines such as motor behavior.

Summary

This chapter examines the academic focuses of the field, then provides an overview of the major subdisciplines of kinesiology. The term *sport* is commonly used as a modifier for many of the disciplines because during the development of the disciplines in the 1970s, sport was the most accepted focus of study.

In recent decades physical education and kinesiology developed a three-tiered academic face. While they are often described as professional, disciplinary, and performance thrusts, a more practical picture of American universities shows three types of major programs: (1) the traditional professions (teaching and coaching careers), (2) the disciplines (research, medical, and health services careers), and (3) new professions (jobs in sport, exercise, and fitness settings).

Though scholars propose many subdisciplines, there are eight commonly recognized scholarly specialties within kinesiology: (1) exercise physiology, (2) sport biomechanics, (3) sport psychology, (4) motor behavior, (5) sport sociology, (6) sport history, (7) sport philosophy, and (8) movement pedagogy. Those areas are the scientific, sociocultural, and pedagogical foundations of the

field. The chapter explains what each subdiscipline studies, how that study is done, and why each area is important to an understanding of the field; it also lists professional groups and publications for each area.

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Discussion Questions

1. Give a brief description of the discipline of exercise physiology. Include a description of the area it studies, how it studies it, and the major topics it studies.
2. Give a brief description of the discipline of biomechanics. Include a description of the area it studies, how it studies it, and the major topics it studies.
3. Give a brief description of the discipline of sport psychology. Include a description of the area it studies, how it studies it, and the major topics it studies.
4. Give a brief description of the discipline of motor behavior and its three subareas. Include a description of the areas it studies, how they differ from each other, how the areas are studied, and the major topics of study.
5. Give a brief description of the discipline of sport sociology. Include a description of the area it studies, how it studies it, and the major topics it studies.
6. Give a brief description of the discipline of sport history. Include a description of the area it studies, how it studies it, and the major topics it studies.
7. What is the difference between descriptive and interpretive history? Why is interpretive history more advanced and difficult to do?

8. Three basic concepts involved in historical research are change, development, and progress. What are they, and why are they important concepts to the sport historian?
9. Give a brief description of the discipline of sport philosophy. Include a description of the area it studies, how it studies it, and the major topics it studies.
10. Give and discuss three of the characteristics of the sport experience, as suggested by VanderZwaag and Sheehan.
11. Give a brief description of the sport humanities. Include a description of the area it studies, how it studies it, and the major topics it studies.
12. Give a brief description of the discipline of movement pedagogy. Include a description of the area it studies, how it studies it, and the major topics it studies.

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