

# Recent Advances Related to Special Physical Education and Sport

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This article synthesizes advances related to special physical education and sport from 1975 to the present. Generic advances are presented within the categories of legislation, sport programs and activities, testing and assessment, certification, and instructional and curricular materials. Subsequently, additional advances particularly relevant to individuals with orthopedic, educational, auditory, or visual handicapping conditions are presented.

Since 1975, there have been many advances related to special physical education and sport which have relevance to professionals responsible for direct services. In this article, those advances are synthesized to help people who provide direct services to improve and/or expand programs designed for individuals with handicapping conditions. Described first are advances of a generic nature that are relevant to the full spectrum of handicapping conditions. These are followed by a synthesis of advances associated with specific or selected groups of handicapping conditions.

## Generic Advances

### Legislation

The year 1975 marked a major milestone relative to special physical education and athletics because that was when Public Law 94-142 was signed by President Gerald R. Ford. This law mandates that physical education, specially designed if necessary, be made available to all children and youth with handicapping conditions. It mandates that individual education programs (IEPs) be developed and include provision for physical education, that the education of youngsters with handicapping conditions be conducted in the least restrictive environment, and that equal opportunity be provided in extracurricular activities, including athletics. This legislation has provided legal impetus for mainstreaming thousands of youngsters and has influenced professional preparation, research, and direct services. Prompted by this legislation, professional preparation and research during recent years has focused upon individualizing instruction, techniques of integration, attitude formation and change, assessment, policies and procedures for placement, task analysis, behavioral management and analysis, sport and physical activity modification, legal and safety implications of mainstreaming, and other such topics.

Section 504 of the Rehabilitation Act of 1973 (PL 93-112), whose rules and regulations were developed by the Department of Health, Education, and Welfare in 1977,

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also has vast implications for special physical education and athletics. As discussed by Winnick, Auxter, Jansma, Sculli, Stein, and Weiss (1980), important applications of this law include equal opportunity for handicapped individuals to attain the same benefits in physical education and athletics as the nonhandicapped—that opportunity to be provided in the most normal/integrated setting possible—and the elimination of practices that deny accessibility.

The Amateur Sports Act of 1978 (PL 95-606) is another law that has and should continue to influence sport participation by individuals with handicapping conditions. This act has led to the establishment of a Committee on Sports for the Disabled (COSD) within the U.S. Olympic Committee (USOC). Organizations with membership on the COSD include Special Olympics, Inc., United States Amputee Athletic Association (USAAA), United States Association for Blind Athletes (USABA), National Association of Sports for Cerebral Palsy (NASCP), National Wheelchair Athletic Association (NWAA), American Athletic Association for the Deaf (AAAD), and the National Handicapped Sports and Recreation Association (NHSRA). This legislation was designed to encourage more and better involvement of handicapped individuals in sports by coordinating efforts in regard to their amateur athletic activity.

### Sport Programs and Activities

Because of special sport programs developed since 1975, individuals with handicapping conditions now have more varied sport opportunities in which to participate. In addition to sport activities provided by COSD membership organizations are those provided by other organizations (Winnick & Short, 1981). Wheelchair-bound persons may participate in sports such as basketball, bowling, tennis, marathon racing, football, golf, softball, motorcycling, aviation, kayaking, hunting, fishing, horseback riding, and water sports. Beep baseball, bowling, golf, and winter sports can be enjoyed by persons with visual handicapping conditions. Although there is no conclusive empirical evidence, it appears that the rate of progress in providing special sport opportunities in school-related programs has not been as great as in these nonschool programs. However, there has been some development relative to special athletic programs as a part of state high school and intercollegiate programs (Winnick & Short, 1981).

### Testing and Assessment

Considerable attention has been given to testing and assessment in special physical education. Among the norm-referenced tests that have been developed since 1975 are the Project ACTIVE tests of physical and motor ability (Vodola, 1978), the Bruininks-Oseretsky Test of Motor Proficiency (Bruininks, 1978), and the Project UNIQUE Physical Fitness Test (Winnick & Short, 1982). As a response to increased attention on severely and profoundly handicapped individuals, Jansma (1982) recommended several psychomotor tests to help teachers determine the present level of performance of developmentally low students. Content/criterion-referenced standards also gained attention and are used in several comprehensive programs related to special physical education. Two excellent examples are units in the I CAN program and the Special Olympics Sports Skills Instructional Program. In each of these, content/criterion assessment guides reflect skill hierarchies. Loovis and Erasing (1979) developed the Ohio State Scale of Intra-Gross Motor Assessment (SIGMA), a comprehensive system of assessing and programing gross motor involvement for children based on the use of content-referenced assessment.

## Certification

Much attention has also been given to state certification in adapted/special physical education since 1975 (terms such as endorsement, credential, and approval are also used). Based on their survey, Cowden and Tymeson (1983) found that eight states have some type of certification/endorsement/credential and 11 other states have either submitted a certification plan or are actively developing one. The eight states that currently possess some type of certification include Alabama, California, Georgia, Kansas, Louisiana, Michigan, Minnesota, and New Mexico. States who have either submitted a certification plan or are developing one include Massachusetts, Illinois, Missouri, Nebraska, North Carolina, Ohio, Texas, Nevada, Maryland, Kentucky, and Virginia. Various approaches to certification have been employed but they generally involve competencies or specific courses.

## Instructional and Curricular Materials

In recent years much effort has been placed on developing instructional and/or curricular materials. One of the most notable of these is the I CAN program designed under the leadership of Janet Wessel of Michigan State University (1976). I CAN is an objective instructional system designed to improve physical education services to handicapped populations. It includes instructional resource materials to guide the systematic teaching of a large variety of independent physical education content. Another very comprehensive program, the Sports Skills Instructional Program, was created by Special Olympics, Inc. (no date). A series of manuals provide comprehensive instructional and specific curricular materials according to sports areas. The program was initially designed for mentally retarded children and youth.

A teaching research curriculum was presented by Fredericks, et al. (1976) to provide teachers with a complete set of detailed task analyses they can use as a basic curriculum for moderately and severely handicapped individuals. The curriculum includes individual prescriptions for children concerning language, self-help skills, and motor and cognitive skills. Subsequent to this effort, Fredericks et al. (1980) presented a comprehensive curriculum to develop gross and fine motor skills. They indicate that their curriculum addresses behaviors that should be taught to all children of all handicapping conditions at the preschool level. Dunn, Morehouse, Anderson, Fredericks, Baldwin, Blair, and Moore (1980) have published one resource and are conducting additional work specific to physical education using the teaching-research approach.

Aquatic activities continue to be stressed in programs for individuals with handicapping conditions and many resources have been developed in recent years to enhance teaching in aquatic activities. Notable among these resources is the adapted aquatics text and companion manuals for aide and instructor (American Red Cross, 1977). In accord with the mainstreaming movement, Grace D. Reynolds, YMCA of Southwest Washington (Longview, WA), has provided national leadership in mainstreaming aquatic programs for the disabled through Project Aquatics Mainstreaming (Project PAM).

With greater attention given to preschool and early school youngsters, various instructional and/or curricular aids have been focused on this particular group. Littman and Leslie (1978) have developed a Physical Recreation Enrichment Program (PREP) emphasizing motor, socialization, and language development of preschool children. Its strong attention to play and gross motor development makes this program particularly relevant for professionals involved in physical education. The "Let's Play to Grow" program, created by the Joseph P. Kennedy Jr. Foundation (1977), has also been designed to develop basic, recreational, fundamental movement, outdoor, swimming, and sport skill abilities.

The PREP Play Program: Play Skill Instruction for Young Mentally Retarded Children (Watkinson & Wall, 1979) was developed to teach play skills to children who are moderately mentally retarded. This program's objectives include the development, implementation, and evaluation of physical activity curriculum materials based upon task analyzed sequenced instruction, analysis of individualized instructional strategies, and development of physical activity curriculum for group instruction designed to foster development of group-play skills.

An outstanding program developed in the 1970s, and now a nationally validated project, is Project Adventure (Rohnke, 1977). Although not specifically developed for handicapped persons, this project points to a broad range of natural outdoor activities that can and should be part of physical education programs for children with handicapping conditions.

## Specific Conditions

### Orthopedic Conditions

With more opportunity for greater involvement in sports by individuals with orthopedic impairments have come advances in equipment used by those participants. Adapted equipment available now includes bowling ramps, retractable handle bowling balls, outrigger skis, chair lifts, hand-driven ergometers and bicycles (and other toys), pulk sleds, adaptive devices for kayaking and canoeing, swivel chairs for boating, electrical reels for fishing, adapted lightweight foils for fencing, adapted reins, safety stirrups and safety boots for horseback riding, outrigger skate aids, wheelchair runners for skating, ski bras, and flip-skis (Adams, Daniel, McCubbin, & Rullman, 1982). Sport-chair technology has advanced to such an extent that not only has performance in sport been enhanced significantly but technology relative to nonsport chairs designed for daily use has itself been influenced.

Improvements in special athletic programs for participants with orthopedic conditions has resulted in spinoff benefits for instructional physical education programs. For example, classification systems, employed to equalize competition in sport programs, may be used in instructional physical education programs. The many adaptations in rules and equipment associated with special sport programs may be used in physical education as well as recreation programs designed for youngsters with orthopedic impairments. The unique sports and activities that have either been developed or modified in athletic programs can be included in instructional physical education programs. Among the more recently developed sports/activities developed or modified for individuals with orthopedic impairments are wheelchair cross-country biathlon, wheelchair trap shooting, wheelchair soccer, surface table tennis, two-bounce tennis, pulk skiing, prognostic slalom, precision javelin, club or softball throw, thrust kick, ramp, stick, or tether bowling, angling, wheelchair fencing, para-canoeing, para and quad-scutling, and putt-putt golf.

By the late 1970s and early 1980s more and more attention was being given to the study, measurement, and development of physical fitness and sport performance of individuals with orthopedic impairments. At Canada's University of Alberta, in Edmonton, a research and training center for the physically disabled was established in 1978 to provide physically disabled athletes and their coaches with technical information about sport fitness and training. The National Association of Sport for Cerebral Palsy has developed a monograph to help program leaders train participants for their sport programs. The monograph, which is already being revised, provides information on nutrition, con-

ditioning, and athletic performance. Winnick and Short (1982) as a part of Project UNIQUE tested 605 individuals with orthopedic impairments on several physical fitness tests and compared their performance with that of normal youngsters. These researchers also determined the factor structure of physical fitness, based on test items they administered, and have developed a physical fitness test based on the factor structure and other critical criteria.

Since 1975, many authors have made recommendations about physical activity for specific physical conditions. Winnick (1977) and Marley (1977) have presented information in regard to physical activity and asthma. Schleickorn (1977) demonstrated the value of physical activity in the life of a child with cystic fibrosis. In a very comprehensive analysis and synthesis, Weigel and Carlson (1975) discuss physical activity for the hemophilic, including specific recommendations regarding the development of coordination, sport skills, and physical fitness. Robertson (1977, 1980) has presented specific suggestions for implementing physical activity programs for youngsters with muscular dystrophy and spastic cerebral palsy, and Engerbretson (1977) has done the same concerning the diabetic.

### Educational Handicapping Conditions

Sport programs, testing instruments, specific methodological recommendations, and curriculum resources pertaining to mentally retarded children and youth have been characterized by further development. Curricular materials are no longer rudimentary but include comprehensive, field-tested and, in some cases, validated programs such as the I CAN program, the Sports Skills Instructional Program, the Teaching Research Curriculum, the Let's Play to Grow Program, the PREP Play Program, and Project ACTIVE. Comprehensive tests of physical and motor ability that have recently been developed specifically for and/or which may be used in assessing abilities of mentally retarded persons include the Motor Fitness Test for Moderately Mentally Retarded (Johnson & Londeree, 1976), the Project ACTIVE tests of physical and motor ability, and the Ohio State SIGMA.

Rarick and McQuillan (1977) conducted a comprehensive study to (a) determine the factor structure of motor abilities of moderately mentally retarded boys and girls, (b) develop a diagnostic test appropriate to the assessment of the perceptual-motor and gross motor abilities of these children, and (c) prepare guidelines for the development of curricular materials based on research results.

In regard to approaches used to deal with learning disabilities, Kirk and Gallagher (1979) state that task training, ability or process training, or a combination of the two continue to be the most popular approaches. Hammill and Bartel (1982) are among those who seriously question the usefulness of perceptual growth. They feel that if perceptual training is used, it should be used on individual children on a remedial basis rather than for all children in the name of readiness training. Concerning specific theories and practices, the sensory integration approach of Jean Ayres has received a great deal of attention in regard to remediating learning disabilities. However, her theory and practices have come under considerable attack by some prominent educators. On the basis of his review of research, Winnick (1979) concluded that:

Perceptual-motor ability, as measured by various perceptual motor tests, may be enhanced by carefully sequenced programs; visual-perceptual abilities are not the cause of all reading difficulties or all low scores in psychometric intelligence tests; improvement in perceptual ability does not necessarily lead to improvement in academic suc-

cess or in psychometric intelligence tests scores; pupils low in perceptual-motor ability may be successful in academic pursuits; the belief that sensory-motor or perceptual-motor experiences serve as a basis for academic and intellectual measures has not been conclusively demonstrated. (p. 463)

When they teach individuals identified as emotionally/behaviorally disturbed, physical educators, like all educators, are concerned about the management of behavior. Drug therapy has been one way of modifying or managing student behavior. Certain stimulants, including methylphenidate, have been found to increase attention to school work and improve child behavior, and they appear to be warranted when planning strenuous activity (Boileau, Ballard, Sprague, Sleator, & Massey, 1976; Wade, 1976). French and Jansma (1981) indicate that numerous maladaptive behaviors can be managed with drugs. However, these authors caution that the use of drugs is sometimes accompanied by side effects and these must be considered when planning safe and successful participation in physical education.

Behavior modification as a way of managing behavior has gained increasing attention as a useful approach for special physical educators. Jansma (1978) noted a significant decrease in inappropriate social behavior of adolescent males during the time spent in low probability activities when access to high probability (subject-selected) activities was used as a contingency reinforcer. In other words, inappropriate social behavior (e.g., tic behavior, asking excessive questions, and withdrawing) during experimenter-selected activities was decreased when subject-selected physical activity was used as a contingency. Loovis (1980), on the basis of his research, concluded that contingency reinforcement is successful in altering and facilitating acquisition of movement skill, reducing inappropriate behavior, and enhancing physical fitness. Dunn and French (1982) have presented five sequential steps to help special physical educators apply operant conditioning techniques to modify behavior. Step-by-step systematic approaches for the modification of behavior similar to the steps presented by these authors are often encompassed and associated with applied behavior analysis.

In recent years electromyographic (EMG) biofeedback has been advocated as a form of muscle relaxation. In view of this, Bhatara, Arnold, Lorance, and Gupta (1979) have reviewed the literature on the effectiveness of EMG biofeedback and compared it to muscle relaxation training. On the basis of their research and clinical experience, these authors indicate that there is not enough evidence to support the clinical use of EMG biofeedback in hyperkinesis and, if EMG biofeedback is useful, it may not surpass progressive muscle relaxation treatment of hyperactivity. These authors feel that the extra effort it takes to provide EMG biofeedback training is not justifiable in hyperkinesis. Gearheart (1981) suggests some potential value of certain procedures for some children. However, he feels that research must initiate more carefully constructed and controlled studies before the final word is given.

Finally, two more approaches for managing behavior which have been suggested by special physical educators, and which direct service providers may find useful, are transactional analysis (Jansma & French, 1979) and reality therapy (Jansma, 1980).

## Auditory Conditions

Research continues into the static and dynamic balance skills of children who are either deaf or hard of hearing. Lindsey and O'Neal (1976) found that deaf children fail significantly more tests of both static and dynamic balance skills than hearing children. In their study,

Brunt and Broadhead (1982) also found that performance on items of static and dynamic balance for both male and female deaf children was notably inferior to that of normal children at all chronological age levels. However, on several other items on the Bruininks-Oseretsky Test of Motor Proficiency, the performance of deaf children was comparable to that of hearing children. To enhance the integration of the hearing impaired into regular physical education programs, several authors have recommended specific ways of communicating to facilitate instruction. Eichstaedt and Seiler (1978) suggested 45 signs to enhance instruction in physical education; Schmidt and Dunn (1980) presented a system of symbols for communicating in physical education; Brunt and Dearmond (1981) presented minimal communication techniques to convey test instructions to hearing impaired persons.

Winnick and Short (1982) found that the factor structure of physical fitness of normal and auditory impaired children is similar. These investigators developed the Project UNIQUE Physical Fitness Test, which can be used by both groups. Individuals with auditory impairments take the same items, and except for the sit-up, use the same norms as normal peers. Winnick and Short (1982) found that generally no significant differences existed between hard-of-hearing and deaf individuals on test items. On the other hand, educational environment was found to be a significant factor on performance of several physical fitness items. On test items in which significant differences occurred, performance of non-institutionalized subjects was inferior to the performance of institutionalized subjects.

### Visual Conditions

A significant milestone in physical education and sport for the blind occurred in 1976 when, for the first time, these individuals were included in the Olympiad for the Physically Disabled. Following this initial involvement, the United States Association for Blind Athletes (USABA) was developed to promote and sponsor athletic competition for the blind in the United States. In order to equalize competition, the USABA developed three (rather than the traditional single) classifications of blindness. The three classifications range from the totally blind to those with visual acuity of 20/200. An activity that has rapidly developed as a part of USABA competition is goal ball. The object of the game is to roll a ball with bells past opposing players and across an endline while opponents attempt to stop the ball and, in turn, roll it across the opposite endline.

Another game that appears to be gaining popularity is beep baseball (Winnick & Short, 1981), which is currently being promoted and sanctioned by the National Beep Baseball Association (NBBA). Players in the game attempt to hit a beeping ball pitched by a sighted player on their own team. Once a fair ball is hit, players run to cone shaped bases which emit sounds. Runs are scored if players reach base before defensive players clearly field the ball.

Winnick and Short (1982) studied the physical fitness of children and youth with visual handicapping conditions, and reported several important findings. For example, physical fitness performance scores of sighted subjects were found to significantly exceed those of youngsters with visual impairments when significant differences between the groups existed, and visually impaired institutionalized subjects were often found to be superior to non-institutionalized visually impaired subjects in their physical fitness performance scores. The authors also found similarities between the physical fitness factor structure of sighted and visually impaired youngsters, and they developed a physical fitness test appropriate for both visually impaired and sighted youngsters. In the test, certain items must be modified for youngsters with visual impairments. Separate norm tables must be

used when test items have been modified and when classifications of visually impaired youngsters differ significantly from those of sighted peers. For example, norm tables are separated for assisted and unassisted participants and for partially sighted and blind participants for the dash and long-distance runs.

### Closing Statement

The information presented in this article has identified several major advances pertaining to special physical education and sport. Hopefully, this information will update direct service providers and demonstrate that special physical education and sport have come a long way since 1975. Those involved in advocating and providing physical education and sport services should feel a sense of accomplishment. Yet, although much has been accomplished, certainly much more progress must be made if children and youth with handicapping conditions are to receive the opportunities to which they are entitled. It is hoped that those who write about advances in the next 10 years will also have much to report about progress in special physical education and sport.

### References

- Adams, R.L., Daniel, A.N., McCubbin, J.A., & Rullman, L. (1982). *Games, sports and exercises for the physically handicapped*. Philadelphia: Lea & Febiger.
- American Red Cross (1977). *Adapted aquatics*. Garden City, NY: Doubleday & Co.
- Bhatara, U.L., Arnold, L.E., Lorange, T., & Gupta, D. (1979). Muscle relaxation therapy in hyperkinesis: Is it effective? *Journal of Learning Disabilities*, **12**, 182-186.
- Boileau, R.A., Ballard, J.E., Sprague, R.L., Sleator, E.K., & Massey, B.H. (1976). Effect of methylphenidate on cardiorespiratory responses in hyperactive children. *Research Quarterly*, **47**, 590-596.
- Bruininks, R.H. (1978). *Bruininks-Oseretsky Test of Motor Proficiency*. Circle Pines, MN: American Guidance Service.
- Brunt, D., & Broadhead, G.D. (1982). Motor proficiency traits of deaf children. *Research Quarterly for Exercise and Sport*, **53**, 236-238.
- Brunt, D., & Dearmond, D.A. (1981). Evaluating motor profiles of the hearing impaired. *Journal of Physical Education, Recreation, and Dance*, **52**(9), 50-52.
- Cowden, J., & Tymeson, G. (1983). Certification in adapted/special physical education: National status. *National Consortium on Physical Education and Recreation for the Handicapped. Newsletter*, **11**, Spring, 8-10.
- Dunn, J.M., & French, R. (1982). Operant conditioning: A tool for special physical educators in the 1980s. *Exceptional Education Quarterly*, **3**(1), 42-53.
- Dunn, J.M., Morehouse, J.W., Anderson, R.B., Fredericks, H.D.B., Baldwin, V.L., Blair, F.L., & Moore, B. (1980). *A data based gymnasium: A systematic approach to physical education for the handicapped*. Monmouth, OR: Instructional Development Corporation.
- Eichstaedt, C.B., & Seiler, P.J. (1978). Signing. *Journal of Physical Education and Recreation*, **49**(5), 19-21.
- Engerbretson, D.L. (1977). The diabetic in physical education, recreation and athletics. *Journal of Physical Education and Recreation*, **48**(3), 18-21.
- Fredericks, H.D.B., et al. (1980). *The teaching research curriculum for moderately and severely handicapped: Gross and fine motor*. Springfield, IL: Thomas.
- Fredericks, H.D.B., et al. (1976). *The teaching research curriculum for moderately and severely handicapped*. Springfield IL: Thomas.



- French, R., & Jansma, P. (1981). Medication, learning disabilities and physical education. *American Corrective Therapy Journal*, **35**, 26-30.
- Gearheart, B.R. (1981). *Learning disabilities: Educational strategies*. St. Louis: C.V. Mosby.
- Hammill, D.D., & Bartel, N.R. (1982). *Teaching children with learning and behavior problems*. Boston: Allyn & Bacon.
- Jansma, P. (1978). Operant conditioning principles applied to disturbed male adolescents by a physical educator. *American Corrective Therapy Journal*, **32**, 71-78.
- Jansma, P. (1980). Reality therapy: Another approach to managing inappropriate behavior. *American Corrective Therapy Journal*, **34**, 64-69.
- Jansma, P. (1982). Physical education for the severely and profoundly handicapped. *Exceptional Education Quarterly*, **3**, 35-41.
- Jansma, P., & French R. (1979). Transactional analysis: An alternative approach to managing inappropriate behavior. *American Corrective Therapy Journal*, **33**, 155-162.
- Johnson, L., & Londeree, B. (1976). *Motor fitness testing manual for the moderately mentally retarded*. Washington, DC: American Alliance for Health, Physical Education, and Recreation.
- Kennedy, J.P. Jr. Foundation (1977). *Let's-play-to-grow*. Washington, DC: The Foundation.
- Kirk, S.A. & Gallagher, J.J. (1979). *Educating exceptional children*. Boston: Houghton Mifflin.
- Lindsey, D., & O'Neal, J. (1976). Static and dynamic balance skills of eight-year-old deaf and hearing children. *American Annals of the Deaf*, **121**, 49-55.
- Littman, K.G., & Leslie, L. (1978). *Preschool recreation and enrichment programs (PREP)* (3 volumes). Washington, DC: Hawkins & Associates.
- Loovis, E.M., (1980). Behavior modification: Its application on physical education/motor development for children with special needs. *American Corrective Therapy Journal*, **34**, 19-24.
- Loovis, E.M., & Ersing, W.F. (1979). *Assessing and programming gross motor development for children*. Loudonville, OH: Mohican Textbook Publ.
- Marley, W.P. (1977). Asthma and exercise, a review. *American Corrective Therapy Journal*. **31**, 95-102.
- Rarick, G.L., & McQuillan, J.P. (1977). *The factor structure of motor abilities of trainable mentally retarded children: Implications for curriculum development*. Berkeley; Department of Physical Education, University of California: Final Report, Project No. H23-2544, for the Department of Health, Education, and Welfare, U.S. Office of Education, Bureau of Education for the Handicapped.
- Robertson, B.L. (1977). A therapeutic program for muscular dystrophy. *American Corrective Therapy Journal*, **31**, 70-74.
- Robertson, B.L. (1980). A therapeutic program for the spastic child. *American Corrective Therapy Journal*, **34**, 102-104.
- Rohnke, K. (1977). *Cowstails & cobras*. Hamilton, MA: P.O. Box 100, Project Adventure, Inc.
- Schleichkorn, J. (1977). Physical activity for the child with cystic fibrosis. *Journal of Physical Education and Recreation*, **48**(1), 50.
- Schmidt, S., & Dunn, J. (1980). Physical education for the hearing impaired: A system of movement symbols. *Teaching Exceptional Children*, **12**, 99-102.
- Special Olympics, Inc. (n.d.). *Sports skills instructional program*. Washington, DC: 1701 K Street N.W., Suite 203, Author.
- Vodola, T.M. (1978). *Developmental and adapted physical education: A.C.T.I.V.E. motor ability and physical fitness norms: For normal, mentally retarded, learning disabled, and emotionally disturbed individuals*. Oakhurst, NJ: Township of Ocean School District.
- Wade, M.G. (1976). Effects of methylphenidate on motor skill acquisition of hyperactive children. *Journal of Learning Disabilities*, **9**, 443-447.
- Watkinson, E.J., & Wall, A.E. (1979). *The PREP play program: Play skill instruction for young mentally retarded children*. Edmonton, Alberta: Physical Education Department, University of Alberta.

- Weigel, N., & Carlson, B.R. (1975). Physical activity and the hemophiliac: Yes or no? *American Corrective Therapy Journal*, **29**, 197-205.
- Wessel, J.A. (1976). *I Can implementation guide: Teaching physical education and associated learning skills in the least restrictive alternate settings*. Northbrook, IL: Hubbard.
- Winnick, J.P. (1977). Physical activity and the asthmatic child. *American Corrective Therapy Journal*, **31**, 148-151.
- Winnick, J.P. (1979). *Early movement experiences and developments; habilitation and remediation*. Philadelphia: W.B. Saunders.
- Winnick, J.P., Auxter, D., Jansma, P., Sculli, J., Stein, J., & Weiss, R.A. (1980). Implications of section 504 of the rehabilitation act as related to physical education instructional, personnel preparation, intramural, and interscholastic/intercollegiate sport programs. *Practical Pointers*, **3**(11), 1-20.
- Winnick, J.P., & Short, F.X. (1981). *Special athletic opportunities for individuals with handicapping conditions*. Brockport, NY: SUNY College at Brockport, Physical Education Dept.
- Winnick, J.P., & Short, F.X. (1982). *The physical fitness of sensory and orthopedically impaired youth*. Project UNIQUE Final Report. Brockport, NY: SUNY College at Brockport, Physical Education Dept.
- Winnick, J.P., & Short, F.X. (1984). The physical fitness of youngsters with spinal neuromuscular conditions. *Adapted Physical Activity Quarterly*, **1**(1), 37-51.

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