Adapted Physical Activity Research: Issues and Recommendations

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To successfully conduct quality research, professionals in adapted physical activity (APA) must address a number of unique and challenging issues. These issues include difficulty in acquiring large and homogenous samples; developing valid, reliable, and commercially available test instruments and protocols specific to persons with disabilities; properly training doctoral students to conduct quality research; and maintaining a specific research focus. With regard to these issues, this paper provides the following recommendations: utilize alternative research designs; acquire adequate graduate research training; develop a research focus as an adapted physical activity researcher; and promote an interdisciplinary, collaborative research effort among professionals. Most important, through continued scholarly research adapted physical activity professionals will be able to expand the scientific body of knowledge.

Adapted physical activity (APA) has undergone dramatic changes and growth since the passage of PL 94-142. One of the major responsibilities of APA professionals is active participation in the change process (Eichstaedt & Kalakian, 1987; Sherrill, 1988). If adapted physical activity is to continue to expand its scientific body of knowledge and attract new scholars, APA professionals must implement and disseminate quality research. Researchers in APA are faced with a number of challenges in conducting viable research. The purpose of this paper is twofold: (a) to provide an overview of issues affecting quality APA research and (b) to discuss recommendations for overcoming the challenges these issues present.

Issues Affecting Quality Research

This section will discuss the following four issues related to conducting quality research: difficulty in acquiring large and homogenous samples; developing valid, reliable, and commercially available test instruments and protocols specific to...
persons with disabilities; training doctoral students to conduct quality research; and maintaining a specific research focus.

**Acquiring Large and Homogenous Samples**

A unique issue facing adapted physical activity researchers relates to the availability of sufficient sample sizes of persons with disabilities. To date, many research questions remain unanswered because of the difficulty in securing large and homogenous samples. Due to the passage of federal and state laws, the once large sample sizes conveniently housed in state institutions are no longer available (DePaepe, 1988).

Even after extensive recruitment of subjects, a researcher may still be left with an insufficient sample size due to the heterogeneity of subjects categorized under the same medical label. In other words, potential subjects may have the same medical diagnosis but differ in degree of pathology, body regions involved, secondary disabilities, secondary medical complications, or types of medications taken. In this situation, responses observed during data collection may vary so widely that the standard deviations of the scores become enormous, rendering any subsequent statistical analyses and conclusions meaningless.

For example, the physiological responses to exercise of persons with paraplegia and quadriplegia due to spinal cord injury are quite different and therefore the two groups should be classified separately in investigations (Gass & Camp, 1979; Wicks, Olridge, Cameron, & Jones, 1983). Multiple sclerosis, cerebral palsy, acquired brain injury, autism, mental retardation, and learning disabilities are other examples of disabilities that result in varying amounts of functional loss among individuals. When researchers combine subjects with the same medical label but differing clinical pictures into one sample, the generalizability of the findings becomes tenuous.

Even if a large and homogenous sample is identified, it may be difficult for researchers in adapted physical activity to secure cooperation from site administrators and parents. Some administrators, school personnel, or parents may be reluctant to allow persons with disabilities to be involved in experimental studies that require physical activity. Their reluctance may stem from fear that physical activities involve potential medical risk and liability or that confidentiality will be violated. Therefore every effort must be made to assure administrators and parents that safe practices, adequate supervision, confidentiality, and emergency procedures are being followed during the course of the study. The researcher must work closely with the university’s and school district’s human subjects committees to guarantee that the subject’s rights will not be ignored.

The dropout rate of persons with disabilities in training studies is another issue affecting the final sample size, often resulting from transportation problems or secondary medical complications. For example, a study investigating the effects of land and water exercise on elderly women with arthritis experienced a dropout rate of approximately 50% during an 8-week period (Cline, 1989). The two most frequently cited reasons for dropping out of the study were the subjects’ inability to obtain dependable transportation and their recurring arthritic exacerbations. With regard to transportation of subjects to and from the testing site, often the researcher must enlist public transportation, which creates additional costs and time commitments. Because persons with disabilities are also prone to secondary medical complications, APA researchers may confront a higher absenteeism rate
than researchers investigating nondisabled populations. For instance, persons with spinal cord injuries may be faced with recurring urinary tract infections, respiratory ailments, and pressure sores, increasing the probability of dropping out from a lengthy training study.

Developing Standardized Test Instruments

Another challenging issue facing the adapted physical activity researcher is that many of the test instruments and protocols used with the general population are not valid and reliable for use with persons with disabilities. For example, the Cooper 12-Minute Run/Walk Test is a widely used and effective method for measuring the cardiovascular endurance of the general population; however, recent research indicates there are validity, reliability, and administrative difficulties in administering this test to adults with mild to severe mental retardation (Lavay, Reid, & Cressler-Chaviz, 1990). An additional example involves graded exercise test protocols for persons using wheelchairs. Researchers have typically borrowed protocols developed on able-bodied subjects for leg ergometry and used them with persons in wheelchairs for arm ergometry.

This practice may not be valid in light of the protocol dependency found for certain physiological responses such as maximal oxygen uptake during arm cycle and wheelchair ergometry (Lasko-McCarthey & Davis, 1991a, 1991b). Therefore more validity, reliability, and optimization studies of test protocols are needed that would help APA professionals answer future and more important questions (e.g., training studies).

The lack of commercially available testing instruments, developed specifically for persons with disabilities, presents another unique problem to overcome in order to conduct quality research. For example, the exercise physiology literature pertaining to persons with disabilities discusses a variety of home-made ergometric devices such as arm crank ergometers, wheelchair ergometers, and wheelchair treadmills (Glaser, 1985; Golding, Horvat, Beutel-Horvat, & McConnell, 1986; Lasko-McCarthey & Davis, 1991a, 1991b). The lack of commercially manufactured equipment can be attributed to its low market demand. Moreover, differing characteristics of homemade equipment (e.g., friction-braked vs. electronically braked ergometric devices) for measuring the same responses of subjects hinders the generalization of findings across studies.

Training Doctoral Students to Conduct Quality Research

An issue that is critical to the progress of adapted physical activity is the thorough training—of young professionals and students receiving advanced degrees in APA—in research design and methodology pertaining to persons with disabilities. Future researchers must develop the necessary competencies to formulate relevant research questions, conduct the study and, most important, analyze it and write the findings in publishable form. This point is reinforced in a recent study by Dunn and McCubbin (1991) documenting the need for the training of more doctoral students in adapted physical activity to fill the number of available positions in higher education.

Maintaining a Research Focus

It is important for faculty early in their careers to develop a specialization within adapted physical activity, adhering to a specific research focus. Professionals
should not conduct sporadic research such as implementing single studies on
different topics; rather, a series of investigations of substantial questions related
to a specific topic should be addressed over a professional’s career (G. Broadhead,
personal communication, October 23, 1990). A factor that may prevent APA
faculty advisors from engaging in a focused line of research is the diversity of
topics that graduate students request for theses and dissertations. It is difficult for
the graduate advisor to provide expertise on the many disabilities, research
designs, methodological techniques, and subject areas that are encountered in
adapted physical activity.

Recommendations for Conducting Quality Research

To successfully conduct quality research, professionals in adapted physical activ-
ity are faced with a number of challenging issues, several of which have been
outlined above. Although issues are often easy to identify, it is more difficult to
provide concrete recommendations. Professionals in adapted physical activity
will only be able to conduct and complete quality research by adhering to a
carefully planned and systematic inquiry of a research problem. This section
provides the following four recommendations: utilize alternative research designs;
acquire adequate research training; develop a research focus; and promote an
interdisciplinary, collaborative research effort among professionals.

Utilize Alternative Research Designs

Due to the unavailability of large sample sizes, graduate students and researchers
must possess a thorough understanding of alternative research designs found in
applied behavior analysis research such as single-subject designs or case studies
(Hersen & Barlow, 1976; Watkinson & Wasson, 1984). Furthermore, Watkinson
and Wasson (1984) stated that due to the heterogeneity found in certain groups
of persons with disabilities, group research designs are often inappropriate. There
are publishing outlets in psychology, special education, occupational therapy, and
physical therapy for disseminating research using these designs. For example,
these research designs are accepted in such journals as Behavior Modification,
Journal of Applied Behavior Analysis, and Education and Training in Mental
Retardation. Information regarding the similarities and differences between tradi-
tional group research designs and applied behavior analysis research designs are
offered by Cooper, Heron, and Heward (1987), Figoni (1990), and Ottenbacher
(1986).

Acquire Adequate Research Training

As stated previously, Dunn and McCubbin (1991) have documented the need for
more properly trained doctoral students in adapted physical activity to fill the
available positions in higher education. Graduates of doctoral programs in APA
must possess a thorough background in both qualitative and quantitative research
designs, including the use of computer programs in data-based analysis (Dunn &
McCubbin, 1991). Students who have not completed a thesis project during their
master’s degree training may lack the necessary research skills to enter a doctoral
program and be successful in it. If accepted as doctoral students, they should be
required to complete a substantive investigation in the first year of study. Other
disciplines require doctoral students to conduct first- and second-year projects that lead to possible publication and/or serve as pilot work for the dissertation. This practice is especially critical if a student has not completed a master’s thesis.

An example of a doctoral student developing a standardized test instrument to study persons with disabilities follows. During the student’s first year he or she would work closely with his/her major professor to develop test procedures for a specific disability group (e.g., developing a qualitative scoring format of a physical fitness test for children with moderate and mild mental retardation). This first year would also involve conducting a research review and determining the technical adequacy of the test as well as conducting a modest pilot study. During the second year the test procedures would be finalized and an initial validity study would be conducted. In the third year, additional assessment of validity and reliability of the test instrument would occur as the student worked toward completing the dissertation.

Doctoral programs in adapted physical activity should require coursework and writing seminars mentored by the major professor who is an active researcher. This would help doctoral students gain the necessary competencies to formulate relevant research questions, design and conduct research studies and, most important, analyze and write the studies in publishable form. At the very least, before graduating from a doctoral program students should not only have submitted a research paper for publication but also presented the paper at a conference at the state, regional, or national level.

Develop a Research Focus

As stated earlier, it is important for faculty early in their careers to develop a specialization within adapted physical activity, adhering to a specific research agenda. Professionals must remain focused and not sporadically conduct single studies on different topics. One recommendation is to guide the majority of graduate students into the advisor’s area of research interest. (In fact, graduate candidates should be encouraged to apply elsewhere if their research interests do not approximate those of their prospective advisor.) Related questions can be investigated that lay the foundation for future studies. For example, a common research theme is to provide descriptive data on the physiological and psychological characteristics of athletes with disabilities.

One of the researcher’s initial steps may be to develop and optimize the testing instrument and protocol for the population under study as well as check for technical adequacy of the test. Armed with valid and reliable data, the researcher should then continue to explore the implications of his or her findings; for example, a further study might investigate methods to improve those physiological and psychological characteristics (DePauw, 1986).

In addition, administrators in university settings must help tenure-track faculty members establish a research focus early in their careers. Faculty who are already experienced and active in research can assist through positive mentoring of these young professionals during their initial research endeavors. Administrators should also encourage respect among faculty members for other colleagues’ research. For example, in some university settings the professionals who conduct applied research do not receive the same prestige and rewards as professionals who conduct basic research.
Administrators and colleagues must respect as well as assist those professionals who seek answers to questions in adapted physical activity that require applied research efforts. An example of an applied research question is the efficacy of mainstreaming. Although mainstreaming is implemented in many school settings, there is little empirical evidence of its effectiveness as a programmatic strategy to enhance the educational needs of persons with disabilities (Lavay, 1987; Vogler, van der Mars, Darst, & Cusimano, 1990).

Promote Interdisciplinary, Collaborative Effort

During the past 10 years research in adapted physical activity has become more specialized and interdisciplinary. This phenomenon has afforded faculty from all subdisciplines of physical education new opportunities for collaboration and avenues of research. Collaboration among specialty areas (e.g., adapted physical activity and biomechanics) will shed light on research questions that the APA professional in the past could not answer alone. For example, specialists in exercise physiology are beginning to work with professionals in adapted physical activity in order to examine the physiological responses and training needs of such diverse special populations as persons with mental retardation (Fernhall & Tymeson, 1988) and spinal cord injuries (Lasko-McCarthey & Davis, 1991a, 1991b). Collaborative research efforts between professionals in adapted physical activity and biomechanics are beginning to help athletes with disabilities determine the most efficient wheelchair racing techniques (Davis, Gehlsen, & Wilkerson, 1990).

Such efforts among professionals will not only help to solve unanswered research questions and enhance testing, teaching, and training techniques but also have the potential to increase grant funding opportunities for conducting research. Through collaborative efforts with colleagues, professionals at the postsecondary level will be better able to secure research grants in pedagogy, biomechanics, exercise physiology, sport psychology, and sports medicine, for example, as well as grants in personnel preparation and program development.

With this in mind, it is paramount that graduate students in adapted physical activity not only be well prepared in research methods and design but that they also possess a strong secondary area of specialization such as statistics, biomechanics, pedagogy, or exercise physiology. For example, an APA researcher studying physiological responses of persons with spinal cord injuries should not only collaborate with an exercise physiologist but should also possess rudimentary knowledge of exercise physiology and the pathophysiology associated with spinal cord injuries. In this way the APA researcher will be able to effectively communicate with the physiologist as well as help to analyze the mechanisms responsible for the results of the study and be able to convey this information effectively in the discussion section of the manuscript.

Summary

If the scientific body of knowledge in adapted physical activity is to grow and be viewed as a viable sector within the field of physical education, the professionals who make up this area must assume the responsibility of continued quality research inquiry and productivity. Without active scholarly research, professionals
in adapted physical activity will not be adequately equipped to answer the challenges that the future will bring to the APA profession.

References


