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The purpose of this study was to explore historical research trends in adapted physical activity by analyzing abstracts published under special populations by AAHPERD conventions from 1968 to 2004. There were 562 abstracts retrieved that were coded into seven categories: (a) number of authors, (b) data source, (c) sample size, (d) disability type, (e) data analysis, (f) type of study, and (g) focus of study. The coded data are presented as descriptive statistics and linear regression equations. The results of descriptive statistics describe an overall picture of the knowledge accumulation in adapted physical activity. The results of linear regression equations reveal a number of trends over the 37-year period. These trends suggest that adapted physical activity is a growing profession distinguished by several important research directions.

A scholarly recognized profession generally possesses a substantial history (Nixon, 1967). A dimension of such a history is the growth and expansion of the body of knowledge germane to that profession. Thus, the development of adapted physical activity, a relatively young field or area in kinesiology, could be examined as a scholarly profession from its knowledge base history (Reid & Stanish, 2003). Several researchers in adapted physical activity have examined this development through documentary analyses of published materials.

Antony (1986) analyzed research abstracts published under special populations at AAHPERD conventions from 1980 to 1985. Reid and Broadhead (1995) and Porretta and Sherrill (2005) analyzed all articles published in *APAQ* during the first and second decades of the journal, respectively. Reid and Prupas (1998) presented a snapshot of articles on disability sports from SPORTDiscus and other search engines. Sherrill and O'Connor (1999) explored *APAQ* articles from 1997

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to 1998, while Poretta, Kozub, and Lisbo (2000) analyzed the survey research in APAQ from 1984 to 1998. Recently, Reid and Stanish (2003) analyzed all *APAQ* articles between 1984 and 2000 and all *Clinical Kinesiology* issues between 1991 and 2000.

Although insights into the growth of the body of knowledge in adapted physical activity are possible from those documentary studies, no analysis based on AAHPERD abstracts from 1968 to 2004 has been completed. As noted, most documentary analyses used *APAQ* articles as the data source, yet the journal has only existed since 1984. Although Antony (1986) analyzed AAHPERD abstracts, only a 5-year period was included, which is insufficient to yield historical trends. Therefore, a more complete analysis of research trends and the growth of the body of knowledge in adapted physical activity might be possible through a documentary analysis of abstracts published by AAHPERD. In fact, the abstracts from 1968 to 2004 represent the only single data source that exists in adapted physical activity over such a lengthy period of time. Since the history of adapted physical activity as a profession has been recognized for 30 years (Auxter, Pyfer, & Huettig, 2001), the AAHPERD abstracts represent an untapped source of information that covers more than the 30 years. Finally, all previous analyses used only descriptive statistics to depict the growth of knowledge in adapted physical activity.

The descriptive statistics consisted of both frequencies and percentages. A frequency signifies the number of abstracts or articles based on a defined category across years, while a percentage shows the proportion of abstracts or articles found in that category. Yearly frequencies over the years are limited to describing absolute developmental trends of adapted physical activity because they primarily reflect the absolute number of abstracts. For example, let us suppose that yearly frequencies indicate that more papers on visual impairment were produced in 2004 than in 1968. Logically, adapted physical activity has grown in many ways since 1968 and the increase in visual impairment abstracts might simply underscore that more papers overall are being presented under the special population section of AAHPERD. What is necessary is a measure of whether more visual impairment papers are being presented over the years, relative to vast array of other papers. The regression analyses based on yearly percentages over the years in the current study address this concern.

Moreover, additional information about the growth of the body of knowledge in adapted physical activity can be obtained from AAHPERD research abstracts compared to the data sources used in previous studies. Some of the research abstracts published by AAHPERD might not be published in other journals as complete articles for many reasons (e.g., not accepted because of small sample size or not expanded into article form due to career change of author). Therefore, analyzing all AAHPERD research abstracts may reflect a more inclusive source of data.

The purpose of this study was to explore the research history of adapted physical activity by analyzing the abstracts of completed research published under special populations by AAHPERD conventions from 1968 to 2004. In this documentary analysis, an overall picture of the knowledge accumulation in adapted physical activity across years was depicted on the basis of descriptive statistics. However, the primary emphasis of this documentary analysis was to search for developmental trends of the knowledge base in adapted physical activity based on fitted linear regression equations using yearly percentages over the years.

Method

Data Source

All Abstracts of Completed Research published in free communications and posters at AAHPERD conventions from 1968 to 2004 were the data source. These years represent the first and last years of this publication. Symposium abstracts were not used because many of these abstracts did not include specific research studies; rather, symposia were composed of position papers or summaries of research completed.

Categories of Analysis

Categories of analysis refer to descriptive phrases developed for analyzing contents of documents (Duncan, 1989; Johnson & Kittleson, 2000). Based on the format of abstracts and the text *Research Methods in Physical Activity* (Thomas & Nelson, 2000), a total of seven phrases were identified as the categories of analyses for the current study: (a) number of authors, (b) data source, (c) sample size, (d) type of disability, (e) data analysis, (f) type of study, and (g) focus of study. Subcategories were then identified for each of the seven categories.

Subcategories

Subcategories are components of a category developed for coding the abstracts (Duncan, 1989). The number of subcategories reflects the breadth of a category so that no relevant information is missed, that is, not coded. Also, subcategories were designed to be mutually exclusive. Based on these basic rules, plus related knowledge in the literature (e.g., Reid & Broadhead, 1995; Thomas & Nelson, 2000), the coding subcategories are presented as follows.

The first category of analysis, the number of authors, included two coding subcategories: (a) single author and (b) multiple authors. The first subcategory was used for those abstracts completed by a single author, while the second subcategory coded those completed by two or more authors.

Data source, the second category, included three subcategories: (a) participants with disabilities, (b) participants without disabilities, and (c) documents. The first subcategory was used for abstracts with participants who had a disability, the second for research that dealt only with participants without disabilities. The third subcategory was used when the abstract indicated that data originated from documents (e.g., documentary analysis of research presentations in adapted physical education).

The third category, sample size, included three subcategories: (a) small sample, (b) large sample, and (c) other. A small sample code was used for a sample of 1 to 40 participants or documents. A large sample had more than 40 participants or documents. The "other" subcategory coded abstracts without sample designs (e.g., non data-based studies). Sample designs of research (e.g., random or purposive) were not included in this category because most abstracts did not specify their sample designs.

The fourth category, the type of disability, had five subcategories: (a) learning and behavioral disorders, (b) physical and health impairments, (c) sensory

impairments, (d) general disabilities, and (e) other. The first subcategory was used when an abstract focused on intellectual disabilities, mental retardation, learning disabilities, behavioral disorders, autism, and emotional disturbance. The second subcategory included health and orthopedic impairments and physical disabilities. The third subcategory, sensory impairments, included hearing and visual impairments. The fourth subcategory was used as a generic term for disability when the authors referred generally to "children with disabilities," while the fifth subcategory coded a specific disability not defined in the first four coding subcategories (e.g., speech impairment).

Data analysis, the fifth category, included four subcategories: (a) descriptive, (b) parametric, (c) non-parametric, and (d) non-statistical. The descriptive code was employed when abstracts contained such descriptive statistical data as f, $\%$, M, SD, and r. The second subcategory coded abstracts primarily using such parametric statistical methods as t tests, ANOVA, ANCOVA, MANOVA, and factor analysis. The third subcategory designated non-parametric statistical methods as Spearman correlation, Kruskal-Wallis ANOVA, Mann-Whitney U test, Wilcoxon rank test, and Chi-square. When no statistical method was used, it was termed non-statistical.

The sixth category, the type of study, had five subcategories: (a) group, (b) time series, (c) ex post facto, (d) descriptive, and (e) other. The first subcategory was used for abstracts reporting group experimental designs such as two-group pre-test and post-test designs. The second subcategory coded time series designs such as a multiple baseline. The third subcategory was used for comparisons between independent variables that researchers could not actually manipulate such as between children with and without a disability. The fourth subcategory included descriptive investigations such as observational studies, case studies, correlational research, interviews, test score analysis, and documentary analysis. The fifth subcategory coded abstracts with designs other than those included in the first four subcategories.

The seventh category of analysis, the focus of study, included nine coding subcategories: (a) program effect, (b) strategy, (c) integration, (d) psychomotor, (e) psychosocial, (f) research, (g) personnel, (h) recreation, and (i) other. Program effect was used for abstracts on the effect of a physical education program, such as sensorimotor, perceptual-motor, ecological, aquatic, exercise, and motor programs. Strategy, the second subcategory, included teaching and learning abstracts such as prompting procedures, time delay strategies, grouping formats, error estimations, and imaginary learning. Integration dealt with inclusion of individuals with disabilities in regular physical education settings.

The fourth subcategory of psychomotor issues was for abstracts which focused on fitness, movement, and physiological and biomechanical aspects of persons with disabilities. The fifth subcategory of psychosocial issues designated abstracts dealing with self-concept, motivation, attitude, social interaction, and other psychosocial aspects. The sixth subcategory of research was designed for measurement, evaluation, assessment, statistical method, and testing instruments. The seventh subcategory, personnel, included issues such as the need for training adapted physical education personnel. The eighth subcategory of recreation included abstracts on sports and leisure activity for persons with disabilities. The ninth subcategory, "other," was used to code abstracts on any issue not defined in the first eight subcategories.

The authors used the above subcategories as criteria to code each abstract retrieved. An individual abstract was assigned only one subcategory of a designated category because all coding subcategories were mutually excluded. Each abstract was coded seven times, once for each category. For example, an abstract dealing with the effects of a constant time delay procedure on teaching three adolescents with mental retardation gross motor skills using a multiple baseline design (Zhang & Horvat, 1996) was coded in the subcategories of multiple authors, participants with disability, small sample size, learning and behavioral disorders, nonstatistical, time series design, and teaching strategy.

Data Analyses

All abstracts published by the AAHPERD conventions were coded using a *Coding Sheet for Abstracts of Completed Research*. This sheet was designed for the sub-categories of the seven categories. The first author coded all abstracts located while a coauthor coded 20% of the abstracts retrieved. The coded data by the two authors were analyzed to determine an estimate of interrater agreement. This reliability coefficient was calculated with the agreement method (i.e., the number of agreements was divided by the number of agreements plus disagreements and then multiplied by 100).

The second form of data analysis was descriptive statistics, including frequencies and percentages. A frequency was the summed number of abstracts retrieved and coded across the years 1968-2004. A percentage was computed by the summed number of abstracts coded as in a given subcategory across the years 1968-2004 being divided by the total abstracts coded and then multiplying by 100, thus indicating the proportion of a subcategory in its category across years.

The third analysis sought trends based on yearly frequencies and yearly percentages. A yearly frequency was defined as the summed number of abstracts found in a given year for a category. A single trend analysis based on these yearly frequencies was used to describe the absolute change of professionals being involved in special population research projects from 1968-2004. A yearly percentage was obtained by the summed number of abstracts coded in a given subcategory in a given year being divided by the total number of abstracts and then multiplied by 100. These trend analyses based on the yearly percentages were used to describe the relative change of a given subcategory to its corresponding category over years.

The linear regression equation, $Y = a + bX$, in which Y is the frequency or the percentage predicted in a year and X is a year between 1968 and 2004, was used to analyze the trend of professionals involved in research under special populations and the trend of a given subcategory relative to its corresponding category. SPSS software (SPSS, 1993) was used to fit a linear regression equation for each trend. It should be noted that percentages are the type of data with equal intervals that permit one to use them to perform arithmetic calculations. This means that one can use percentages to fit linear regression equations. The percentages were changed into decimals (e.g., 23% into 0.23) in fitting regression equations in this study.

The rationale why linear regression equations were selected to analyze trends was that we could employ the fitted linear regression equations based on the corresponding data sets to describe the trends and also employ the b values to determine if a linear trend has increased, decreased, or remained unchanged and

to see if a linear trend had increased more rapidly than another trend. The b value included in the linear regression equation, $Y = a + bX$, refers to a slope change of the linear line of a fitted trend or an averaged change of the value per year over time. The b value of 1.03 included in the fitted equation of $Y = -2024.45 + 1.03X$, for example, indicates that this line averagely increases of 1.03 per year (Zhang, Joseph, & Horvat, 1999).

At a statistical level of significance, $p \leq .05$, the positive b values indicate increasing trends, while the negative b values illustrate decreasing trends. If the b values were too small to reveal the same level of statistical significance, they were designated to have no trend. The b values could also be used to compare those increasing trends. For example, if the two fitted equations are $Y = 0.86 + 0.41X$ and $Y = 1.32 + 0.29 X$, then the first line shows a faster rate of increase than the second line since its b value (0.41) is larger than the other (0.29). These rules were employed to analyze trends in this study. The authors fitted the b values based on the data collected each year, rather than the data averaged across several years (e.g., 5 years) since using the averaged data across years might mask the possible influence of using yearly data to fit the linear equations.

Results

The mean interrater reliability coefficient was 90%, derived from 96% on the number of abstracts across 1968-2004 and the following seven coefficients from the designated subcategories, 100% number of authors, 90% data source, 94% sample size, 88% type of disability, 87% data analysis, 82% type of study, and 81% focus of study. These coefficients indicate that the number of abstracts identified and coded show adequate estimates of reliability.

A total of 562 abstracts were retrieved. Based on the yearly frequencies of abstracts found, the fitted linear regression equation was $Y = 3.9775 + 0.5901X$, $F(1, 35) = 77.54$, $p = .00$. The trend based on this fitted linear equation increases as presented in Figure 1A. Both the calculated descriptive statistics and the fitted regression equations based on the subcategories of seven categories of analysis are presented in Table 1. The calculated descriptive statistics show the frequencies (f) and the percentages (%) of all given subcategories across the years 1968-2004, while the fitted regression equations present the linear equations and trends based on the yearly percentages of all the given subcategories.

The fitted equations show relative changes of the contribution of given subcategories to their corresponding categories over years in three types of trends: increasing trend, decreasing trend, and no trend. It should be noted that fitted equations based on all the coding subcategories in the same category of analysis may all show increasing trends. These increasing trends can be then compared based on the b values in their fitted linear regression equations. For example, both fitted trends based on the subcategories of participants without disabilities and documents increase; but the trend of participants without disabilities increases faster, based on its b value (0.0066 for participants with disabilities, while 0.0013 for documents).

With the exception of Figure 1A, the remainder of Figures (1B to 1H) highlight fitted trends based on the yearly percentages of coded subcategories at a level of

statistical significance of $p \leq .05$. These figures are provided to assist readers to visually inspect relationships between or among two or more trends in each category of analysis. Figure1B, for example, describes a developmental relationship between the fitted trends based the subcategories of single author and multiple authors. It should be noted that although there is no statistically significant trend for larger sample size, its regression line is still graphed in Figure 1D to demonstrate its relationship with the trend of small sample size.

Discussion

There were a total of 562 research abstracts presented at the AAHPERD conventions. This finding indicates that overall, researchers contribute approximately 15 completed research projects per year to the knowledge base. The yearly number of AAHPERD research abstracts has increased from 1968 to 2004 as demonstrated by the fitted regression trend (see Figure 1A). This finding clearly supports that adapted physical activity is a growing profession overall (Reid, & Stanish, 2003; Sherill, 2004; Zhang, Joseph, & Horvat, 1999). The growth of this profession, however, is impacted by different subcategories in different ways.

In the first category of analysis, number of authors, multiple authors presented about 70% of the abstracts, while single authors presented about 30% across the years 1968-2004 (see Table 1). The regression equations based on single and multiple authors revealed decreasing and increasing trends respectively (see Table 1 and Figure 1B). These data are different from Reid and Broadhead (1995) who reported that single authors were responsible for 51% of *APAQ* articles across the years 1984-1993. However, the data are consistent with Sherrill and O'Connor (1999) for 1997 and 1998 *APAQ* articles and Porretta and Sherrill (2005) for *APAQ* articles published between 1994 and 2003 in which there were a majority of articles with multiple authors.

The data from Reid and Broadhead (1995) represent somewhat early years (1984-1993) when there may have been a tendency toward single authored papers, while data from Porretta and Sherrill (2005) represent somewhat later years (1994-2003) when there may have been a tendency toward multiple authored papers. These indicate that the direction of recent research activity in adapted physical activity has moved toward active collaboration among different professionals in response to the growth of a crossdisciplinary body of knowledge. Reid and Stanish (2003) concluded that adapted physical activity was a profession with a crossdisciplinary knowledge base, in part because they found that its research methods, scientific areas, theories and models, and terminologies were largely shared with and borrowed from its allied fields (e.g., special education and sport medicine).

In the second category of analysis, data source, 81% of the abstracts include data from participants with disabilities, 16% from participants without disabilities and 3% include documents (see Table 1). Of course, this reflects the preference of researchers in adapted physical activity to investigate individuals with disabilities (e.g., Auxter et al., 2001; Dunn, 1997; Sherrill, 2004). Despite this, the number of abstracts including individuals with disabilities demonstrated a decreasing trend while an increasing trend was evident for individuals without disabilities and documents (see Table 1 and Figure 1C). It would appear that the latter two subcategories
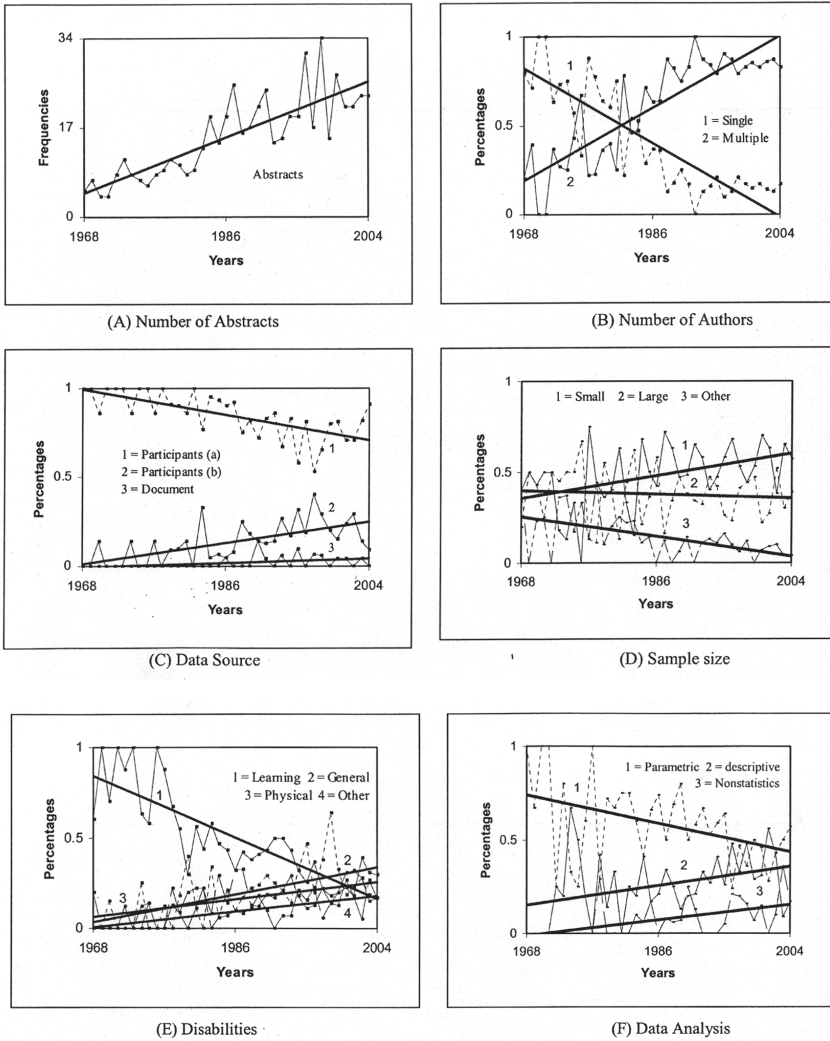
Figure 1 (A-F)—Plotted linear trends of the fitted linear regression equations based on yearly frequencies of the completed research abstracts retrieved under special populations published by AAHPERD conventions between 1968 and 2004 and yearly percentages of the coding subcategories in the seven categories of analysis.
Note. Trends of the fitted linear regression equations with p > .05 are not plotted except the one fitted based on large sample size.

(G) Type of Study   (H) Focus of Study
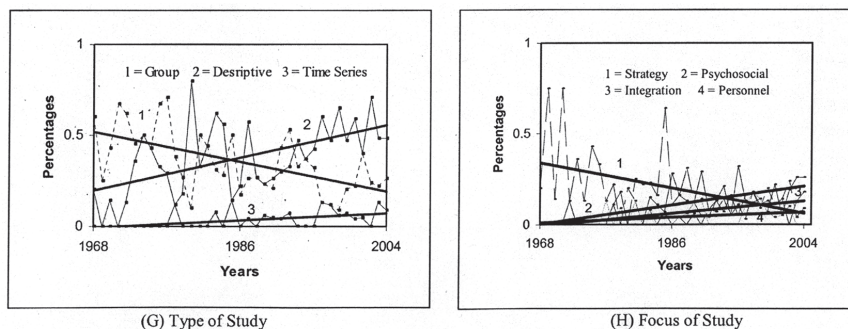
Figure 1 (G-H)—Plotted linear trends of the fitted linear regression equations based on yearly frequencies of the completed research abstracts retrieved under special populations published by AAHPERD conventions between 1968 and 2004 and yearly percentages of the coding subcategories in the seven categories of analysis.

Note. Trends of the fitted linear regression equations with p > .05 are not plotted except the one fitted based on large sample size.

contribute more to the overall growth of adapted physical activity compared to studies only with participants with a disability.

However, it should be noted that participants without disabilities made a greater contribution than documents based on b values in their regression equations. This finding indicates that over the years 1968-2004, adapted physical activity researchers have gradually investigated more phenomena that require responses from individuals without any disabilities (e.g., attitudes of regular physical education teachers or students toward individuals with disabilities). This may be partially a product of the increase in inclusion research. Because researchers should conduct inclusion studies in an ecological system, the increase of inclusion studies may have resulted in an increase of studies using individuals without disabilities as a part of this ecological system.

In the third category of analysis, sample size, most abstracts included a small sample size (51%), while fewer reported a large sample (37%), as shown in Table 1. The trend estimated by the regression equation for small sample increased, while no trend emerged for larger samples (see Figure 1D). Thus small sample size research contributed more to the growth of adapted physical activity articles than other two subcategories.

A number of reasons may explain the increased trend toward research with small sample sizes. There is difficulty with recruiting individuals with specific types of disability, a unique feature of research activities under special populations (Lavay & Lasko-McCarthey, 1992; Tawney & Gast, 1984). The number of individuals with some types of disabling conditions usually is small. For example, the number of individuals with pervasive developmental disorders is about 15 in 10,000 births (Sherrill, 2004), which may result in a researcher being unable to recruit enough individuals as participants from the local area.

Table 1 Descriptive Statistics and Regression Equations Based on Yearly Percentages of the 31 Coding Subcategories in the Seven Categories of Analysis for Completed Research Abstract on Special Populations Published by AAHPERD Conventions Between 1968 and 2004

Category	Descriptive Statistics		Regression Equations		
Subcategory	*f*	*%*	*Y* = a + b*X*	*F* (1, 35)	**Trend**
Number of authors					
Single	169	30.07	$Y = 0.8474 - 0.0232X$	101.01*	decrease
Multiple	393	69.93	$Y = 0.1697 + 0.0225X$	97.87*	increase
*Data source ***					
Participant(a)	458	81.49	$Y = 1.0036 - 0.0080X$	31.56*	decrease
Participant(b)	90	16.02	$Y = 0.0080 + 0.0066X$	25.34*	increase
Document	14	2.49	$Y = -0.0071 + 0.0013X$	7.45*	increase
Sample size					
Small	291	51.78	$Y = 0.3497 + 0.0068X$	7.81*	increase
Large	206	36.65	$Y = 0.3992 - 0.0012X$	0.28	no trend
Other	65	11.57	$Y = 0.2603 - 0.0060X$	15.10*	decrease
Disabilities					
Learning	229	40.74	$Y = 0.8592 - 0.0188X$	72.42*	decrease
Physical	104	18.50	$Y = 0.0583 + 0.0054X$	16.89*	increase
Sensory	37	6.58	$Y = 0.0541 + 0.0004X$	0.17	no trend
General	124	22.07	$Y = 0.0238 + 0.0085X$	20.67*	increase
Other	68	12.11	$Y = 0.0031 + 0.0049X$	24.68*	increase
Data analysis					
Descriptive	146	25.98	$Y = 0.1475 + 0.0057X$	5.40*	increase
Parametric	254	45.20	$Y = 0.7484 - 0.0084X$	7.53*	decrease
Nonparametric	32	5.69	$Y = 0.1200 - 0.0020X$	1.37	no trend
Nonstatistics	130	23.13	$Y = -0.0159 + 0.0046X$	13.09*	increase
Type of study					
Group	164	29.18	$Y = 0.5285 - 0.0092X$	18.54*	decrease
Time series	38	6.76	$Y = -0.0061 + 0.0032X$	11.63*	increase
Ex post facto	107	19.04	$Y = 0.2977 - 0.0025X$	2.74	no trend
Descriptive	235	41.81	$Y = 0.1885 + 0.0098X$	15.05*	increase
Other	18	3.21	$Y = -0.0092 + 0.0017X$	1.94	no trend
Focus of study					
Program	119	21.17	$Y = 0.2705 - 0.0025X$	1.41	no trend
Strategy	90	16.01	$Y = 0.3463 - 0.0077X$	9.25*	decrease
Integration	40	7.12	$Y = -0.0115 + 0.0038X$	19.26*	increase
Psychomotor	114	20.28	$Y = 0.2227 - 0.0014X$	0.48	no trend
Psychosocial	77	13.70	$Y = -0.0027 + 0.0058X$	23.86*	increase
Research	67	11.92	$Y = 0.0903 + 0.0014X$	0.97	no trend
Personnel	27	4.80	$Y = 0.0088 + 0.0026X$	3.96*	increase
Recreation	22	3.92	$Y = 0.0391 + 0.0001X$	0.01	no trend
Other	6	1.08	$Y = 0.0405 - 0.0012X$	3.12	no trend

Note. * = $p \leq .05$; ** includes Participant (a) = Participants with disabilities and Participant (b) = Participants without disabilities.

More contributions from small sample size research may also have resulted from the increase of using time series designs (single subject designs) in adapted physical activity (see Table 1). Time series designs usually have smaller sample sizes than do studies using group designs because the former focus on searching for individual differences (Horner et al., 2005; Tawney & Gast, 1984). Given the individualized nature of adapted physical activity programming, it seems that researchers in adapted physical activity have gradually moved away from group designs from 1968 to 2004. In addition, Bouffard (1993) has cogently argued that adapted physical activity research should search for person-by-treatment interactions via time series designs so that we can understand how individuals react to our programs before attempting to describe how groups react.

In the fourth category of analysis, disability, most abstracts focused on individuals with learning and behavioral disorders (41%), while fewer dealt with other disabilities (e.g., 22% on general disability, 19% on physical disability, and 7% on sensory disorders). These findings are contrary to the previous documentary analyses by Reid and Broadhead (1995) and by Porretta and Sherrill (2005) in which they found that general disability (i.e., generic) was studied most often. However, there is a decreasing trend for learning and behavioral disorders over the years, while physical disabilities, general, and "other" demonstrate increasing trends (see Figure 1E). These findings indicate that the overall contribution of learning and behavioral disorder studies have been made less to the growth of adapted physical activity research than other disability categories. The 1960s was believed to be the critical time of advocating physical education for persons with mental retardation (Sherrill, 2004), which might have resulted in adapted researchers placing particular emphasis on mental retardation (a major part of learning and behavioral disorder defined in this study) before they focused attention to other disabilities.

It seems that adapted physical activity researchers have paid relatively more attention to general, physical, sensory, and other disabilities over the years 1968-2004 (see Table 1 and Figure 1E). However, the subcategory of general disability has shown the greatest increase among other disability types, based on the b values in the fitted equations. This finding reveals that the abstracts using the term of a general disability (e.g., training physical educators for children with disabilities) have contributed more to the growth of adapted physical activity than the abstracts using the term of a specific disability (e.g., fitness measures on children with mental retardation).

Why has research in adapted physical activity moved to more general disability over years (see Figure 1E)? It is likely related to those increasing trends found in the category of focus of study. As discussed later, research in adapted physical activity has moved to focusing on more psychosocial, integration, and personnel issues (see Figure 1H). Since these topics would likely focus on general disability (e.g., attitude toward teaching children with disabilities, methods for including students with disabilities in regular classes, and needs for training physical educators for individual with disabilities), it is not surprised that more abstracts have dealt with general disability since 1968.

In the fifth category of analysis, data analysis, more published abstracts included parametric statistical methods (45%) than other forms of data analysis (each less than 26%). However, the yearly contribution of parametric methods to

the growth of adapted physical activity did not increase, as evidenced by its linear regression equation (see Table1). Thus, although more abstracts reported parametric statistical methods across the years, researchers using these methods contribute relatively less to the growth of adapted physical activity research.

The major contribution to the growth of adapted physical activity in the category of data analysis came from other methods of analysis. As revealed in the regression equations (see Table 1), the trend based on descriptive statistical methods and non-statistical methods increased by an average rate of 0.57% and 0.46%, respectively. These two trends indicate that adapted research using descriptive statistical and non-statistical methods have contributed more to the growth of adapted physical activity from 1968-2004 than other forms of data analysis. Why has research in adapted physical activity moved to more descriptive and non-statistical approaches, and fewer parametric and nonparametric statistical methods over years (see Figure 1F)? It is likely related to the increasing trends of small sample sizes and time series designs because research projects using the small sample sizes and the time series designs would most likely employ descriptive and non-statistical approaches, such as visual inspection of the graphic frequency or percentage data (Tawney & Gast, 1984).

The type of study was the sixth category of analysis. Descriptive (42%), group experimental (29%), and ex post facto (19%) designs were reported more frequently than time series designs (7%) and other types of designs (3%). Among these types of studies, however, descriptive and time series designs increased from 1968-2004, while trends based on other designs decreased or did not change (see Table 1 and Figure 1G). The findings indicate that although the number of abstracts using descriptive and time series designs summed across years is less, the trend based on these subcategories increased more over the years than other types of studies.

It appears that relatively more contemporary research projects in adapted physical activity employ descriptive or time series designs than experimental or ex post facto designs. One of the reasons may be that researchers are becoming more interested in conducting observational-oriented research projects in clinic-based settings. These researchers focus more on behavioral needs and changes by individuals with disabilities, which may result in more research projects employing descriptive designs (e.g., observational studies) and time series designs (e.g., multiple baselines).

Adapted physical activity researchers appear to be conducting fewer group studies with large sample sizes and parametric statistics. As such, they are moving to more time-series studies with small sample sizes and descriptive statistics. It seems that this direction was predicted. Watkinson and Wasson (1984) proposed that time series designs using small sample sizes would be more suitable in adapted research studies, and Bouffard (1993) has argued that group studies with larger sample sizes might be problematic in analyzing individual differences.

In the seventh category of analysis, the focus of study, approximately 41% of abstracts were coded as program effect (21%) and psychomotor issues (20%). In addition, 30% of abstracts dealt with teaching/learning strategies (16%) and psychosocial issues (14%), while 29% of abstracts explored issues of research (12%), integration (7%), personnel (5%), recreational (4%), and other focuses (1%). These findings are somewhat similar those found by Reid and Broadhead (1995) but somewhat different from the findings revealed by Sherrill and O'Connor (1999).

Reid and Broadhead (1995) reported that the top five topics addressed in *APAQ* articles across the years 1984-1993 were physiology (17%), pedagogy (15%), assessment (13%), sport psychology (11%), and motor learning (9%). These five topics, although defined by different coding categories than the present study, were addressed most frequently in our study as well. The topics of pedagogy, motor learning, physiology, assessment, and sport psychology addressed by Reid and Broadhead were included in the subcategories of program effect, teaching/learning strategies, psychomotor issues, psychosocial issues, and research issues, respectively.

In the study conducted by Sherrill and O'Connor (1999), the most common topics were disability sport (35%), developmental and use of instruments (18%), inclusion, integration, and least restrictive environment concerns (16%) among *APAQ* articles published between 1997 and 1998. These issues, as defined in the method section of this paper, were included in research, integration, and recreational issues, respectively, in our study. These issues addressed, however, were less than 10% each in our study. The reasons for the differences between Sherrill and O'Connor and the current findings are likely due to the short span of two years used by Sherrill and O'Connor and that criteria for the acceptance of articles for publications in *APAQ* and for acceptance of abstracts for presentations in AAHPERD are different.

It is interesting to note that the majority of the foci of studies did not increase (see Table 1 and Figure 1H) while the relative number of abstracts dealing with psychosocial, integration, and personnel issues did increase over the years 1968-2004, which support that psychosocial and professional preparation issues are new areas that have emerged over the years 1994-2003 (Porretta & Sherrill, 2005). Based on their b values, the trends of psychosocial and integration issues increased greater than the trend on personnel issues. That is, psychosocial and integration issues contribute more to the development of adapted physical research activity.

The greater contribution by psychosocial studies (i.e., more abstracts focusing on psychological and social aspects in adapted physical education) over the years likely resulted from increased awareness of the psychosocial needs of people with disabilities (Auxter et al., 2001). Initially, researchers were more interested in psychomotor issues (e.g., fitness and motor behaviors by individuals with disabilities) because that was the primary curricular content in adapted physical education. Over the years, the psychosocial needs by people with disabilities have gradually become more obvious due to the integration of people with disabilities into society, which may have motivated researchers to switch to more psychosocial topics (e.g., social competence of individuals with disabilities).

It seems that the greater contribution made by integration research (from 1968-2004) emerged from public policy and legislation related to the least restrictive environments and inclusion (Auxter et al., 2001; Block, 2000). By providing opportunities for individuals with disabilities to develop skills and attitudes required to learn, live, and work in all aspects of society (Stainback & Stainback, 1990), the number of students with disabilities included in regular physical education classes has increased in many schools (Block, 2000; Valentini & Rudisill, 2004). This resulted in more researchers gradually being involved in research projects focusing on inclusion (e.g., effects of the inclusive physical education program on social and motor skill development).

In conclusion, there have been a total of 562 abstracts under special populations published by AAHPERD during the period under review. Results from our descriptive statistics shows an overall picture of the knowledge accumulation in adapted physical activity with several features. These features included more multiple authors; more individuals with disabilities as participants, particularly individuals with learning and behavioral disorders; more research with small sample sizes, parametric statistics, and descriptive, group, ex post facto designs; and more research projects that emphasize program effects and psychomotor issues.

The linear regression equations based on the yearly frequencies of abstracts revealed that adapted physical activity is increasing. Regression equations based on the yearly percentages of the subcategories indicate that contributions to the development of the knowledge base in adapted physical activity has resulted in relatively more research from multiple authors, dealing with participants without disabilities or with physical and general disabilities, using designs with small sample sizes and descriptive statistical and non-statistical methods, employing descriptive and time series designs, and focusing on psychosocial and integration topics.

Based on the relative contributions by the subcategories over years, adapted physical activity research is headed in several directions in the future. Adapted physical activity research is moving toward such directions as collaboration projects, observational studies, single subject research, and psychosocial and inclusion issues with the employment of persons without disabilities or with general disabilities as participants. It is expected that further evidences for documenting these directions can be found in future trend studies using other data sources such as abstracts of completed dissertations in adapted physical activity.

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