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Statistical Data Analysis Techniques Employed in *Sport Marketing Quarterly*: 1992 to 2004

Jerome Quarterman, Brenda G. Pitts, E. Newton Jackson, Jr., Kyoungtae Kim, and Jongback Kim

Abstract

This investigation was an assessment of data analysis statistical techniques used in *Sport Marketing Quarterly* (SMQ) from 1992 to 2004. In 159 quantitative data based articles reviewed, 360 uses of statistical data analysis techniques were identified. The techniques were classified by type of statistical data analysis method as descriptive statistics, parametric statistics, and nonparametric statistics. One half (50.00%) were used as descriptive statistics, 41.94% as parametric statistics, and less than one tenth (8.06%) as nonparametric statistics. Percentages and frequencies were the most frequent descriptive statistics used to answer the research purposes, questions, and/or hypotheses by the researchers of SMQ for this period. One-way ANOVA and regression analysis were the most frequent parametric statistics used and chi-square was the most frequent nonparametric statistic used. The intent of this

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“One way to measure progress and credibility in a relatively new and emerging field is to periodically conduct a comprehensive critical self-examination of the academic literature, such as research topics, methodology, and statistical techniques used in the new and emerging field ...”

investigation was to provide undergraduate and graduate students, their instructors, and other scholars with an overview of the most frequently used statistical data analysis techniques used in SMQ during its first 13 years. In addition, this study has provided some insight into the directions of the research conducted in sport marketing studies from a research methodology standpoint. For a new and developing academic area such as sport marketing, it is important for its consumers to know how such an area advances relative to its research methods.

Introduction

Research in sport marketing has a relatively short history. The launch of the *Sport Marketing Quarterly* (SMQ) as the first research journal for the discipline of sport marketing in 1992 was important in developing sport marketing research. Prior to the founding of SMQ, research related to sport marketing was published in journals specializing in general marketing or featured in sport study related journals. Although sport marketing is now recognized as an emerging field of study, it is still young when compared to its foundational discipline, marketing, or to other related fields such as business.

During the past decade, published research in the field of sport marketing studies has grown significantly. The recent formation of the Sport Marketing Association (SMA) is indicative of the growing recognition of sport marketing as a field of study, as well as a sign for an increased awareness of the need for more rigorous research in the area of sport marketing. The

vision statement of the SMA is to “expand the body of knowledge in the sport marketing field, disseminating the resulting research findings and market-oriented solutions via mass as well as targeted media sources, internal and external to the Association” (SMA, 2003, p. 1). Several scholars in sport management have emphasized that more rigorous research is needed for the development and credibility of a new field (Barber, Parkhouse, & Tedrick, 2001; Olafson, 1990; Parkhouse, Ulrich, & Soucie, 1982; Paton, 1987; Zakrajsek, 1993). Therefore, like any new and emerging academic field, sport marketing must strive for credibility and acceptance by more established disciplines such as marketing and management. Without a rigorous approach to research, sport marketing as a new and emerging field of study may not survive in the higher education enterprise. One way to measure progress and credibility in a relatively new and emerging field is to periodically conduct a comprehensive critical self-examination of the academic literature, such as research topics, methodology, and statistical techniques used in the new and emerging field (Crawford-Welch & McCleary, 1992; Reid & Andereck, 1989; Riddick, DeShriver, & Weissinger, 1984). Indeed, it has been noted that sport management academics should seek methods to enhance the scholarship in sport management (Parks, 1992). Numerous scholars in sport management have stated that the literature should be evaluated to help determine its state and to detect development needs (Barber, Parkhouse, & Tedrick, 2001; Chelladurai, 1992; Olafson, 1990; Parks, 1992; Paton, 1987; Pitts, 2001). Indeed, “a body of knowledge that includes all known facts, theories, and principles about a subject is necessary for the continued and sustained growth of an academic field” (Pitts, 2001, p. 88).

Sport Marketing Quarterly (SMQ)

Currently, *SMQ* is recognized as the central forum of conceptual and empirical research in sport marketing studies. Founded in 1992, *SMQ* was the first and sole sport marketing specific outlet for scholarly articles in the area of sport marketing. It is a refereed journal through which theory development and research are disseminated to individuals interested in sport marketing. As stated inside the front cover of each issue, the purpose of *SMQ* is to “provide a publishing outlet for the dissemination of sport marketing information for both practicing professionals and academicians” (SMQ, 2004, p. 1). These two important constituencies now have an opportunity to develop a relationship that is intended to be mutually beneficial. For practitioners, *SMQ* provides a vehicle to share marketing successes with peers. For academicians, *SMQ* provides a forum for sharing research. A variety of colleges and universi-

ties and individuals in the United States, Canada, and many foreign countries subscribe to *SMQ*.

Conceptual Relevance for Examining the Literature in Sport Management

One of the pioneers of the sport management field of study once stated “Any profession must have a sound body of knowledge to under gird it if it is to survive with its professional status fully recognized by society” (Zeigler, 1987, p. 15). Scholars in sport management are just now beginning to examine its literature critically to determine its state and investigate where improvements can be made. It has been stated that “Academic journals mirror the direction of a discipline’s research” (Van Doren & Heit, 1973, p. 67). Moreover, “improvement of any discipline is partially dependent on an appraisal of the past; therefore, the need to examine the methodological quality of research reported in academic journals” (Barber, Parkhouse, & Tedrick, 2001; Hoyer, Raskind, & Abrahams, 1984; Riddick, Deshriver, & Weissinger, 1984; Stokes & Miller, 1975). Various scholars have examined the state of their journals and other literature in their disciplines via content analysis and a variety of other research methodologies (Bagloglu & Assante, 1999; Barber, Parkhouse, & Tedrick, 2001). Therefore, critical examination of the literature in a field is needed to assist its growth and development.

Until recently, there has been no critical examination of sport management or sport marketing journals. Those recent studies include examinations of the following journals and one study of sport management textbooks. The first known study of a sport management journal was by Barber, Parkhouse, and Tedrick (2001) on the *Journal of Sport Management* and published in July 2001. Soon after, another study by Pedersen & Pitts (2001), a content analysis of the *Sport Marketing Quarterly*, was published in September, 2001. Another study by Pitts and Pedersen (2003) involved an examination of the *Journal of Sport Management* and was presented at a conference in June 2003. A study of the new *Journal of Sports Economics* was conducted and published by Mondello and Pedersen (2003) in February 2003. Further, a study of sport management books has been undertaken and was presented at a conference in September, 2004 by Pitts and Danylchuk (2004). Prior to these studies on sport management journals and books, there was examination of and reviews of sport management dissertation abstracts (Parkhouse, Ulrich, & Soucie, 1982), other published abstracts (Paton, 1987); sport management articles and dissertations (Cornwell & Maignan, 1998; Douvis & Douvis, 2000; Olafson, 1990; Pope, 1998; Shannon, 1999); sport management conference

abstracts (Soucie & Doherty, 1996); and, subjective descriptive reviews of sport management journals and textbooks (Mahony & Pitts, 1998; Slack, 1996).

It is the more recent research that is the beginning of critical examination of the sport management literature. These studies incorporated various research methodologies and were focused on various aspects of the journals. Barber et al, (2001) studied the research methodologies used in the studies published in the *Journal of Sport Management*. Pedersen and Pitts (2001) used content analysis to examine numerous aspects of the *Sport Marketing Quarterly*. Pitts and Pedersen (2003) and Mondello and Pedersen (2003) also used content analysis to examine a variety of aspects of the *Journal of Sport Management* and the *Journal of Sports Economics*, respectively.

“After a comprehensive literature search, the authors discovered that an increasing number of investigations of this type have been conducted in several academic fields and disciplines, and that there are the beginnings of examination of sport management literature.”

All investigators in all of the aforementioned research called for further critical examination of the sport management literature. Indeed, they suggested that every type of literature be examined critically with a variety of methods for a more complete examination of the literature. In addition, there is precedent for conducting this type of research. Most fields of study have done so with the goal of ascertaining the state of their literature and, perhaps more importantly, in determining weaknesses and strengths in the literature. Therefore, there is a need to critically examine all of the literature in sport marketing to help determine its current state and identify strengths and weaknesses so that scholars and academics can begin to strengthen the literature.

Moreover and specifically, the conceptual relevance used to guide this investigation was grounded in the components of quantitative research methodology (Creswell, 2003) and the basic methods and techniques used for understanding research results (DePoy & Gitlin, 1994; Gall, Gall, & Borg, 2003; McMillan & Schumacher, 2001; Neuman, 2003). Usually six to eight typical components make up quantitative research methodology: research design, independent and dependent variables, population and sample size, sampling method and techniques, data collection procedures, psychometric measurements (validity and reliability), instrumentation, and statistical data analysis techniques (Baumgartner, Strong, & Hensley, 2002; Cozby, 1992; Creswell, 2003; DePoy & Gitlin, 1994).

This investigation focused on the latter component, statistical data analysis techniques.

The statistical data analysis for the current investigation was adopted from research methodology and statistics textbooks and classified into three distinct groups: descriptive statistics, parametric statistics, and nonparametric statistics (DePoy & Gitlin, 1994; Gall et al., 2003; Hinkle, Wiersma, & Jurs, 1994; Howell, 1999; Leedy & Ormrod, 2001; McMillan & Schumacher, 2001; Neuman 2003).

Descriptive statistics refer to techniques used to describe and summarize data. Parametric and non-parametric statistics are used for making inference about the characteristics of a population itself or a sample of such population known as inferential statistics. The distinction made between the two subsets is determined by the scales of measurements (e.g., nominal, ordinal, interval, and/or ratio) when measuring the study variables in a research investigation (Gall et al., 2003; Hinkle et al., 1994; Leedy & Ormrod, 2001; McMillan & Schumacher, 2001; Neuman, 2003). Table 1 presents a summary of the three groups of statistical methods, their definitions, and related techniques as operationalized in the current investigation.

“In 159 articles analyzed, there were 360 uses of statistical techniques. Many of the articles used more than one statistical technique; therefore, the number of techniques exceeded the number of articles.”

Literature Review

After a comprehensive literature search, the authors discovered that an increasing number of investigations of this type have been conducted in several academic fields and disciplines, and that there are the beginnings of examination of sport management literature. Educational psychology surfaced as the first discipline of which data were tabulated and classified based on the types of statistical techniques used in its scholarly journals. Previous tabulations of statistical data analysis techniques have been found in such professional journals as the *American Psychologist* (Edgington, 1974); the *American Educational Research Journal (AERJ)* (Wilson, 1980); the *Journal of Educational Psychology* (Goodwin & Goodwin, 1985a); and the *Educational Researcher* (Elmore & Woelke, 1988; Goodwin & Goodwin, 1985b). Two of the latest studies have been conducted within the last 10 years. Baumberger and Bangert (1996) analyzed and coded the type of research design and statistical techniques published in the *Journal of Learning Disabilities (JLD)* from 1989 through 1993. Based on their findings, more than one half (55%) of all the statistical techniques used in the *JLD* were coded

Table 1**A Summary of Statistical Data Analysis Techniques and Procedures**

Technique	Definition	Example
Descriptive statistics	Techniques for describing, organizing, and summarizing numerical data (Gall, Gall, & Borg, 2003; Kirk, 1978; Runyon, Coleman, & Pittenger, 2000)	Mean, mode, median, variance, standard deviation, range, percent age, frequency, and rank
Parametric statistics	Inferential statistical techniques used for making inferences about a population itself or a sample of such population when data have been measured on an interval or ratio scale (Conover, 1999; Gall, Gall, & Borg, 2003; Hinkle, Wiersma, & Jurs, 1994; Howell, 1999; McMillan & Schumacher, 2001; Neuman, 2003)	<i>t</i> test, ANOVA, MANOVA, ANCOVA, MANCOVA, correlation, regression, trend analysis, discriminant analysis, cluster analysis, multidimensional analysis, path analysis, structural equation model, conjoint analysis, and Z score
Nonparametric statistics	Inferential statistical techniques used for making inferences about a population itself or a sample of such population when data have been measured on a nominal or ordinal scale (Conover, 1999; Gall, Gall, & Borg, 2003; Hinkle, Wiersma, & Jurs, 1994; Howell, 1999; McMillan & Schumacher, 2001; Neuman, 2003)	Chi-square, Mann-Whitney, Kruskal Wallis, and Spearman rank correlation

as primary, 32% as intermediate, and the remaining 14% as advanced statistical techniques. ANOVA was the most frequently used technique. Kieffer, Reese, and Thompson (2001) examined 756 articles published in the *AERJ* and in the *Journal of Counseling Psychology (JCP)* over a 10-year period. They found that certain techniques (e.g., ANOVA and ANCOVA) were used proportionately less frequently than previously found in the earlier studies by Goodwin and Goodwin (1985a, 1985b) and Wilson (1980).

Other scholars have also evaluated statistical data analysis methods and techniques in marketing research (Grazer & Stiff, 1987), tourism research (Dann, Nash, & Pearce, 1988; Reid & Andereck, 1989), clothing research (Kang-Park & Sieben, 1993), hospitality management research (Baloglu & Assante, 1999), and recreational management research (Jamieson, Ross, & Swartz, 1994). In the latter study, Jamieson et al. (1994) conducted a content analysis of all articles published in the *National Intramural, Recreational Sport Association (NIRSA)*, the *Journal of Sport Management*, and published proceedings from the NIRSA annual conferences between 1986 and 1993. A major result of this study showed that descriptive statistical techniques (i.e., the

measures of central tendency and variability) were most frequently used by the researchers of NIRSA.

Baloglu and Assante (1999) analyzed 1,073 articles in five hospitality management journals over a seven-year period from 1990 to 1996. The findings revealed that descriptive statistics were used extensively across all publications; however, multivariate or inferential statistics showed an incremental increase over the period studied. Kang-Park and Sieben (1993) also identified the statistical techniques used by the authors in articles on the social psychological aspect of clothing between 1970 and 1985. They grouped the techniques into four levels: basic, intermediate, advanced, and nonparametric procedures. The major findings of their study showed basic techniques were used by nearly one half (48.3%) of the authors, intermediate techniques by nearly one fourth (23.3%), and advanced techniques by less than one tenth (8.9%) of the authors.

When critically looking at the literature of the previous studies, they all used an arbitrary process of classifying the statistical techniques by degree of complexity as basic, intermediate, or advanced. This system was recommended by Goodwin and Goodwin (1985a, 1985b). While this system corresponds to a course of

progression in statistics, the criteria for such classification became problematic when reporting and discussing the results of major findings. Logically, the system may cause one to raise questions such as: Is the degree of complexity based on the case of which a statistic can be computed? or Is the degree of complexity based on the simplicity or complexity of the outdated due to technological advances for computing data at the current time? For example, during the 1980s, factor or discriminant analyses may have been viewed as advanced statistical analyses; however, currently such techniques may be considered as basic techniques. Out of such concerns, the authors of the present investigation decided to use a different approach for classifying the statistical data analysis techniques. The concept that guided the current investigation was adopted from research methodology textbooks; the techniques were classified as descriptive statistics, parametric statistics, and nonparametric statistics (see Table 1; DePoy & Gitlin, 1994; Gall et al., 2003; McMillan & Schumacher, 2001; Neuman, 2003).

In sport management, as previously mentioned, such critical review of the literature is just beginning. Indeed, perhaps critical examination of sport management literature can be a new focus of research in the sport management field. To date, five studies have been conducted on specific sport management journals and books. This important research will help guide future researchers and sport management journal editors and even publishers in determining the direction of and enhancing the state of the sport management literature.

Purpose and Significance of the Study

The purpose of this study was to examine specific aspects of one scholarly journal in sport marketing, the *Sport Marketing Quarterly*. To date, this type of research has not been conducted. Therefore, the results of such examination can significantly inform the state of this journal based on the examined characteristics. This information is important to guide academics, practitioners, and scholars interested in sport management and specifically in addressing the needs of the literature. For instance, the findings of such analysis of the state of the literature might (1) provide foundation data from which future directions of the literature may be considered; (2) provide information for course content in graduate level research methods courses in sport marketing; (3) provide information for a minimum level of knowledge and understanding of statistical data analysis techniques used in sport marketing studies; (4) provide research information for sport marketing faculty development for those who teach students in research methods and statistics courses; (5) provide a basis for comparing sport marketing to other

fields regarding the comparative level of sophistication, development, and maturity of the sport marketing literature; and, (6) provide information regarding the extent to which various statistical methods and techniques have been used.

Research Questions

This investigation examined the frequency and possible changes of statistical data analysis techniques used in quantitative data based studies appearing in *SMQ* from 1992 to 2004. Three research questions were examined with respect to the quantitative studies in *SMQ*:

1. *What were the most frequently used quantitative statistical data analysis techniques that were primary to the research purposes, questions, and/or hypotheses appearing in SMQ from 1992 to 2004?*
2. *What were the most frequently used quantitative statistical analysis techniques that were primary to the research questions or hypotheses appearing in SMQ from 1992 to 2004 when classified as descriptive, parametric inferential, and nonparametric inferential statistics?*
3. *What were the trends in the use of statistical data analysis techniques used in SMQ from 1992 to 2004?*

Method

This research is part of a major ongoing research effort to better understand statistical data analysis methods and techniques that are unique to sport management and sport marketing studies. For this investigation, 251 articles published in *SMQ* during its first 13 years, from 1992 to 2004, were classified as conceptual, quantitative data based, or qualitative data based. *Conceptual articles* were defined as those that described or discussed concepts and did not employ a statistical analysis. *Qualitative data based articles* were defined as articles of which no numerical values were collected and analyzed. *Quantitative data based articles* were defined as articles of which numerical values were collected and analyzed that represented an amount or count. Quantitative data based articles accounted for nearly two thirds (159 or 63.3%) of the articles published in *SMQ*. Qualitative data based articles accounted for less than one tenth (6.4%) of the articles, and conceptual articles accounted for nearly one third (29.5%) of such publications. Only quantitative data based articles (e.g., articles for which numerical values were collected and analyzed that represented an amount or count) were included in the current investigation. A summary of the levels and types of techniques is presented in Table 2. Of the 159 articles investigated, two of the studies used mixed methods,

Table 2***A Descriptive and Numerical Summary of Manuscripts Published in the Sport Marketing Quarterly: 1992 to 2004***

Type of article	Definition	No.	%
Quantitative data based article	A data based article for which numerical values were collected and analyzed that represented an amount or a count	159	63.35
Qualitative data based article	A data based article for which nonnumeric values were collected and analyzed that represented a class or category	16	6.37
Both quantitative and qualitative data based article	A data based article that employed both quantitative and qualitative values	2	0.80
Conceptual article	An article for which data were not collected where the writer presented a discussion or some significant idea, concept, theory, issue, or program related to the field of sport management	74	29.48
Total		251	100.00

including both quantitative and qualitative data analysis techniques. The majority of the articles contained multiple descriptive and inferential statistical data analysis techniques.

Conceptualization and Validation of the Data Analysis Categories

Content validity was used to determine the type of items to adequately measure the construct of data analysis techniques from studies in educational psychology (Edgington, 1974; Wilson, 1980), educational research (Goodwin & Goodwin, 1985a, 1985b), learning disabilities (Baumberger & Bangert, 1996), recreational sport (Jamieson et al., 1994), management (Kieffer et al., 2001), and leisure studies (Riddick et al., 1984). In these studies, the data analysis techniques were listed by categories and divided by levels. Drawing from the works of DePoy and Gitlin (1994), Gall et al., (2003), McMillan and Schumacher (2001), and Neuman (2003), 28 common statistical techniques were identified and classified among the three major categories of statistical techniques: descriptive, parametric, and nonparametric statistics (see examples in Table 1, Column 3).

Content validity was established by the use of a panel of experts to review each of the categories and levels of data analysis techniques. Two graduate faculty members and three doctoral students who were not a part of the research team were asked to examine each of the categories and to judge how well the categories related

to the purpose of the investigation. Both faculty and students were identified as knowledgeable and actively involved in statistical procedures. Feedback from the panel resulted in slight modification of the categories and instrument for content validity and editorial concerns. Comments were solicited by the first author through the use of individual conferences with each member of the review panel.

Data Coding Procedures

Two of the co-authors were graduate students and were trained by the primary author as reviewers for the data analysis techniques employed in the articles. The reviewers were in the doctoral program in sport management at a major research institution. Each reviewer independently read and coded each of the techniques in 159 articles. Coding procedures were based on a systematic categorization scheme employed in earlier studies (Baumberger & Bangert, 1996; Goodwin & Goodwin, 1985a, 1985b).

The coding scheme involved locating every statistical technique used in a study and then classifying the technique as being either primary or secondary. A statistical technique was considered primary when it was used to directly answer a study's research purpose, questions, and/or hypotheses. When a technique was judged as primary, it was marked a *y* (meaning *yes*) on the coding form. A technique was considered secondary when it was reported as a means of supplementing a higher level statistic. When a technique was consid-

ered preliminary to a major analysis (e.g., factor analysis) or a supplement to the major analysis (e.g., means and standard deviation reported in conjunction with ANOVA, etc.), it was not coded. This approach was similar to those used in earlier studies (Baumberger & Bangert, 1996; Goodwin & Goodwin, 1985a, 1985b). The distribution of techniques that were considered primary to the research purpose, questions, and/or hypotheses of each study is outlined in Figures 2 through 4 and Table 3.

Year to year Percentage Use Indices (PUIs) were computed for each of the statistical data analysis techniques. In the current investigation, the PUIs reproduce the percentage of statistical data analysis techniques used in a given year and can range from 0 to 100%. In using this computation procedure the frequent use of a given type of statistical data analysis technique was divided by the number of total techniques that emerged for each year and the quotient was multiplied by 100 (Stone-Romero, Weaver, & Glenar, 1995). For example, shown in Figure 5, the PUIs for inferential statistics and descriptive statistics in 2004 were $(16/23) \times 100 = 70\%$ and $(6/23) \times 100 = 26\%$, respectively.

Reliability of the Coding Process

In order to assure validity of the coding process, two individuals were selected who had a formal educational background in statistics. They were experienced coders who participated in a series of systematic training sessions and content analyses of statistical techniques in sport related journals. Initially, the coders were trained through two practice sessions. The practice was on the articles (e.g., 5-year period and 15-year period) from sport management and sport marketing related journals. In each training session, the coders located every statistical technique related the research purpose, hypothesis, or question and then classified the techniques. When there was a disagreement, the coders discussed disagreement with statistical experts to make sure the statistical technique and its relationship to the research purpose, hypothesis, or question was accurate. The purpose of such practices was to eliminate disagreements between coders for validation of this study. This approach has been one of the most appropriate ways to reconcile coding disagreements (Gerstner & Day, 1997; Scandura & Williams, 2000). In addition, this process was followed throughout the entire research study where coders checked each other for the disagreements.

Rater agreement levels between the coders were 82 to 96 percent. Reliability coefficients of 80 percents have been interpreted as adequate for this type of research (DePoy & Gitlin 1994; Gall, Gall, & Borg 2003; Neuman 2003; Nunnally 1967).

Results

The quantitative statistical data analysis methods and techniques that were primary to the research purposes, questions, and/or hypotheses appearing in *SMQ* from 1992 to 2004 are shown in Figures 1 through 5 and Table 3.

Figure 1

A summary of the statistical data analysis methods used in the *Sport Marketing Quarterly*, 1992 to 2004

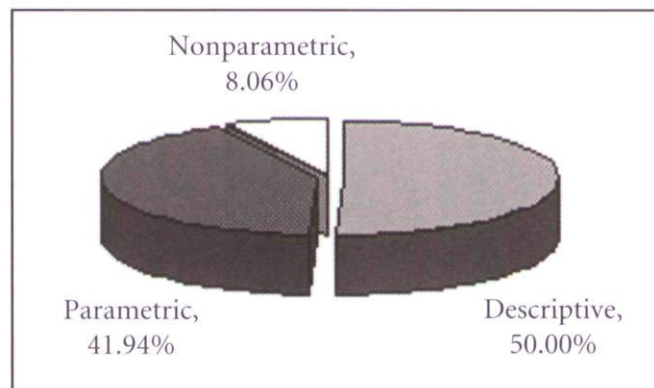


Figure 1 and Table 3 show the total number of uses of the statistical methods and techniques used by *SMQ* researchers during its first 13 years. In 159 articles analyzed, there were 360 uses of statistical techniques. Many of the articles used more than one statistical technique; therefore, the number of techniques exceeded the number of articles.

Descriptive statistical techniques were most frequently used, accounting for one half (50.00%) of all techniques used. Among descriptive statistical techniques, percentage (21.94%), frequency (15.28%), and mean (6.67%) were most commonly used.

Parametric inferential statistical techniques were the second most frequently coded techniques (41.94%). In addition to the 16 techniques used in *JSM*, conjoint analysis and multidimensional scaling were included in the parametric inferential statistical techniques. Of these techniques, one-way ANOVA (7.50%), regression (6.39%), and *t* test (5.28%) were most commonly used.

Nonparametric inferential statistical techniques were least frequently coded (8.06%) as primary to answering the research purposes, questions, and/or hypotheses proposed by *SMQ* researchers. Nonparametric inferential statistics included Mann-Whitney as well as chi-square, Spearman rank correlation, and Kruskal Wallis. Of the four techniques, chi-square (6.39%) was the most frequent technique to be coded; each of the other techniques accounted for less than 1% of total nonparametric inferential statistical techniques.

Figure 2 summarizes the types of descriptive statistics used by the researchers in *SMQ* between 1992 and 2004. Seven types of descriptive statistical techniques

Table 3

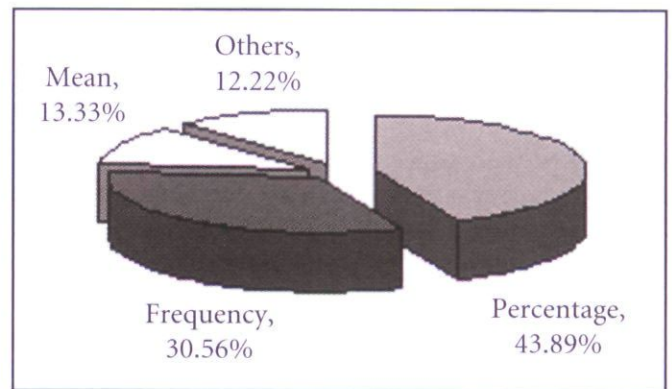
Frequencies and Percentages of major statistical techniques used in the Sport Marketing Quarterly, 1992 to 2004

	1992-2004	
	N	%
Number of Quantitative Articles (n)	159.0	
Number of Statistical Techniques (n)	360	
Average Technique per Article	2.3	
DESCRIPTIVE STATISTICS		
Percentages	79	21.94
Frequency	55	15.28
Mean	24	6.67
Rank	11	3.06
Standard Deviation	8	2.22
Median	2	0.56
Range	1	0.28
Total	180	50.00
INFERENTIAL STATISTICS: PARAMETRIC		
One-way ANOVA	27	7.50
Regression	23	6.39
T-test	19	5.28
Post-hoc Multiple Comparisons	19	5.28
Pearson Product Moment Correlation	14	3.89
Factor Analysis	12	3.33
One-way MANOVA/MANCOVA	10	2.78
Factorial ANOVA	6	1.67
Z-scores	4	1.11
Discriminant Analysis	4	1.11
Factorial MANOVA/MANCOVA	3	0.83
Structural Equation Model	3	0.83
Logistic Regression	2	0.56
Factorial ANCOVA	1	0.28
Cluster Analysis	1	0.28
Path Analysis	1	0.28
Multidimensional Scaling	1	0.28
Conjoint Analysis	1	0.28
Total	151	41.94
INFERENTIAL STATISTICS: NONPARAMETRIC		
Chi Square	23	6.39
Mann-Whitney	2	0.56
Kruskal Wallis	1	0.28
Spearman Rank Correlation	1	0.28
Fisher's Exact Test	1	0.28
Wilcoxon Signed Rank Test	1	0.28
Total	29	8.06

were identified that were directly related to answering the research purposes, questions, and/or hypotheses. Of this amount, three (percentage, frequency, and mean) accounted for nearly all (87.78%) of such techniques. Percentage was the most dominant statistical

Figure 2

A summary of descriptive statistics used in the Sport Marketing Quarterly, 1992 to 2004

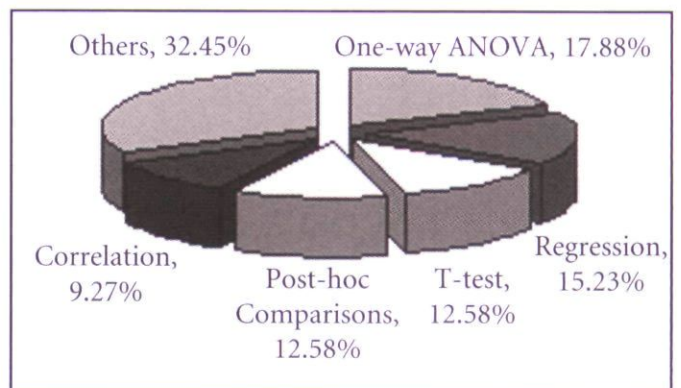


technique to emerge, accounting for 43.89% of the descriptive statistical techniques used in *SMQ*.

Of 18 parametric statistical techniques, five accounted for nearly two thirds (67.55%) of such techniques (see Figure 3). One-way ANOVA was the single most dominant technique, accounting for 17.88% of the techniques. Regression analysis was the second most predominant technique (15.23%). The *t* test, post-hoc multiple comparisons and Pearson product moment correlation accounted for 12.58%, 12.58%, and 9.27% of the techniques, respectively. The remaining 13 statistical techniques accounted for less than 7.00% each. Figure 4 shows that chi-square was the most frequently used nonparametric technique used in *SMQ* by its researchers between 1992 and 2004.

Figure 3

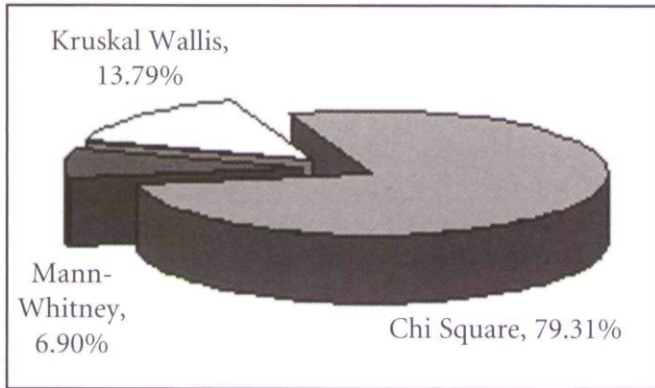
A summary of parametric statistics used in the Sport Marketing Quarterly, 1992 to 2004



The percentage usage (PUIs) values of the techniques are plotted in Figure 5. As illustrated in the figure, the PUI for descriptive statistics have gradually decreased from the initial issues of *SMQ* in 1992 to the issues of 2004. The mean rate of such PUIs were 53.9% and ranged from 86% (1992) to 26% (2004). Unlike descriptive statistics, the PUIs for parametric statistical data analysis techniques have gradually increased from 1992 to 2004 in *SMQ*. The mean rate for such PUIs

was 38.4% and ranged from 14% in 1992 to 70% in 2004. Interestingly, the mean PUIs percentage rate for nonparametric statistics was 7.3% and ranged from 0% to 12%.

Figure 4
A summary of non-parametric statistics used in the Sport Marketing Quarterly, 1992 to 2004



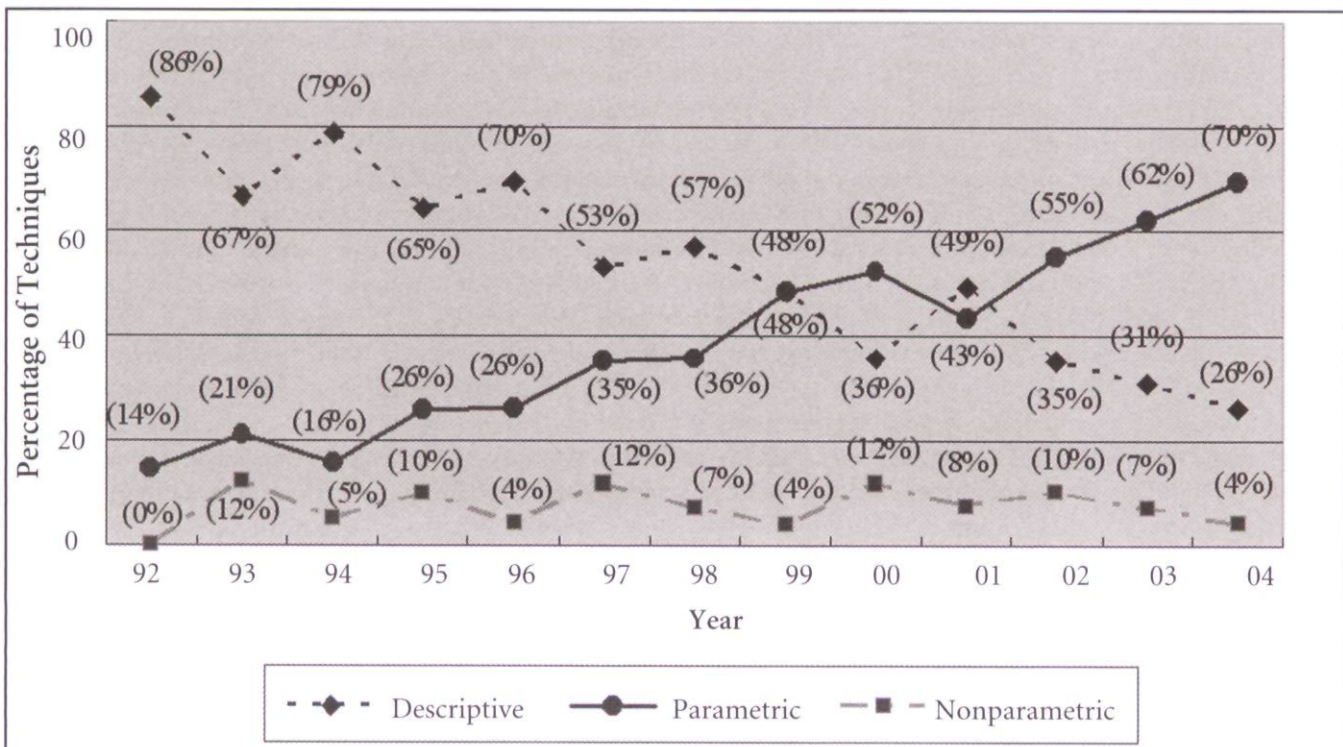
Discussion

The findings of this investigation can be attributed to the nature and scope of descriptive and inferential statistics. Descriptive and inferential strategies are two distinctive and complementary statistical techniques, however, both are necessary for analysis of data in the field of sport marketing. In the current investigation, it is not intended to make a case that descriptive statistics are better than inferential statistics. More importantly

was that the researchers utilized statistical data analysis techniques that were appropriate to a given research purpose(s), question(s), and/or hypothesis(es). Both descriptive and inferential statistics contribute to advancement of the body of knowledge of the field in sport marketing when they are effectively articulated and designed. The purpose of descriptive statistics is to condense, summarize, or describe a given set of data (Gall, Gall, & Borg, 2003; Kirk, 1978; Neuman, 2003; Runyon, Coleman, & Pittenger, 2000). They are used to describe exploratory base findings and may be used to provide fundamental knowledge for further interpretation of inferential statistics. Descriptive statistics are used to describe what currently exists or what people believe by measures of central tendency (i.e., mean, mode, median, etc.), measures of condense data (i.e., frequency counts and percentages) and/or measures of variability (i.e., range, standard deviations, and other statistics).

Unlike descriptive statistics, inferential statistics can be thought of as a group of techniques or procedures that enable a researcher to generalize findings obtained by measuring a variable in a certain number of subjects to the larger group (population) from which the sample was chosen. Inferential statistics are used for making assumptions about a population itself and to find differences, relationships, associations, and/or predictions of variables of interest. Inferential statistics are considered to be more sophisticated for analyzing data

Figure 5
Trends in the Use of Statistical Data Analysis Techniques used in Sport Marketing Quarterly, 1992 to 2004



than descriptive statistics. For example when researchers want to test hypotheses, or decide whether differences in results exist between the mean scores of two or more groups they use inferential statistics. (Conover, 1999; Gall, Gall, & Borg, 2003; Hinkle, Wiersma, & Jurs, 1994; Howell, 1999; McMillan & Schumacher, 2001; Neuman, 2003). Based on such analogy, our findings show that there has been a developing sophistication in terms of statistical data analysis techniques employed in *SMQ* between 1992 and 2004. As illustrated in Figure 5, the plot shows that descriptive statistics have gradually decreased in use by *SMQ* researchers however, inferential parametric statistics have gradually increased from 1992 to 2004. For example, parametric statistics accounted for 70% of the data analysis techniques used in *SMQ* in 2004. Unlike descriptive and parametric statistics, the PUIs for inferential nonparametric statistics did not vary and were generally below 12% for the entire period.

This investigation has been one of the first of critical self-analysis of the research conducted in the field of sport marketing. In order for a field or discipline to grow and improve it must periodically allow for self evaluation (Riddick, DeSchriver, & Weissinger, 1984). One way to measure progress and credibility in a relatively new and emerging field is to periodically conduct a comprehensive critical self-examination of the academic literature, such as research topics, methodology, and statistical techniques used in the new and emerging field (Crawford-Welch & McCleary, 1992; Reid & Andereck, 1989; Riddick, DeShriver, & Weissinger, 1984). Critical self-analysis is a motivating factor and is healthy for the field of sport marketing. This type of analysis informs us of where we have been and where we are currently.

Furthermore, as sport marketing educators we are a part of a relatively small group of scholars within the larger higher education academic enterprise and, as such, must have an investment in the future development of our chosen field, sport marketing studies. In order for research to progress and develop the necessary degree of sophistication, it is important to engage in periodic objective critical self-evaluation as we have attempted to do in the current investigation.

This investigation posits nothing with respect to the quality of the research published in *SMQ*. Instead, it provides us with a summary of the state of the most frequently used statistical techniques in this one journal in the field. The extent of familiarity a reader has with such techniques will determine to what extent the reader can critically profit from the results of empirical investigations in *SMQ*.

The authors hope that the findings of this study will be examined alongside other studies on the sport man-

agement literature. Together, the studies can bring light to the state of various aspects of the literature. When all of the literature has been examined, this will serve as a basis for developing and enhancing all aspects of the literature.

Implications of the Study

The findings of this study reveal the state of some aspects of the literature published in the journal *Sport Marketing Quarterly*. From this information, academicians may ascertain strengths and weaknesses found in these particular aspects of this journal and begin to address them. (As the authors of this study, we do not want to dictate such action or direction—we believe that should be left to sport marketing scholars and researchers.)

Also, the findings of the current investigation should be of special interest to students and faculty of graduate level programs in research methods and statistics courses in sport marketing studies. Specifically, in reference to the current investigation, the findings should eliminate some of the fear about statistics.

It is recommended that this investigation be replicated and extended using all sport management journals and that multiple indicators will be used for assessing the state of the literature. Critical self-examination followed with improvement and enhancement will positively influence the credibility and acceptance of sport marketing as a field of study.

Future investigations should be replicated using the studies published in other sport marketing journals (i.e., *International Journal of Sports Marketing and Sponsorship*). Similar reviews for other sport marketing journals are important. With such important information, sport marketing academicians can begin to address these issues and enhance the body of literature for the advancement of the field. Moreover, assessments of the body of literature in sport marketing should include sport marketing papers published in journals other than sport marketing journals, sport marketing literature published in conference proceedings, and material published in academic books and textbooks. Assessment of the entire body of knowledge will offer a more exhaustive and thus accurate analysis of the body of literature.

It is also suggested that studies be extended to include a wider variety of research methodology and techniques other than what was used in the current investigation. The use of statistical data analysis techniques is only one indicator of research direction and the sophistication of methodology. In future studies, the analyses of other categories should be included, such as (a) the type of research hypotheses (directional or nondirectional); (b) sampling procedures (e.g., sim-

ple random sampling and stratified sampling, etc.); (c) population and sample size; (d) psychometric measurement (validity and reliability); and (e) research design (experimental and nonexperimental design). These are categories selected from some of the earlier studies (Grazer & Stiff, 1987; Swanson & Alford, 1987). Such categories were also defined and summarized in several research methodology and statistics textbooks (DePoy & Gitlin, 1994; Gall et al., 2003; Hinkle et al., 1994; Howell, 1999; Leedy & Ormrod, 2001; McMillan & Schumacher, 2001; Neuman, 2003).

Lastly, it is hoped that the current investigation will inspire discussion among students and faculty, as well as practitioners concerning the state of the literature in sport marketing. Moreover, we hope that these discussions will lead to ideas that will address all aspects of the literature and will eventually extend to research and other scholarly activity to continue the contribution to the expansion and enhancement of the literature as it continues its path to maturity.

References

- Baloglu, S., & Assante, L. M. (1999). A content analysis of subject area and research methods used in five hospitality management journals. *Journal of Hospitality & Tourism Research*, 23(1), 53–70.
- Barber, E. H., Parkhouse, B. L., & Tedrick, T. (2001). A critical review of the methodology of published research in the *Journal of Sport Management* from 1991 through 1995 as measured by selected criteria. *International Journal of Sport Management*, 2(3), 216–236.
- Baumberger, J. P., & Bangert, A. (1996). Research designs and statistical techniques used in the *Journal of Learning Disabilities*, 1989–1993. *Journal of Learning Disabilities*, 29(3), 313–316.
- Baumgartner, T. A., Strong, C. H., & Hensley, L. D. (2002). *Conducting and reading research in health and human performance* (3rd ed.). Boston: McGraw-Hill.
- Best, J. W., & Kahn, J. V. (1998). *Research in education* (8th ed.). Boston: Allyn & Bacon.
- Chelladurai, P. (1992). Sport management: Opportunities and obstacles. *Journal of Sport Management*, 6, 215–219.
- Conover, W. J. (1999). *Practical nonparametric statistics* (3rd ed.). New York: Wiley.
- Cornwell, T. B., & Maignan, I. (1998). An international review of sponsorship research. *Journal of Advertising*, 27(1), 1–21.
- Cozby, P. C. (1992). *Methods in behavioral research* (5th ed.). Mountain View, CA: Mayfield.
- Crawford-Welch, S., & McCleary, K. W. (1992). An identification of the subject areas and research techniques used in five hospitality-related journals. *Hospitality Management*, 11(2), 155–167.
- Creswell, J. W. (2003). *Research design: Qualitative and quantitative approaches* (2nd ed.). Thousand Oaks, CA: Sage.
- Dann, G., Nash, D., & Pearce, P. (1988). Methodology in tourism research. *Annals of Tourism Research*, 15(1), 1–28.
- DePoy, E., & Gitlin, L. N. (1994). *Introduction to research*. St. Louis, MO: Mosby Year Book.
- Douvis, J., & Douvis, S. (2000). A review of the research areas in the field of sport marketing: Foundations, current trends, future directions. *The Cyber-Journal of Sport Marketing*, 4(3). Retrieved December 13, 2004, from <http://pandora.nla.gov.au/nph-arch/2000/Z2000-Aug6/http://www.cjism.com/vol4/douvis43.htm>
- Edgington, E. S. (1974). A new tabulation of statistical procedures in APA journals. *American Psychologist*, 29, 25–26.
- Elmore, P. B., & Woehlke, P. L. (1988). Statistical methods employed in *American Educational Research Journal*, *Educational Researcher*, and *Review of Educational Research* from 1978 to 1987. *Educational Researcher*, 17(9), 19–20.
- Gall, M. D., Gall, J. P., & Borg, W. R. (2003). *Educational research: An introduction* (7th ed.). Boston: Pearson Education.
- Gerstner, C. R., & Day, D. V. (1997). Meta-analytic review of leader-member exchange theory: Correlates and construct issues. *Journal of Applied Psychology*, 82, 827–844.
- Goodwin, L. D., & Goodwin, W. L. (1985a). An analysis of statistical techniques used in the *Journal of Educational Psychology*, 1979–1983. *Journal of Educational Psychology*, 20(1), 13–21.
- Goodwin, L. D., & Goodwin, W. L. (1985b). Statistical techniques in *AERJ* articles, 1979–1983: The preparation of graduate students to read the educational research literature. *Educational Researcher*, 14(2), 5–11.
- Grazer, W. F., & Stiff, M. R. (1987). Statistical analysis and design in marketing journal articles. *Journal of the Academy of Marketing Science*, 15(1), 69–73.
- Hinkle, D. E., Wiersma, W., & Jurs, S. G. (1994). *Applied statistics for the behavioral science*. Boston: Houghton Mifflin.
- Howell, D. C. (1999). *Fundamental statistics for the behavioral sciences* (4th ed.). Pacific Grove, CA: Duxbury Press.
- Hoyer, W., Raskind, C., & Abrahams, J. (1984). Research practices in the psychology of aging: A survey of research published in *Journal of Gerontology*, 1975–1982. *Journal of Gerontology*, 39, 44–48.
- Jamieson, L. M., Ross, C. M., & Swartz, J. E. (1994). Research in recreational sports management: A content analysis approach. *NIRSA Journal*, 19(1), 12–14.
- Kang-Park, J., & Sieben, W. A. (1993). Research methods and statistical techniques in articles on social psychological aspects of clothing, 1970–1985. In S. J. Lennon & L. D. Burns (Eds.), *Social science aspects of dress: New directions* (pp. 185–196). Monument, CO: International Textile and Apparel Association.
- Kieffer, K. M., Reese, R. J., & Thompson, B. (2001). Statistical techniques employed in *AERJ* and *JCP* articles from 1988 to 1997: A methodological review. *The Journal of Experimental Education*, 69(3), 280–309.
- Kirk, R. E. (1978). *Introductory statistics*. Monterey, CA: Brook/Cole.
- Leedy, P. D., & Ormrod, J. E. (2001). *Practical research: Planning and design* (7th ed.). Upper Saddle River, NJ: Merrill/Prentice Hall.
- Mahony, D. F., & Pitts, B. G. (1998). Research outlets in sport marketing: The need for increased specialization. *Journal of Sport Management*, 12, 259–272.
- McMillan, J. H., & Schumacher, S. (2001). *Research in education: A conceptual introduction* (5th ed.). New York: Longman.
- Mondello, M. J., & Pedersen, P. M. (2003). A content analysis of the *Journal of Sports Economics*. *Journal of Sports Economics*, 4(1), 64–73.
- Neuman, W. L. (2003). *Social research methods: Qualitative and quantitative approaches* (5th ed.). Boston: Pearson Education.
- Nunnally, J. C. (1967). *Psychometric theory*. New York: McGraw-Hill.
- Olafson, G. A. (1990). Research design in sport management: What's missing, what's needed? *Journal of Sport Management*, 4(2), 103–120.
- Parkhouse, B. L., Ulrich, D. O., & Soucie, D. (1982). Research in sport management: A vital rung of the new corporate ladder. *Quest*, 34(2), 176–186.
- Parks, J. B. (1992). Scholarship: The other 'bottom line' in sport management. *Journal of Sport Management*, 6, 220–229.
- Paton, G. (1987). Sport management research: What progress has been made? *Journal of Sport Management*, 1(1), 25–31.
- Pedersen, P. M., & Pitts, B. G. (2001). Investigating the body of knowledge in sport management: A content analysis of the *Sport Marketing Quarterly*. *The Chronicle of Physical Education in Higher Education*, 12(3), 8–9, 22–23.
- Pitts, B. G. (2001). Sport management at the millennium: A defining moment. *Journal of Sport Management*, 15, 1–9.
- Pitts, B. G., & Danylchuk, K. E. (2004). *Assessing the body of knowledge in sport management: A preliminary descriptive study of current sport management books*. Paper presented at the annual conference of the

- European Association for Sport Management, Ghent, Belgium, September, 2004.
- Pitts, B. G., & Pedersen, P. (2003). Examining sport management scholarly literature: A Content analysis of the *Journal of Sport Management*. Presentation at the annual scholarly conference of the European Association for Sport Management, Stockholm, Sweden, September 12-15, 2003.
- Pope, N. (1998). Overview of current sponsorship thought. *The Cyber-Journal of Sport Marketing*, 2(1). Retrieved December 13, 2004, from <http://pandora.nla.gov.au/nph-arch/1999/Z1999-Nov-1/http://www.cjism.com/Vol2/pope21.htm>
- Reid, L. J., & Andereck, K. L. (1989). Statistical analyses use in tourism research. *Journal of Travel Research*, 27(2), 21-24.
- Riddick, C. C., DeShriver, M., & Weissinger, E. (1984). A methodological review of research from *Journal of Leisure Research* from 1978 to 1982. *Journal of Leisure Research*, 16(4), 311-321.
- Runyon, R. P., Coleman, K. A., & Pittenger, D. J. (2000) *Fundamentals of behavioral statistics*. Dubuque, IA: McGraw-Hill.
- Scandura, T. A., & Williams, E. A. (2000). Research methodology in management: Current practices, trends, and implications for future research. *Academy of Management Journal*, 43(6), 1248-1264.
- Shannon, J. R. (1999). Sports marketing: An examination of academic marketing publication. *Journal of Services Marketing*, 13, 517-534.
- Slack, T. (1996). From the locker room to the board room: Changing the domain of sport management. *Journal of Sport Management*, 10, 97-105.
- Soucie, D., & Doherty, A. (1996). Past endeavors and future perspectives for sport management research. *Quest*, 48, 486-500.
- Sport Marketing Association. (2003). *Supplement abstract of completed research*. SMA Inaugural Conference. Gainesville, FL.
- Sport Marketing Quarterly. (2004). Mission statement. *Sport Marketing Quarterly*, 13(1), p 1.
- Stokes, C., & Miller, M. (1975). A methodological review of research in *Rural Sociology* since 1965. *Rural Sociology*, 40, 411-434.
- Stone-Romero, E. F., Weaver, A. E., & Glenar, J. L. (1995). Trends in research design and data Analytic strategies in organizational research. *Journal of Sport Management*, 21(1), 141-157.
- Swanson, H. L., & Alford, L. (1987). An analysis of the current status of special education research and journal outlets. *Remedial and Special Education*, 8(6), 8-18.
- Van Doren, C., & Heit, M. (1973). Where it's at: A content analysis and appraisal of the *Journal of Leisure Research*. *Journal of Leisure Research*, 5, 67-73.
- Wilson, V. L. (1980). Research techniques in *AERJ* articles: 1969-1978. *Educational Researcher*, 9(6), 5-10.
- Zakrajsek, D. B. (1993). Sport management: Random thoughts of one administration. *Journal of Sport Management*, 7(1), 1-6.
- Zeigler, E. F. (1987). Sport management: past, present, future. *Journal of Sport Management*, 1, 4-24.

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