A DEMONSTRATION OF METHODS TO IDENTIFY THE PRESENCE OF NONRESPONSE ERROR IN SURVEY RESEARCH

Brian A. Turner
Jeremy S. Jordan
Aubrey Kent

Surveys are an important and often used method of data collection in sport management research (Jordan, Walker, Kent, & Inoue, 2011; Olafson, 1990) and the social sciences in general, due primarily to the fact that they can provide information not easily attainable through other methods (Werner, Praxedes, & Kim, 2007). A review of articles published from 2009-2011 in three prominent sport management journals, the *Journal of Sport Management, Sport Management Review*, and the *European Sport Management Quarterly*, supports the notion that survey research is an often used method of data collection in the field. Specifically, of the 242 articles that were published during this time period, 92 (38%) have utilized survey research methods, supporting the contention that survey research is a prominent data collection method in the discipline. However, the value of survey research is impacted in large measure by the willingness of individuals to participate, low response rates are a consistent concern among those who conduct, analyze, consume, or act on survey results (Kano, Franke, Afifi, & Bourque, 2008). Low response rates increase the likelihood of systematic bias in a study, decrease statistical power, increase the confidence intervals around the sample statistics, and limit the types of statistical analyses that can be conducted (Dillman, Smyth, & Christian, 2009; Jordan et al., 2001; Rogelberg & Luong, 1998; Rogelberg & Stanton, 2007; Rogelberg et al., 2003). A low response rate can also undermine the perceived credibility of the study and cause consumers of the research to question key findings. More importantly, a low response rate can threaten the external validity of the study due to the existence of nonresponse error (i.e., bias introduced when information obtained from respondents is significantly different from what would have been gathered from nonrespondents). When nonresponse error exists, survey results can produce misleading conclusions that are not representative of the larger population. Thus, in order to infer findings

back to a population, researchers must conduct nonresponse analyses and demonstrate through the results of these tests that this error type was not a threat, providing assurance that findings obtained from the sample were truly representative of the population.

Unfortunately, recent reviews of survey research in the social sciences (Bartlett, Bartlett, & Reio, 2008; Dooley & Lindner, 2003; Kano et al., 2008; Werner et al., 2007) have revealed that nonresponse analysis is generally not included as part of the research design, and thus nonresponse error is largely ignored, resulting in a significant limitation on generalizability. Recently, Jordan et al. (2011) examined the frequency of nonresponse analyses in articles published in the *Journal of Sport Management* from 1987-2008. Of the 371 articles published during this time 162 (43.7%) articles were based on studies that utilized probability sampling procedures and survey methods resulting in 172 separate data collections. Of these, Jordan and colleagues suggested that 144 needed to address the threat of nonresponse (due to having <85% response rate). From these 144, it was determined that only 31 (21.5%) studies mentioned nonresponse error as a threat to external validity, and only 13 (9%) actually reported performing any type of nonresponse analysis, thus calling into question the external validity of the other 131(91%) studies. Jordan et al. highlighted the importance of addressing nonresponse error and called for further examination on what methods might work best for sport management researchers. This call for review echoes previous assertions of Paton (1987), Costa (2005), and Chalip (2006) who all identified the need to improve the rigor of research methods used in sport management through the process of review and testing. So, while the threat of nonresponse error is not unique to sport management, it is a significant concern given the high frequency of survey methods used in the field combined with the lack of attention to this source of error (Jordan et al., 2011). Continuing their efforts to promote discourse on the threat of nonresponse error within the sport management field, the present study demonstrates the utility of three methods of nonresponse analysis most often used in sport management (Jordan et al.) with the objective of establishing convergent results as a way to identify the presence of nonresponse error.

Literature Review

Threats from Nonresponse

The threat of nonresponse error results from obtaining information from respondents that is systematically different from others in the sample and thus, the population in general. Stated another way, nonresponse error is the impact of those that do not respond on the estimation to the population (Miller & Smith, 1983). Nonresponse error can pose a threat to the external validity of a study in situations where a researcher fails to obtain a response rate of 100%. The likelihood of achieving this level of response in survey research that incor-

porates some form of random sampling is highly unlikely (Rogelberg & Stanton, 2007), and therefore it is the responsibility of researchers to "design the study with the intent of collecting and reporting information about nonresponse and its effects on survey results" (Kano et al., 2008, p. 480). Campion (1993) suggested that editors and reviewers need to ensure that published studies have adequate response rates, and that authors have made reasonable efforts to maximize participation and establish that the influence of nonrespondents does not pose a threat to the generalizability of study findings. To this end, some scholars have posited a minimum response threshold that could be deemed acceptable. This search for the "elusive acceptable response rate" (Rogelberg & Stanton, 2007, p. 196) is problematic for a number of reasons. First, there is inconsistency as to what has been deemed an appropriate response rate, one that establishes that nonresponse error poses a minimal threat to the external validity of a study (Baruch & Holtom, 2008). What has been suggested as an acceptable response rate has ranged from a low of 50% (Fowler, 1984) to a high of 90% (Miller & Smith, 1983), with some scholars suggesting 85% as a response rate sufficient enough to offset the threat of nonresponse error (Dooley & Lindner, 2003; Lindner et al., 2001; Werner et al., 2007). A related concern on the topic of a minimum response rate is that these proposed thresholds are based on assertions rather than empirical support (Baruch & Holtom, 2008; Rogelberg & Stanton, 2007). While it is true that the threat of nonresponse error decreases with a higher response rate, researchers are unable to completely rule out the existence of this threat without some form of nonresponse analysis. Given the preceding discussion, we would reiterate the recommendation of Jordan et al. (2011) that researchers in sport management utilize nonresponse analysis techniques for all studies (which use probability sampling and survey methods) where the response rate fails to meet the threshold of 85%.

Another justification often used in published research is that the obtained response rate for a given study is consistent or exceeds that of similarly related research. Rogelberg and Stanton (2007) addressed this issue stating, "…although such descriptions do put a response rate into context, the fact that everyone else also achieves 30%, 40%, or 50% response does not help to demonstrate that the reported research is free from nonresponse bias" (p. 198). The response rate of a study is a representation of quantity rather than quality (Wilcox, Bellenger, & Rigdon, 1994) and as such does not provide insight about the presence, magnitude, or direction of nonresponse error in a study. Conversely, a study that achieves a low response rate, one that could be perceived as a "fatal flaw", does not by itself represent the presence of nonresponse error. Thus, researchers, editors, and reviewers who minimize the validity of results based on a low response rate without first addressing whether the low response rate truly had an impact on the findings of the study have done a

disservice to the consumers of the scholarship (Rogelberg & Stanton, 2007).

Handling Nonresponse

According to Dillman et al. (2009) there are four sources of error that pose potential threats in survey research. These four (sampling error, coverage error, measurement error, and nonresponse error) were referred to by Dillman et al. as the "cornerstones for conducting a quality survey" (p. 9). As any one type of error increases the results and recommendations of the study become increasingly suspect and less representative of the larger population (see Dillman et al., 2009, for a review of the sources of error). Of the four types of error, nonresponse has received the least amount of attention by researchers and journal editors (Dooley & Lindner, 2003; Lindner et al., 2001; Rogelberg & Stanton, 2007). However, despite this lack of attention, there remains a need to address the issue of nonresponse, especially in sport management research, where survey methods are a common procedure for data collection (Jordan et al., 2011).

Controlling for nonresponse error begins with implementing a research design that incorporates, a priori, a plan for handling nonresponse (Lindner et al., 2001), which would include a data collection methodology designed to maximize participation (Dillman et al., 2009). Following this, a researcher will either achieve a response rate sufficient enough to conclude that nonresponse error is not a threat to the external validity or have obtained a response rate that necessitates the inclusion of nonresponse analyses. Further, researchers need to be prepared to explain what methods were used to test for nonresponse error, the results of these tests and the remediation of any differences. It is noteworthy that while many have identified the importance of addressing nonresponse error (Armstrong & Overton, 1977; Miller & Smith, 1983; Rogelberg & Luong, 1998; Werner et al., 2007), in large part, this threat has routinely been overlooked by authors and editorial boards. For example, Lindner et al. (2001) found in *the Journal of Agricultural Education* that 50% of the reviewed articles where nonresponse error posed a threat to the external validity of the study failed to mention the threat, or include appropriate nonresponse analyses. Similarly, Dooley and Lindner (2003) found in *Human Resource Development Quarterly* that 60% of the articles reviewed that should have included nonresponse analysis did not mention this type of error. Consistent with these two studies, Werner et al. (2007) reviewed a variety of business journals from three different tier rankings and found that in the aggregate, only one third of the relevant articles mentioned nonresponse error as a threat to external validity. The findings from these studies are consistent with others (Bartlett et al., 2008; Jordan et al., in press; Kano et al., 2008) that have found for the most part there has been minimal mention of nonresponse error and a general lack of nonresponse analysis in survey research. These authors as well as others

(cf., Miller & Smith, 1983; Rogelberg et al., 2003; Rogelberg & Stanton, 2007) have called for researchers to include nonresponse analyses as part of the research design of studies when appropriate. Additionally, there has been a call for editorial boards to establish standards and expected actions of researchers for handling this type of threat to external validity (Baruch & Holtom, 2008; Rogelberg & Stanton, 2007).

Methods of Nonresponse Analysis

A majority of the early discussion on nonresponse error identified the perceived difficulty of making valid estimates of survey nonrespondents. However, ensuing research established several strategies that could be employed in an attempt to reduce the impact of nonrespondents (cf., Bartlett et al., 2008; Linder et al., 2001; Rogelberg & Stanton, 2007; Werner et al., 2007). Armstrong and Overton (1977) were among the first to suggest that it is possible to garner information about nonrespondents through various extrapolation methods (i.e., a process of estimating nonresponse bias based on statistical analyses). These authors proposed three different methods for conducting nonresponse analysis: (1) comparing known values of the population with that of respondents; (2) subjective estimates based on comparisons between respondents and nonrespondents on known values; and (3) extrapolation based on time trends and waves of responses. The work of Armstrong and Overton served as the basis for additional research on the topic, most notably by Miller and Smith (1983), who suggested five methods of nonresponse analysis: (1) ignore nonrespondents; (2) compare respondents to the population on characteristics of interest known a priori; (3) compare respondents to nonrespondents on characteristics of interest known a priori; (4) compare early to late respondents on core study variables; and, (5) sample nonrespondents a second time. As noted, the first strategy proposed by Miller and Smith is ignoring nonrespondents, and has been the method most often employed for articles published in the *Journal of Sport Management* (Jordan et al., 2011). This strategy is only appropriate when a researcher has obtained a response rate sufficient enough to eliminate the threat of nonresponse error. Because the majority of survey research fails to achieve a 100% response rate or meet the response rate thresholds that have been proposed as minimum standards (e.g., 85%) this study tested the utility of implementing three of the four strategies proposed by Miller and Smith (1983). The decision was made to not sample nonrespondents a second time as it was not appropriate for the research design used in this study. The present study was part of a larger project which examined, in part, the response rates of collegiate coaches based on the time of year. The stratification of the sample based on the time of year restricted us from contacting nonrespondents after data collection was completed. Additionally, the method of nonresponse analysis was not implemented in the

present study due to the increased cost and time requirements associated with this method. Further, oversampling was a concern as participants in this study received multiple invitations to participate in the study and thus an additional request did not seem appropriate and likely would have been viewed as a nuisance by participants. What follows is a description of the three methods of nonresponse analysis used in this study as a means to identify the presence of nonresponse error.

Method 1: Compare respondents to the population. This method requires that the researcher have access to information regarding different characteristics of the population of interest. Access to this information will allow the researcher to make comparisons between respondents and the population in an effort to identify any significant differences between groups (Dooley & Lindner, 2003; Miller & Smith, 1983). Normally this process involves comparisons based on demographic variables such as age, sex, race, marital status, and other characteristics retrieved from an archival database (e.g., membership information) prior to the initiation of the study. While this method of nonresponse analysis provides valuable insight on how respondents compare with the larger population, it is limited in that no information is obtained on how the groups differ on the dependent variables of the study (Rogelberg & Stanton, 2007). The analysis is based on the implicit assumption that "differences in independent variables are associated with differences in dependent variables" (Kano et al., 2008, p. 481). However, it is important to note that the presence of difference between two groups does not necessarily indicate nonresponse error. This type of error only occurs when independent variables for which difference was found are directly related to dependent variables being measured in the study. For example, any differences found based on household income level are only relevant if related to the topic(s) of interest for a particular research study (Rogelberg & Stanton, 2007). Therefore, researchers comparing respondents to the larger population must make sure that variables used for comparison are related to the objectives of the study.

Method 2: Compare respondents to nonrespondents. Similar to method one, this strategy for nonresponse analysis involves univariate comparisons between groups on independent variables relevant to the purpose of the study. As mentioned previously, these variables are often demographic characteristics that can be obtained from sources other than the study survey. Again, caution should be used when making inferences based on these comparisons, as information does not reveal differences based on the dependent measures of the study. However, this method of analysis does provide insight into any differences between groups and if related to the objectives of the study, should be controlled in some manner by the researcher.

Comparison between respondents and nonrespondents can also occur by utilizing the follow-up approach. This

method involves randomly selecting and resurveying a small portion of nonrespondents (normally with an abridged version of the survey) by phone, mail or e-mail. When using this method of analysis, Dooley and Lindner (2003) suggest that in order to conduct the appropriate analyses between the two groups, a minimum of 20 responses be obtained from the initial nonrespondents. The collection of data from the follow-up sample allows the researcher to make comparisons between groups on both independent and dependent variables. While an advantage of this method is that it allows for meaningful comparisons between groups on actual survey topic variables, it is important to note that any observed differences might be the result of method effects rather than true characteristics of nonrespondents (Rogelberg & Stanton, 2007).

Method 3: Compare early to late respondents. An additional method proposed by Miller and Smith (1983) involves comparison of early and late respondents. By noting when surveys are returned, researchers can separate respondents into different categories. Normally classification of early and late respondents is based on whether the survey was returned prior to any follow-up methods employed as a means to maximize participation. This method, also referred to as wave analysis (Kano et al., 2008; Lindner et al., 2001; Rogelberg & Luong, 1998), considers those individuals who respond after the initiation of a maximization strategy to be high effort respondents who most closely resemble nonrespondents. This extrapolation strategy considers nonrespondents to be a linear extension of those participants that respond at the end of the data collection cycle. Therefore, any differences between early and late respondents can be inferred back to nonrespondents. An additional way to compare early and late respondents is to code "days to respond" as a continuous variable and use it as an independent variable in a regression equation with the dependent variables of the study. Finally, if no follow-up techniques are utilized, Lindner et al. (2001) suggest operationally defining late respondents as those individuals who are in the later 50% of respondents and then conducting comparisons. While many have suggested that late respondents can serve as reasonable proxies for nonrespondents (Dooley & Lindner, 2003; Kano et al., 2008; Lindner et al., 2001; Miller & Smith, 1983) this method is limited in that late respondents are not "pure nonrespondents" based on their participation in the study and as such cannot conclusively, by itself, indicate the presence of nonresponse error. Rogelberg and Luong (1998) addressed this concern stating, "although this approach may be useful for determining whether some bias exists, it cannot accurately estimate the magnitude of the bias" (p. 63). Therefore, in an attempt to overcome the limitations associated with each of the proposed methods of nonresponse analysis researchers should include multiple methods and seek convergence of results.

Multiple methods. While the majority of survey researchers in the social sci-

ences fail to include assessments of nonresponse error (Baruch & Holtom, 2008; Rogelberg & Stanton, 2007), those who do address the issue often use only one method of analysis (Kano et al., 2008). While completely ignoring the threat of nonresponse error is generally not appropriate in survey research, the inclusion of only one method of analysis is also a potential limitation. Werner et al. (2007) discussed the problem of only using one method of analysis, suggesting "…the quality of analyses could further affect our faith in the generalizability of findings of many studies. Issues such as how many variables are compared, the convergence (i.e., consistency) of the findings, the relevance of those variables, the nature of the comparisons, the nature of the population, and the statistical tests used may all affect the quality of nonresponse analyses"(p. 293). The issue is similar to that of amassing evidence for validity as each of the different validation methods (e.g., convergent validity) provides unique insights but each has its own strengths and weaknesses. There is no one conclusive approach and no single source of evidence that is capable of combating all forms of threat. Rogelberg and Stanton (2007) promoted the inclusion of multiple methods of analysis stating, "assessing the impact of nonresponse bias requires development and inclusion of different types of evidence, and the case for nugatory impact of nonresponse bias is built on multiple pieces of evidence that converge with one another" (p. 199). Further, the statistical method chosen by the researcher can influence the magnitude and direction of the bias estimate, as each method of analysis is based on different assumptions (e.g., late respondents are an appropriate proxy for nonrespondents). Therefore, in order to obtain a robust and balanced assessment of nonresponse error, researchers should use multiple methods of analysis when determining the impact of nonrespondents and by amassing convergent evidence for external validity will strengthen confidence in the findings obtained from the study (Kano et al., 2008).

METHOD

Once again, the purpose of the present study was to demonstrate the utility of using three methods of nonresponse analysis with the objective of establishing convergent results as a way to identify the presence of nonresponse error.

Participants

As part of a larger project on survey research, a stratified, random sample of Division I head coaches (95% confidence level with a sampling error of ± 5%) was selected to participate in the current study. Specifically, head coaches from one men's and one women's sport (chosen based on the highest number of institutions sponsoring each sport) from each of the three NCAA seasons (fall, winter, and spring) were randomly selected to be in the sample (N = 950). The selected head coaches from football (n = 84), women's volleyball (n = 175), men's basketball (n = 190), women's basketball

(n = 183), baseball (n = 164), and softball (n = 154) were sent emails with a link to an online questionnaire. After two weeks, nonrespondents were sent a follow-up email reminding them of the study. A total of 269 head coaches (28.3%) completed the questionnaire.

Procedures

A spreadsheet was created to input data of interest for this study. The names of all 950 coaches in the sample were included in the first column, while their email address was in the second column. The third column was used to track responses (0 = no; 1 = yes, and before follow-up email; 2 = yes, after follow-up email). A research assistant also gathered the following information (from a variety of internet sources) and input the information into the spreadsheet: a) coaches' age; b) years of coaching experience; c) career won/loss record; and d) prior season's won/loss record. The online survey software allowed the researchers to track responses by respondent's email address. Once a questionnaire was completed, a "1" was put into the response column of the spreadsheet if it was returned before the initial two week deadline and a "2" if it was returned after the follow-up email was sent. At the conclusion of data collection, a "0" was put into the response column for those who had not responded. The columns with the coaches' names and email addresses were then deleted.

RESULTS

Comparing Respondents to the Population

Miller and Smith (1983) suggested gathering information on the population, such as age, sex, and socioeconomic status when attempting to compare respondents to the larger population. This could prove difficult with a sample of intercollegiate athletic coaches because of the mobility in this profession. For example, there were 22 coaching changes (out of 120 programs) in the Division I Football Bowl Subdivision in 2009 ("2009 college football coaching changes," 2009). However, with coaching samples there is a common variable that can be used to compare a group to the population—season winning percentage. As a zero-sum proposition (i.e., one team wins and one team loses in every contest), in any given season the population's average winning percentage will be .500. In the current study, the average winning percentage was .490. Using a one-sample t-test, the respondent's mean winning percentage was not significantly different from the hypothesized value of .500, t(267) = -.912, p = .362, r = .06.

One might assume that the same would be true for career winning percentage. However, it should be higher than .500 because coaches with low winning percentages will normally not be retained. In the current sample, the average career winning percentage of the responding coaches was .523.

Comparing Respondents to Nonrespondents

A second method suggested by Miller and Smith (1983) is a comparison of respondents to nonrespondents on specific variables of interest. As previously mentioned, characteristics of the sample were gathered (age, number of years coaching, career winning percentage, and prior season winning percentage). According to Miller and Smith, if nonrespondents are not statistically different from the respondents, the results of a study can be generalized to the sample and population. Independent samples *t*-tests were used to compare respondents and non-respondents. Results showed no significant differences on any of the variables mentioned above (see Table 1), so the respondents were deemed similar to the sample and the population.

Comparing Early to Late Respondents

Finally, Miller and Smith (1983) suggested late respondents are often similar to nonrespondents. Therefore, if late respondents are not significantly different from individuals that respond early, results obtained from all respondents can be inferred back to nonrespondents, thereby controlling for nonresponse

Table 1
Comparison of Respondents and Non-Respondents on Variables of Interest

	Respondent's Average (*SD*)	Non-Respondent's Average (*SD*)	*t*	*p*
Age	45.23 (8.88)	46.23 (9.03)	1.45	.149
Head Coaching Experience	11.51 (8.25)	10.57 (8.03)	1.61	.107
Career Winning Percentage	.523 (.14)	.526 (.14)	.23	.821
Prior Season Winning Percentage	.490 (.18)	.504 (.19)	1.10	.272

Table 2
Comparison of Late Respondents and Non-respondents on Variables of Interest

	Respondent's Average (*SD*)	Non-Respondent's Average (*SD*)	*t*	*p*
Age	44.81 (7.99)	46.23 (9.03)	1.62	.105
Head Coaching Experience	10.92 (8.03)	10.57 (8.03)	.46	.645
Career Winning Percentage	.525 (.15)	.526 (.14)	.09	.931
Prior Season Winning Percentage	.493 (.19)	.504 (.19)	.66	.510

Table 3
Comparison of Early and Late Respondents on Variables of Interest

	Respondent's Average (*SD*)	Non-Respondent's Average (*SD*)	*t*	*p*
Age	45.63 (9.69)	44.81 (7.99)	.75	.452
Head Coaching Experience	12.08(8.43)	10.92 (8.03)	1.15	.251
Career Winning Percentage	.522 (.13)	.525 (.15)	.13	.895
Prior Season Winning Percentage	.487 (.18)	.493 (.19)	.26	.794

bias. For this study, late respondents were defined as those who completed the questionnaire after the initial deadline (and after a follow-up email was sent). A total of 132 respondents (49.1% of the returns) were classified as late. Independent samples *t*-tests were again used, this time to compare late respondents and nonrespondents. There were no significant differences on any of the four variables collected (see Table 2); consequently, and congruent with Miller and Smith, late respondents were similar to nonrespondents. Finally, another independent samples *t*-test was conducted comparing early and late respondents. There were no significant differences in these two groups (see Table 3), so the respondents were comparable to the random sample.

DISCUSSION

While the primary objective of the current study was to demonstrate the importance of addressing nonresponse error in survey research, a secondary objective was to continue the discourse initiated by Jordan et al. (2011) on methods to identify the presence of nonresponse error in sport management research. Specifically, we tested three methods of nonresponse analysis proposed by Miller and Smith (1983), given that nonresponse is one of the four main sources of error in survey research (Dillman et al., 2009) yet has received the least amount of attention (e.g., Bartlett et al., 2008). There are many factors that contribute to the quality of survey research. These include components of the questionnaire or data collection instrument, characteristics of the population, appropriateness of sampling techniques and analytical procedures and whether the respondents are truly representative of the population (Kano et al., 2008). Of these factors, the issue of demonstrating that respondents are an accurate representation of the population has generally been overlooked in the social sciences (Bartlett et al., 2008; Baruch & Holtom, 2008; Kano et al., 2008; Rogelberg et al., 2003) including sport management (Jordan et al., in press). Improving research methods and

scholarship in sport management requires that those who are part of the discipline periodically review the research methods and techniques employed. Paton (1987) was among the first to identify the need for strengthening sport management research, a concern later reiterated by both Costa (2005) and Chalip (2006). In this light, constructive effort to evaluate the methodological rigor employed by sport management scholars seems a necessary ongoing step towards strengthening the field.

In the sport management literature it appears that more emphasis has been placed on response rates rather than efforts to handle the threat of nonresponse error (Kent & Turner, 2002; Turner & Jordan, 2008; Turner, Jordan, & Sagas, 2006). The response rate achieved by a study is a contributing factor to the relative quality of the research, as there is an inverse relationship between the response rate and the presences of systematic bias (Bartlett et al., 2008; Rogelberg et al., 2003). Nevertheless, as indicated by Rogelberg and Stanton (2007) "response rate alone is an inaccurate and unreliable proxy for study quality" (p. 198). These authors go on to state:

We do not advocate that improving response rates is a quixotic goal but rather that researchers' major efforts and resources should go into understanding the magnitude and direction of bias caused by nonresponse. We advocate that researchers should conduct a nonresponse bias impact assessment, regardless of how high a response rate is achieved. (p. 198-199)

Therefore, the issue of nonresponse error in the sport management literature should receive more attention by individuals conducting the research, editorial boards reviewing the work, and those that are consumers of the research.

The relatively low response rate achieved in this study could be perceived by many as having a detrimental impact on the validity of the study and thus the generalizability of the findings. It is noteworthy that the response rate (28.3%) achieved is fairly consistent with other studies that have examined the population of intercollegiate coaches (e.g., Cunningham, Fink, & Sagas, 2005; Cunningham & Sagas, 2004; Farneti, Christy, & Turner, 2009; Kent & Turner, 2002; Turner et al., 2006). However, as indicated by Rogelberg and Stanton (2008), a response rate consistent with previous research utilizing a similar population or having parallel objectives does not constitute a measure of data quality or reveal the presence of nonresponse error. Therefore, as discussed previously, researchers are encouraged to disconfirm the presence of nonresponse error by demonstrating convergence of findings obtained from the utilization of multiple methods of analysis. Such an endeavour was initiated in the present study and findings from the three forms of analysis confirmed that respondents where indeed similar to nonrespondents as well as the larger population. Despite having less than one third of the sample participate in the study we were able to demonstrate that the respondents were similar to nonrespondents, as well as the larger

population. By utilizing multiple methods of analysis, the limitations associated with each method were overcome. The tables included clearly show negligible differences amongst the groups (i.e., effect size values), thereby offering assurance that no Type-II errors were made in concluding no group differences existed in the sample.

In the present study, respondents were compared with nonrespondents and the population of interest on several characteristics, one of which was winning percentage. While directly related to objectives of this study, it is unlikely that this variable could be used as a measure for comparison with studies not involving coaches. However, in a similar manner, researchers should identify characteristics for comparison relevant to the objectives of the study and population of interest. Following this, researchers should locate and access information related to these characteristics for the purpose of conducting nonresponse analyses. For this to be possible researchers must include as part of the research design, mechanisms for testing the impact of nonrespondents. A common practice is to include various demographic variables as basis for comparison (Armstrong & Overton, 1977; Dooley & Lindner, 2003; Miller & Smith, 1983). For example, variables such as age, length of employment, socioeconomic status, race, marital status, and education are often used for comparison (Rogelberg & Luong, 1998; Rogelberg & Stanton, 2007), but have been inconsistent in their ability to detect difference across various studies. Researchers in sport management are encouraged to include demographic measures, if directly related to the core variables of the study, and/or measures of other characteristics relevant to the purpose of the study (e.g., winning percentage in the present study).

Limitations and Future Research

This study demonstrated the utility of three methods for nonresponse analysis proposed by Miller and Smith (1983), which represent the three most common approaches for identifying nonresponse error (e.g., Bartlett et al., 2008; Dooley & Lindner, 2003; Lindner et al., 2001; Rogelberg & Stanton, 1998; Werner et al., 2007). The methods chosen for this study were done so on the basis of being relevant to the objectives of the study and thus an appropriate component of the overall research design. Please note that these are certainly not the only forms of analysis or that they necessarily constitute best practices for nonresponse analysis. For example, Rogelberg and Stanton (2007) recently proposed a conceptual outline of a nonresponse bias impact assessment strategy (N-BIAS) composed of nine techniques for nonresponse analysis. The first three techniques proposed by these authors were discussed previously and tested as part of this study. The remaining six techniques are new approaches to nonresponse analysis and are based on recent research findings (see Rogelberg & Stanton, 2007 for a review of the nine techniques). While the N-BIAS approach is based on current understanding of

nonresponse bias, it does represent new methods for handling this type of error and as such needs to be empirically tested. Sport management researchers are encouraged to investigate the feasibility of incorporating multiple techniques from N-BIAS as a means to control nonresponse error and advance current knowledge on how best to demonstrate that data are representative and without substantive bias.

Examination of nonresponse error with other samples will help to determine if findings from this study can be confirmed with other populations, given the delimitation of having only utilized coaches in the current study. One limitation of the current study is that a single data source doesn't allow for cross-sample comparisons which might reveal differentiated effectiveness among the methods. In addition, it is notable that this study did not attempt to address the underlying reasons that nonresponse occurs and the influence this can have on the external validity of a particular study. Survey nonresponse can occur for a number of reasons; however there is consensus among many scholars that nonrespondents can be grouped into two general categories (Kano et al., 2008; Rogelberg et al., 2003). The first category of nonresponse is passive in nature and can represent a decreased threat to the external validity of study findings. This form of nonresponse is not based on a conscious or overt decision to refrain from participation in a research study but rather occurs for random reasons. For example, a passive nonrespondent could be an individual who fails to complete a survey questionnaire because of lack of time or forgetfulness. The second classification of nonresponse, termed active nonresponse, is the result of an individual making a conscious decision to not return the survey questionnaire. This refusal is non-random and normally occurs immediately upon receiving the solicitation for participation (Kano et al., 2008). Although passive nonrespondents can be influenced by techniques intended to maximize participation (e.g., Dillman's Tailored Design Method) individuals that purposefully withhold their involvement are generally resistant to these efforts (Rogelberg et al., 2003). There is a limited amount of research on the motives for nonresponse; however, preliminary work does suggest that nonrespondents in the passive group most closely resemble respondents, while those in the active group are normally quite different (Kano et al., 2008; Rogelberg et al., 2003; Rogelberg & Stanton, 2007). Therefore, researchers should not assume that all nonrespondents are the same but rather attempt to gather as much information about this group as possible to more clearly understand the reasons for nonresponse. There is a need for researchers to determine the underlying reasons for nonresponse in sport management as way to more completely understand the phenomena.

Failing to address the issue of nonresponse error will continue to limit the external validity of much of the research published in sport management journals. The methods utilized in this study

are consistent with those proposed by Miller and Smith (1983) and supported by scholars in other academic disciplines (e.g., Bartlett et al., 2008; Dooley & Lindner, 2003; Lindner et al., 2001; Rogelberg & Luong, 1998; Werner et al., 2007). If through subsequent research it is discovered that these methods or others that have been proposed, are effective in addressing nonresponse error, they should become established practice and editorial boards should evaluate academic scholarship, in part, based on the inclusion of nonresponse analyses when appropriate. While there is no way to completely eliminate the threats of this (and other) sources of error, we can at least be assured that we have mitigated the risk. If ineffective in addressing the issue, work should be initiated which seeks deeper understanding of what methods will most appropriately address nonresponse error and the threat it poses to the external validity of sport management research.

REFERENCES

2009 college football coaching changes (2009, March 14). Retrieved from http://www.collegefootballpoll.com/coaching_changes_2009.html.

Bartlett, J.E., Bartlett, M.E., & Reio, T.G. (2008). Analysis of nonresponse bias in research for business education. *The Delta Pi Epsilon Journal, 50,* 45-58.

Baruch, Y., & Holtom, B.C. (2008). Survey response rate levels and trends in organizational research. *Human Relations, 61,* 1139-1160.

Campion, M.A. (1993). Article review checklist: A criterion checklist for reviewing research articles in applied psychology. *Personnel Psychology, 46,* 705-718.

Chalip, L. (2006). Towards a distinctive sport management discipline. *Journal of Sport Management, 20,* 1-20.

Costa, C.A. (2005). The status and future of sport management: A Delphi study. *Journal of Sport Management, 19,* 117-142.

Cunningham, G. B., Fink, J. S., & Sagas, M. (2005). Extensions and further examinations of the job embeddedness construct. *Journal of Sport Management, 19,* 319-335

Cunningham, G.B., & Sagas, M. (2004). Group diversity, occupational commitment, and occupational turnover intentions among NCAA Division IA football coaching staffs. *Journal of Sport Management, 18,* 236-254.

Dillman, D.A., Smyth, J.D., & Christian, L.M. (2009). *Internet, mail, and mixed-mode surveys: The tailored design method.* (3rd ed.). Hoboken, NJ: John Wiley & Sons.

Dooley, L.M., & Lindner, J.R. (2003). The handling of nonresponse error. *Human Resource Development Quarterly, 14,* 99-110.

Farneti, C., Christy, K., & Turner, B.A. (2009). Examining role conflict among Division III head men's and women's basketball coaches. *International Journal of Sport Management, 10*(1), 68-81.

Jordan, J.S., Walker, M.B., Kent, A., & Inoue, Y. (2011). The frequency of

nonresponse analyses in the Journal of Sport Management. *Journal of Sport Management, 25,* 229-239.

Kano, M., Franke, T., Afifi, A.A., & Bourque, L.B. (2008). Adequacy of reporting results of school surveys and nonresponse effects: A review of the literature and a case study. *Educational Researcher, 37,* 480-490.

Kent, A., & Turner, B.A. (2002). Increasing response rates among coaches: The role of pre-notification methods. *Journal of Sport Management, 16,* 230-238.

Lindner, J.R., Murphy, T.H., & Briers, G.E. (2001). Handling nonresponse in social science research. *Journal of Agricultural Education, 42*, 43-53.

Miller, L.E., & Smith, K.L. (1983). Handling nonresponse issues. *Journal of Extension, 21*(5), 45-50.

Olafson, G.A. (1990). Research design in sport management: What's missing, what's needed? *Journal of Sport Management, 4,* 103-120.

Paton, G. (1987). Sport management research—What progress has been made? *Journal of Sport Management, 1,* 25-31.

Rogelberg, S.G., Conway, J.M., Sederburg, M.E., Spitzmuller, C., Aziz, S., & Knight, W.E. (2003). Profiling active and passive nonrespondents to an organizational survey. *Journal of Applied Psychology, 88,* 1104-1114.

Rogelberg, S.G., & Luong, A. (1998). Nonresponse to mailed surveys: A review and guide. *Current Directions in Psychological Science, 7,* 60-65.

Rogelberg, S.G., & Stanton, J.M. (2007). Understanding and dealing with organizational survey nonresponse. *Organizational Research Methods, 10,* 195-209.

Turner, B.A., & Jordan, J.S. (2008, May). The utility of online questionnaires for conducting research on intercollegiate athletic coaches. Paper presented at the annual meeting of the North American Society for Sport Management (NASSM), Toronto, Ontario.

Turner, B.A., Jordan, J.S., & Sagas, M. (2006). Factors affecting response rates in survey research: The case of intercollegiate coaches. *Applied Research in Coaching & Athletics Annual, 21,* 211-237.

Werner, S., Praxedes, M., & Kim, H.G. (2007). The reporting of nonresponse analyses in survey research. *Organizational Research Methods, 10,* 287-295.

Wilcox, J.B., Bellenger, D.N., & Rigdon, E.E. (1994). Assessing sample representativeness in industrial surveys. *Journal of Business and Industrial Marketing, 9,* 51-61.

Dr. Brian Turner teaches at The Ohio State University.
Dr. Jeremy Jordan and Dr. Aubrey Kent are on the faculty at Temple University.