Meta-Analysis in Sport Management Research: A Quantitative Systematic Review

Carolina Salge, University of Georgia
Kevin Byon (Advisor), University of Georgia
Thomas A. Baker (Advisor), University of Georgia

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Meta-analysis is a statistical tool used to combine results reported in empirical studies that are independent from each other (Rosenblad, 2009). Results of properly conducted meta-analyses are used to better understand why existing studies have produced inconsistent results in their own stream of research. For example, Palmatier, Dant, Grewal, and Evans (2006) used meta-analysis to examine which relationship marketing strategies were most effective for building strong relationships, and the conditions in which relationship marketing was most effective for generating positive seller outcomes. By understanding which strategies were most effective firms could increase return on investments while researchers could build more comprehensive models of how relationship marketing strategies influence performance (Palmatier et al., 2006). The example illustrates the implications of a meta-analysis for both practitioners and researchers. Yet, Palmatier et al's (2006) study is just one of many meta-analyses conducted in the marketing field. Even though meta-analysis is a common practice in marketing and psychology,no meta-analysis has ever been conducted in sport management. The dearth of meta-analysis research is a major drawback hampering both statistical and methodological advancements in sport management research. Accordingly, the purpose of this study was to address any potential issues that limit or prevent the use of meta-analysis in the sport management field.

Another goal was to promote the use of meta-analysis by demonstrating its value along with a detailed description of each step in how the process is conducted, which involves: (1) retrieving studies, (2) inclusion criteria, (3) calculating effect sizes, (4) z-test, confidence interval and heterogeneity of effects, (5) testing for publication bias, (6) moderator analyses, and (7) presenting results: forest plots. Three main advantages of meta-analysis are also discussed in our presentation: (a) detection of publication bias, (b) the increase of statistical power, and (c) transparency. According to Wilson and Lipsey (2001), meta-analysis is useful in detecting publication bias due to an inadequate representation of studies with a large degree of sampling error. A bias in publication can cause an overestimation of the calculated effect size, which would provide the reader with a result that does not represent the true effect size (Cohn & Becker, 2003). The precision with which a researcher is able to detect the significance of an effect highly depends on the sample size. By estimating an effect size for each study and comparing the effects among each other (assigning greater weight to larger studies), meta-analysis produces statistically more powerful estimation. Another advantage lies in transparency. A well-conducted meta-analysis reveals all procedures followed throughout the process of calculating mean effect sizes.

Despite its numerous merits, some disadvantages exist in the use of a meta-analysis. Weaknesses of meta-analysis include the fact that the process: (a) is time consuming, (b) can mix apples and oranges, and (c) can include criteria (study selection) bias. A well-developed meta-analysis literature review takes into account all published studies (sometimes unpublished as well, it depends of the author's inclusion criteria) and this procedure is extremely rigorous and time consuming. The process also requires substantial effort in careful study selection, where one must decide which articles can be used or not. Once the proper studies are selected, the researcher must decide which type of effect size to choose from (e.g., Hedges'd, odds ratio, correlation "r", etc) and calculate the studies' effect sizes. Meta-analysis is often criticized for the risk of comparing studies that used quite different measures (e.g., open ended questions vs. Likert type scales to measure constraints). Only measures that possess similar construct operationalization and scale can be combined and statistically compared to each other. Otherwise, mean effect sizes no longer become meaningful as they incorporate aggregation over incomparable study results. Perhaps a more troublesome weakness in meta-analysis is that the process could include studies of different methodological quality (e.g., study design, performance, and analysis). Several critics argue that the inclusion of flawed studies (e.g., weak research design) with high quality studies will degrade overall results (e.g., Wilson & Lipsey, 2001). On the other side, marketing scholars argue about the importance of including unpublished as well as published studies to reduce publication bias and increase the representativeness of the effect sizes being aggregated (Steven & Son, 2008). Either

way, it is difficult to agree on what incorporates high methodological quality as there is no standard process for selecting studies to be included in a meta-analysis. Accordingly, researchers are allowed to create their own study selection criteria; yet, they are highly advised to report in great detail the complete process of selecting studies, which can then be summarized by a flow diagram (Moher, 2009).

In this study we demonstrated a step-by-step procedure as to how to conduct a meta-analysis to provide readers with a quantitative summary of empirical studies related to perceived constraints on sport and leisure consumption through participation. Leisure constraints were chosen given its dense research in sport management. Articles published from August 1992 to October 2011, were identified and inclusion criteria incorporated English-language articles, measurements of leisure constraints and sport/leisure consumption, existence of a comparison group, and published articles from refereed journals only. Ten effects were computed from 5 studies. Eight effects included comparisons between certain types of participation (e.g., weekly participation) versus no participation at all. The remaining two effects included daily participation versus weekly participation and daily versus monthly participations. The mean (SD) age was 35 (SD = 24) years. The mean percentage of women was 51.15% (SD = 21.69%). Effect sizes were calculated by subtracting the mean of the comparison group from the treatment group, and dividing the difference by the pooled standard deviation (Lipsey & Wilson, 2001). Then, the correction for small sample size bias was adjusted and calculated so that an increase in constraints would imply a decrease in sport and leisure consumption. The random effects model was used to calculate mean effect size delta (Δ) and to test for variation in effects according to two moderator variables (age and constraint type). All effects were found to be inverse, and below zero. Type of constraints was statistically significant when explaining some of the variation of effects ($p = .02$) while both age and the interaction term were found to be non-significant ($p = .33$, $p = .58$, respectively). The number of studies included in our meta-analysis is rather small (5), not because we failed to add contributing articles, but because a majority of research on constraints in sport management/leisure did not report statistical results that are necessary to be included in a meta-analysis. For instance, twenty-seven other studies could have been added to the current meta-analysis if it weren't for their methodological/reporting limitations. With adequate study reporting and methodology, researchers can take advantage of the benefits that meta-analysis can offer, which include the aggregation of results over time, detection of publication bias, higher statistical power, and transparency.

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