Mediating or Confounding: A Caveat on Theory Development in Sport Management

Luke Lunhua Mao, University of New Mexico

Theory represents a critical element in the advancement of sport management discipline (Chalip, 2006; Cunningham, 2013; Doherty, 2013) and provides the foundation for sport management practices (Doherty, 2013; Irwin & Ryan, 2013). One defining characteristic of theory is that it postulates the interrelationships between concepts (constructs) and provides a systematic view about a phenomenon (Kerlinger & Lee, 2000). More often than not, a theory involves the revelation of causal mechanisms. A common framework for the analysis of causal mechanism has been mediation analysis (Baron & Kenny, 1986; Imai, Keele, Tingley, & Yamamoto, 2011).

In social science, many important insights have been gained from mediation analyses. For instance, attitudes are found to mediate the relationship between beliefs and behavioral intentions (Fishbein & Ajzen, 1975), which suggests that any intervention or educational program designed to change or reinforce the beliefs of people has to eventually channel towards the formulation of attitude. Behavioral intention can hardly be influenced without firstly influencing the attitude. In marketing, it is found that the effect of corporate social responsibility (CSR) on firm’s market value is mediated by customer satisfaction (Luo & Bhattacharya, 2006), which suggests that CSR may backfire if it fails to enhance customer satisfaction when conducting CSR activities. Another example in general marketing is that the impact of country image on consumer purchase intention is mediated by category product image (Li, Wang, Jiang, Barnes, & Zhang, 2014), which suggests the foci of marketing communication should be on category image. In summary, mediation analysis has provided significant implications for marketing and management practices.

Mediation analysis has also been routinely conducted by sport management researchers. The efforts of conducting mediation analysis is not something trivial. Collectively, they represent one aspect of our striving to advance the discipline of sport management. There are numerous examples. Need for affiliation is found to mediate personality traits and team identification (Donavan, Carlson, & Zimmerman, 2005); team identification mediates the relationship between vicarious achievement motive and BIRGing and CORFing behaviors (Kwon, Trail, & Lee, 2008); enjoyment mediates the motivation of sports participation and level of commitment (Casper, Gray, & Stellino, 2007); curiosity mediates the relationship between knowledge and intention to watch novel sport game (Park, Mahony, Kim, & Do Kim, 2014); and team identification mediates the relationship between self-serving attribution bias and satisfaction (Madrigal & Chen, 2008). However, a scrutiny of sport management literature reveals that mediation analysis has also routinely misconducted. Particularly, in quite some studies, an identified mediator might be more qualified as confounder.

A simple mediation is about two causal relationships that relating an independent variable (IV) to a mediator (M), and relating the mediator to a dependent variable (DV) (Imai et al., 2011). In order to claim that a relationship is causal, there are three conditions a relationship has to meet: (a) covariation of the presumed cause and the presumed consequence; (b) the presumed cause must proceed the presumed consequence; and (c) no alternative explanation (De Vaus, 2001). Statistically, the detection of mediation requires four conditions: (a) a significant relationship exists between the independent variable and the mediator; (b) a significant relationship exists between the mediator and the dependent variable; (c) a significant relationship exists between the independent variable and the dependent variable; and (d) when the mediator and independent variable are used simultaneously to predict the dependent variable, the previously significant path between the independent variable and the depend variable will be significantly reduced (Baron & Kenny, 1986).

Unfortunately, statistically, mediation is not differentiable from confounding. A confounder is a variable related to two variables of interest that falsely obscures or accentuates the relationship between them (Meinert, 2012). A spurious relationship often arises between an IV and a DV because of the failure to account for a confounding variable. For instance, in athletic skill research, the height of vertical leap was related to a measure of bench press performance. When age was included in the model, the effect was significantly reduced (Goldberg et al., 1996).
is a confounder in this relationship. The symptom of confounding is exactly same as mediation statistically: After a third variable introduced, the existing relationship becomes weaker. Mediation and confounding can be distinguished only on conceptual grounds (MacKinnon, Krull, & Lockwood, 2000). Confounding does not necessarily imply a causal relationship among the variables. And fundamentally, confounder is not an intermediate variable in the causal relationship. Therefore, if a causal relationship between IV and presumed mediator cannot be justified on theoretical and statistical grounds, the “mediator” essentially is a confounder.

The confusion of confounding and mediating creates serious problems for theory development and management practices. The threat to theory development is obvious as it relates the truth of a theory. The threat to practical implications are more subtle. For instance, team identification is believed to mediate the relationship between having a stadium naming rights and fans’ anger towards the deal (Reysen, Snider, & Branscombe, 2012), which implies that having a stadium naming rights have direct impact on fans’ identification and fans’ anger can be mitigated by lowering their identification. The recommendation is not constructive to marketers. However, supposing identification merely a confounder, then marketers can attribute fans’ anger more to identification than to having a naming right. The managerial implication has greater clarity in the later case. Hence, we should give due attention to this critical issue when conceptualize and conduct our research.

The purposes of this study presentation to: (a) examine the existing theoretical mediating relationships in sport management literature; (b) discuss the importance of differentiating mediation and confounding effects; (c) discuss the problems with cross-sectional design in mediation research; and (d) provide methodological guidelines to conduct mediation research. The presentation will report the results based on an analysis of about 100 studies in sport management literature using mediation analysis, and will focus on the methodological recommendations.