Explaining Attendance through Social Network Analysis: The Effect of Centrality and Team Identification on Continued Game Attendance

Matthew Katz, University of Massachusetts Amherst
Bob Heere, University of South Carolina
Rose Marie Ward, Miami University

Marketing Friday, June 3, 2016 20-minute oral presentation
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Abstract 2016-203 2:05 PM (Legacy South 3)

Much of the sport marketing literature has focused on individual-level of measures and examined sport fans in isolation of the networks they belong to, with extensive lines of research measuring psychological constructs such as team identification (Lock, Funk, Doyle, & McDonald, 2014), team loyalty (Funk & Pastore, 2000), game satisfaction (Yoshida & James, 2010), service quality (Murray & Howat, 2002), and social media usage (Filo, Lock, & Karg, 2015), all in hopes of better understanding the markers and predictors of sport fan behavior. Yoshida, Heere and Gordon (2015) suggested recently that doing so might be a mistake, as their study with Japanese soccer spectators demonstrated that other fans were the only strong predictor of attendance, and that individual attitudes such as attachment, team identity, service quality, and behavioral intentions were not able to serve as significant predictors. Similarly, Katz and Heere (2013; 2015) showed that game attendance was often the result of being part of a particular network, rather than an attitude towards a sport team.

Much of individual behavior is inherently embedded in networks of interpersonal relations (Granovetter, 1985), yet the salience of fan-to-fan relationships has remained largely ignored in the sport fan literature. As Christakis and Fowler (2009) wrote, research that ignores the salient role of networks is not up to the task of understanding the modern world since “social networks affect every aspect of our lives” (p. 304). Accordingly, the purpose of this study is create and analyze the network of individual attendees of an intercollegiate ice hockey team in order to examine to what extent a network of sport fans can predict attendance of each individual fan. Social networks have emerged as one of the defining paradigms of the social sciences (Prell, 2012), and this study is part of the growing recognition that social network characteristics (most notably, centrality in the network) play a key role in understanding sport fan behavior. Therefore, to further examine the role of fan-to-fan relationships in the sport consumption process, the researchers used a social network approach to examine both the horizontal relationships between individuals (i.e. social network analysis), and the vertical relationship between individuals and the team (i.e. team identity) and the ability of both constructs to explain attendance of students at college hockey games. This lead to the following hypotheses:

H1: The centrality of a fan within the network positively affects attendance.

H2: The level of team identification of a fan positively affects attendance.

H3: Centrality more strongly affects attendance than team identification

From a mid-sized Midwestern university, 843 participants were recruited as part of a larger study. A majority of the sample reported being female (n = 503, 59.7%). The average age of the sample was 20.42 (SD = 1.55). The sample represented all academic years (Freshmen, n = 231, 27.4%; Sophomore, n = 195, 23.1%; Junior, n = 183, 21.7%; Senior, n = 187, 22.2%; Fifth year/Graduate Student, n = 46, 5.5%). A large portion of the sample indicated that they were fraternity or sorority members (n = 270, 32.0%). Only a few of the participants reported being NCAA varsity athletes (n = 72, 8.5%). One of the inherent difficulties in studying networks is identifying the boundary of a network and consequently defining the population of the study. For this analysis, our population consisted of all student attendees of the university hockey team’s home games during the 2014-2015 season. Students who attend a home game are required to scan their student IDs upon entry and the university athletic department uses these scans to generate a list of student attendees. With the assistance of the athletic department, we combined the student attendance logs from each individual games to create a dataset of every individual students who attended a game.

In order to measure team identification, we used the Team*ID scale (Heere & James, 2007). We specifically chose this instrument to measure team identification because it is a multi-dimensional instrument. Research both in and
outside of sport management have shown that multidimensional instruments allow for a more accurate depiction of identification (Ashmore et al., 2004; Lock et al., 2014). For this study, we used degree centrality, generally considered the most intuitive form of centrality. Degree centrality is interpreted as a measure of an actor’s level of involvement in a network (Prell, 2012). An actor with a larger degree centrality statistic is in direct contact or adjacent to many other actors and is recognized as a major channel of relationship information. Degree centrality is comprised of in-degree centrality, the number of ties received by an actor from others in the network, often used as a measurement for prestige and popularity, and out-degree centrality, the number of ties given by a particular actor to other, often considered a measure of expansiveness (Prell, 2012).

The relations between the Team*ID scales, measures of spectator centrality, and attendance were assessed within a structural equation modeling framework using Mplus version 7.31 (Muthen & Muthen, 1998–2015). The model fit the data $\chi^2 (n = 843, 181) = 698.39$, CFI = .94, TLI = .93, RMSEA = .06. Addressing the proposed hypothesis between network centrality and attendance, spectator central was a significant predictor of attendance ($\beta = .47$, $P<.001$), support our hypothesized link between network embeddedness and sport fan behavior. Moreover, the relationship between team identification and attendance was supported by the model, as Team ID was a significant predictor of attendance as well ($\beta = .25$, $P<.001$). Finally, the results of the model support our final hypothesis that spectator centrality was a stronger predictor of attendance than Team ID, as centrality explained roughly 22% of the variance in attendance while identification was only able to explain for 6%.

Consistent with the qualitative findings of Katz and Heere (2013; 2015), the results from Hypotheses 1 and 3 support the importance of fan-to-fan relationships in exploring sport fan behavior and the need for a network theory of sport fanship. Considering the majority of sport fan research that emphasizes team identification while largely ignoring fan-to-fan relationships, this finding is noteworthy. Human behavior is embedded in social networks (Granovetter, 1985), and consumption within the context of sport is no exception. Given all of the behaviors that researchers have correlated with network locations, ranging from obesity to divorce to happiness (Christakis & Fowler, 2009), the empirical support for Hypotheses 1 and 3 should help advance the network theory of sport fanship. A fan’s relationship with other fans is a significant predictor of attendance; thus examinations of sport fan behavior need to extend beyond merely individual-level analysis.

Our goal was not to understand the entire relationship between networks and fan behavior, but rather to start a conversation about new ways to conceptualize and analyze sport fans. In many ways, the network built and analyzed in this study is most valuable as a benchmark for future researchers. Network statistics like density, connectivity, and centralization are most valuable when used to compare similar networks, and we hope other scholars will similarly build and analyze networks of other fans in different contexts. Once such analyses are possible, we can better understand the types of network structures sport managers and marketers need to be weary of, the structures sport managers want to try and promote, and compare both the short and long-term behaviors of different fan networks.