Journal of Sport Management, 2018, 32, 362-375
https://doi.org/10.1123/jsm.2017-0318

Human Kinetics
ARTICLE

Are Sport Consumers Unique? Consumer Behavior Within Crowded Sport Markets

Hunter Fujak and Stephen Frawley
University of Technology Sydney

Heath McDonald
Swinburne University of Technology

Stephen Bush
University of Technology Sydney

Sport consumers and markets have traditionally been thought to exhibit unique behaviors from traditional consumer products, particularly in respect to perceptions of loyalty. Yet, despite sport landscapes becoming increasingly crowded, there has been scant research measuring consumers' repeat behavior in the context of the dense sports market. Through this research, we address this gap by applying Dirichlet modeling against the behaviors of 1,500 Australian sport consumers. Two questions are explored: First, do sport attendance markets exhibit purchase characteristics distinct from typical consumer markets? Second, do consumers treat sport leagues as complimentary or substitutable goods? The results provide evidence that consumer patterns within the sport attendance market are consistent to other repeat-purchase consumer markets. This finding further diminishes the long-held notion that sport requires unique methods of management. Furthermore, it was found that fans consume sport teams as complimentary products. As sport teams largely share their fans with other teams, practitioners must reorient their expectations around fan loyalty.

Keywords: consumer markets, Dirichlet, duplication of purchase, repertoires, sport leagues

Commercial and technological developments within the sport and media industries have facilitated considerable growth in the opportunities to consume sport. Accordingly, the value of the North American sport market is projected to be valued at $71.6 billion in 2018 (PricewaterhouseCoopers, 2015). Along with new consumption formats, commercialization has also led to an expansion in volume of teams and leagues competing for consumer hearts and wallets (James, Kolbe, & Trail, 2002). As Byon, Zhang, and Connaughton (2010) noted, "with such a crowded sport marketplace, sport consumers have many options in which to spend their leisure time and discretionary dollars. As a result, professional sport organizations face stiff competition in an effort to gain market share" (p. 143).

Although there appears to be consensus that sport markets are increasingly competitive and crowded (McDonald, Karg, & Lock, 2010), there appears to be scant research that attempts to quantify the behavior and structure of such crowded sport markets (Field, 2006). The scarcity of such research is particularly surprising given the centrality of competition to the sport sector: "Managing the implications of competition, both on and off the field, is a critical success factor and a strategic imperative in its own right. Competition, therefore, is the heart and soul of sport management" (Shilbury, 2012, p. 2). Although sport consumption has emerged as a vital area of research, the field has largely focused on fan behavior within individual sports rather than the consumer markets in which teams compete (Pelnar, 2009). Through this research, we begin to remedy this shortcoming by undertaking an analysis of sport consumer behavior within sport markets that feature a high degree of consumption choice.

Corresponding to an increase in off-field competition, sport has continued along a path away from leisurely pastime toward organized business practice, resulting in increasingly professional management strategies (Robinson, 2008). Yet, as sport management becomes increasingly sophisticated, contention surrounds whether corresponding strategies should be based upon broader management principles or specialized from within the sport management discipline (Chalip, 2006; Costa, 2005). In relation to whether sport belongs as a distinct field of academic enquiry, Chalip (2006) notes "The fundamental concern has therefore been whether sport management is a unique discipline or is one that merely derives applications from theories originating in the so-called 'home disciplines'" (p. 2).

The defense of sport management as a distinct field has largely been underpinned by the articulation of unique attributes innate to the discipline, which require distinct management practices (Baker, McDonald, & Funk, 2016). Neale's (1964) identification of the peculiar economics of professional sport confirms that such articulation does not represent a new endeavor. However, more contemporary management-orientated research by Stewart and Smith (1999, 2010) have identified that although sport retains unique attributes, these unique elements are often overstated, can be found in other products and markets, and have diminished over time. Nonetheless, these unique attributes appear to still largely underpin

Fujak, Frawley, and Bush are with the University of Technology Sydney, Sydney, New South Wales, Australia. McDonald is with the Swinburne University of Technology, Hawthorn, Victoria, Australia. Address author correspondence to Hunter Fujak at Hunter.fujak@uts.edu.au.

sport management. Baker et al. (2016) point to numerous widely used introductory sport management and marketing textbooks (e.g., Mullin, Hardy, & Sutton, 2014; Pedersen & Thibault, 2014) that include chapters discussing the uniqueness of sport, suggesting the uniqueness remains an integral component of the sport management self-narrative.

One feature of the sport market that has historically been considered to distinguish it from other industries is the perceived loyalty and passion of sport consumers. Distinct from the typical rational decision-making consumer, the sport product has historically been positioned as an "ephemeral experience mired in the irrational passions of fans, commanding high levels of product and brand loyalty, optimism and vicarious identification" (Smith & Stewart, 2010, p. 3). Although such characterization of sport fans provides for a simple narrative, the degree to which sport consumers in fact exhibit particularly unique consumer behaviors is becoming increasingly disputed. Observational evidence in fact suggests that supporting multiple sport teams is possible, if not common, although vigorous academic confirmation of such has yet to occur (Baker et al., 2016; McDonald et al., 2010). This represents a significant theoretical disconnect, given that consumer buying behavior in other highly competitive repeat-purchase industries, such as fast-moving consumer goods (FMCG) and professional services, has now been well defined (Ehrenberg, Uncles, & Goodhardt, 2004). Significantly, such research has provided evidence that consumer behavior across many varied competitive industries conform to consistent behavioral patterns that result in predictable market structures (Bound, 2009). Whether such behavioral predictability occurs in a sporting context has largely yet to be addressed, though it is highly significant given the long-held belief that sport consumers in fact display unique behaviors.

Thus, through this research, we attempt to address this critical gap by providing a quantitative analysis of consumer behavior in two crowded sport markets where multiple teams and leagues compete. This is achieved by adopting Ehrenberg's (1971) well-established framework of buyer behavior within repeat-purchase markets, utilizing the negative binomial distribution (NBD) Dirichlet model of market analysis (Bassi, 2011). The core research purpose therefore is to understand sport consumption patterns within selected geographic markets and is underpinned by two key research questions (RQs):

RQ1: Do sport consumer markets exhibit purchase characteristics typical of repeat-buying consumer markets?

RQ2: Do consumers treat sporting teams as complimentary or substitutable goods?

The paper is presented in five parts. The first part examines the relevant literature in respect to consumer markets and sport landscapes. The second part outlines the methods deployed in this study. Subsequently, the third part of the paper includes the data analysis, and the fourth part has the research findings and their implications. The fifth and final part concludes with ideas for future research.

Literature Review

Consumer Behavior in Repeat-Purchase Markets

Owing to its financial significance, consumer behavior in repeat-purchase markets represents a comprehensively researched academic field (Sharp, Wright, & Goodhardt, 2002). Critical to the field is the work of Ehrenberg (1971), who found that an NBD was well fit to analyze the market level data of industries in which consumers made repeat purchases. Goodhardt, Ehrenberg, and Chatfield (1984) developed this into the functional "Dirichlet" model—a model theorizing that buyers have steady buying propensities and that these buying propensities vary across the population according to certain statistical distributions (Bound, 2009). To measure this, the Dirichlet adopts a stochastic distribution in predicting probabilistically both the number of purchases a buyer will make and the probability of each brand being bought on each purchase occasion in a particular time period (Goodhardt et al., 1984). This model would later be developed into accessible Excel-based software by Kearns (2000) and later into R programming language by Chen (2008).

The Dirichlet model has been found to be highly generalizable and is considered one of the most validated models in the business marketing domain (Uncles, Ehrenberg, & Hammond, 1995). Sharp et al. (2002) noted that Dirichlet-type patterns have been found across over 50 varied product and service categories and remain valid both across countries and longitudinally. Ehrenberg et al. (2004) provide a comprehensive summary of the breadth of such research, although some illustrative examples are provided further below. Considerable focus, however, has centered on the FMCG market given its repeat-purchase nature (Dawes, 2016; Ehrenberg, Goodhardt, & Barwise, 1990; Ehrenberg et al., 2004; Uncles et al., 1995). Aside from being highly generalizable, Dirichlet modeling has also been found to be relatively robust when applied in settings that depart from the model's underlying assumptions. One such assumption toward which the model appears robust is that the market of analysis is stationary in nature, which does not reflect commercial reality in most instances (Ehrenberg, 2000; Wright & Sharp, 1999).

A key to the Dirichlet model is the parsimonious manner by which it validates multiple empirical marketing generalizations and/or principles. Sharp et al. (2002) distinguished five such generalizations the body of research has validated and which the NBD-Dirichlet model accurately predicts: First, differences in market share are largely due to differences in penetration—higher share brands are bigger largely because they have more customers than lower share brands. This illustrated within Erhenberg et al.'s (2004) analysis of the U.S. coffee market from 1992. The third (Taster's Choice) and fourth (Nescafe) largest brands held distinct market shares of 17% and 11% despite similar average annual purchase rates (2.8 vs. 2.7). Rather, the source of their divergent market share was resultant from their differing annual penetration rate: 9% compared with 6%. Second, the comparatively small differences between brands in average purchase frequency and other loyalty statistics follow the double-jeopardy pattern identified by McPhee (1963): Not only do small brands have fewer buyers, but also these buyers are slightly less loyal. This was the case in the Italian beer market between 2001 and 2004 (Bassi, 2011). Market leading brand Moretti (market share of 14.48%) held a 12.05% proportion of solely loyal buyers, compared with market laggard Bud (0.81% market share) with 8.79% solely loyal buyers (Bassi, 2011). Third, a brand's customers, on average, buy other brands more often. This is because most customers buy from a repertoire of brands. This generalization is evident within Singh and Uncles (2016) analysis of the U.K. breakfast cereal market. Although Kellogg's Corn Flakes was the market leading brand (9% market share), it accounted for only a 16% share of its customer's annual cereal consumption requirements. Fourth, solely loyal buying (i.e., the proportion of customers who only buy one brand) is relatively rare and declines over time. Within the Australian retail

fuel industry, for instance, the average rate of solely loyal buying was found to be 8.3% (Sharp et al., 2002). Solely loyal buyers are also lighter buyers of the overall category while, by contrast, heavier buyers tend to buy more brands but are less likely to be solely loyal. Fifth, brands share their customers with other brands in line with each brand's penetration—this is known as the duplication of purchase law. These empirical principles represent the key measures tested within RQ1 (see Table 1).

In relation to the fourth empirical marketing generalization, Sharp et al. (2002) observed that repeat-purchase markets are polarized by either repertoire- or subscription-buyer behaviors. Repertoire-pattern markets are characterized by consumers who satisfy their consumption requirements from within a repertoire of brands. Notably, these buyers are described as exhibiting *polygamous loyalty,* which represents a departure from much of traditional marketing literature classifying consumers dichotomously as either "loyal" or "switchers." In contrast, subscription-market patterns differ in that consumers typically allocate most of their category to one provider. This has been found to be the case for instance in the credit card market, in which the average rate of solely loyal usage was found to be 79% in New Zealand (Sharp et al., 2002). Notably, from empirical observation to date, there do not appear be any markets that occupy the middle ground between these two extremes. The distinction between repertoire and subscription markets has significant implications for marketing practice. Brands competing within repertoire markets are more likely to share customers with competitors, impacting the strategic orientation of marketing initiatives such as loyalty programs (Uncles, Dowling, & Hammond, 2003). Within repertoire markets, a brand is better served to increase its penetration within the market than attempting to develop solely loyal buyers. Brands within subscription markets should focus on minimizing customer switching and maximizing new customer gain (Sharp et al., 2002).

Sport Consumer Behavior in Crowded Sport Markets

Despite the application of the previously discussed generalized marketing principles in a variety of empirical settings, sport markets are only beginning to receive similar academic attention (Baker et al., 2016; Funk, Alexandris, & McDonald, 2016). More typically, research surrounding sport consumers has focused upon developing typologies and continuums to define their connection to individual teams and sports (Funk & James, 2001; Giulianotti, 2002; Mahony, Madrigal, & Howard, 2000; McDonald & Milne, 1997; Mullin, Hardy, & Sutton, 1993, 2014; Tapp & Clowes, 2002). However, although such sport segmentation models have become robust in understanding fandom toward single sports and teams, they do not address consumer behavior in the context of choice across sport brands at a market level.

The scarcity of holistic sport market research is perhaps of some surprise, given that the sector represents a particularly noteworthy field for such endeavor due to widely debated contention around the degree to which sport contains unique product and marketing characteristics that distinguish it from other industries (Baker et al., 2016). Researchers have previously postulated that such empirical generalizations may not necessarily hold in the case of professional sport team brands (Gladden & Funk, 2001). In contrast, some researchers consider sport team supporters to exhibit loyalty patterns similar to those in nonsport contexts (Tapp, 2004). Smith and Stewart (2010) provided an evaluation of these special features and their advocates, conflating 10 distinct features from the original work of Stewart and Smith (1999) into four dimensions in their follow-up critique. These are as follows:

a. Sport is a heterogeneous and ephemeral experience mired in the irrational passions of fans, commanding high levels of product and brand loyalty, optimism, and vicarious identification.
b. Sport favors on-field winning over profit.
c. Sport is subject to variable quality, which in turn has implications for the management of competitive balance and anticompetitive behavior.
d. Sport has to manage a fixed supply schedule (Smith & Stewart, 2010, p. 3).

Overall, Smith and Stewart's (2010) critique considered the uniqueness of sport to be overstated and having diminished since their initial postulations. In relation to the first dimension, while they now consider sport consumption behavior to be an exemplar rather than exception of contemporary consumer behavior, they note: "Sport is still characterized by fierce, loyal, and passionate fans who experience a strong, vicarious identification with their players and teams. It remains one of the few products that delivers engaging experiences that become part of our collective memory" (p. 10). Despite broad acceptance that sport to some degree retains idiosyncratic features, it is unclear whether sport markets do, in fact, behave differently than other industries in real-world settings.

Among the first such papers to have tested broader consumption patterns is that of McDonald and Stavros (2007), who observed that the season ticket holder (STH) product category appears to be characteristic of a subscription market. They noted that "in sporting clubs, consumers rarely 'switch' teams; thus, the issue is not one of attracting customers away from competitors, but rather reengaging, maintaining, or increasing the level of participation of supporters" (2007, p. 219). The authors, however, largely measured the attitudes of existing and lapsed members rather than consumers' propensity to hold multiple memberships therefore precluding the possibility of Sharp et al.'s (2002) polygamous loyalty. Similarly, McDonald (2010) measured the churn rates of STHs among several Australia Football League (AFL) teams, once again capturing consumers' propensity to shift along the continuum

Table 1 List of Generalized Marketing Principles

Principle	Description
1	Differences in market share are largely due to differences in penetration—higher share brands are bigger largely because they have more customers than lower share brands.
2	The comparatively small differences between brands in average purchase frequency and other loyalty statistics follow a double jeopardy pattern: not only do small brands have fewer buyers but also these buyers are slightly less loyal.
3	A brand's customers, on average, buy other brands more often. This is because most customers buy from a repertoire of brands.
4	Solely loyal buying (i.e., the proportion of customers who only buy one brand) is relatively rare and declines over time.
5	Brands share their customers with other brands in line with each brand's penetration—this is known as the Duplication of Purchase Law.

Note. Adapted from "Purchase Loyalty Is Polarised Into Either Repertoire or Subscription Patterns," by B. Sharp, M. Wright, and G. Goodhardt, 2002, *Australasian Marketing Journal, 10*(3), pp. 7–20.

of casual ticket buyer to STH status within a single club, rather than supporting multiple clubs.

Focusing on broader notion of "support" for sport teams, Doyle, Filo, McDonald, and Funk's (2013) research suggested that sport markets behave as repertoire markets. The researchers explored the validity of the double-jeopardy principle in the Australian sport context market in the context of attitudinal loyalty, finding partial support that the principle holds in a sport setting. However, their research was limited to only National Rugby League (NRL) and AFL fans as two broad groups, excluding the remaining two football codes and other sport leagues that compete within the market. This represents a significant limitation, as Wann, Grieve, Zapalac, and Pease (2008) observed, clustering in fans' motivational profiles toward sports that share functional attributes. The sport market may therefore be partitioned into subsegments according to such functional similarities and differences.

Baker et al. (2016) also successfully measured double jeopardy in a sport setting, utilizing STH data to track AFL attendance across the 10 Melbourne-based clubs. Notably, the Dirichlet model was inaccurate at predicting 100% loyalty rates, indicating one potential way that sport markets differ from other kinds. These findings, however, were constrained to attendance within one league and were unable to capture consumer-attendance behavior across the three remaining football codes that compete in the market. Support was also found for the duplication of purchase theory among Australian sport consumers, but once again, this analysis was limited to AFL teams rather than the broader sport market. However, Baker et al. (2016) noted these limitations to be an opportunity to further expand the topic, stating "further replication should be undertaken to establish evidence for double jeopardy patterns … across multiple sports and national borders and in more typical settings" (p. 388). This acknowledgment represents the gap that this research endeavors to address.

From within the identified literature, it becomes apparent that a significant gap exists in the underlying theory developed to understand sport markets. Drawing from a considerable stream of work, researchers have identified and validated the unique characteristics of sport management that distinguish it from other industries. This has perhaps acted as partial justification for the development of sport-specific theories and models to measure sport consumption (Baker et al., 2016). Yet, broader marketing theory has been shown to hold true in many empirical settings (Sharp et al., 2002). Whether broader marketing theories are applicable in a sport management context has significant implications for the research approaches adopted by the discipline going forward.

Methods

Research Context

The study included an evaluation of sport consumer behavior within two highly competitive sport markets located within Australia's two biggest cities, Sydney and Melbourne (Australian Bureau of Statistics [ABS], 2017). Sydney, Australia's most populous city (5.09 million residents) and largest from an economic standpoint (responsible for 24.1% of gross domestic product), represents the primary case and was accordingly allocated a larger sample of consumers ($n = 2{,}039$; ABS, 2018). Melbourne, Australia's second largest city, represents the secondary case ($n = 459$) and provides method replication and a point of case comparison. These two cities represent logical points of comparison, given they are not only similar in size but also in professional sport team concentration. Sydney was chosen as the primary case on the basis that it not only has a greater number of competitors within its market but also has been shaped by a range of physical, historical, and socioeconomic factors that have led to greater competitive intensity (Cashman & Hickie, 1990).

Acknowledging that leagues and teams in the Australian market operate along a fully professional to semiprofessional continuum, the population of the competitive landscape for this study is restricted to leagues that are broadcast in their entirety on free-to-air or subscription television. Within this scope, competing for Sydney residents' attention are 14 top-tier football clubs across four football codes, in addition to a further four professional clubs across the sports of netball, basketball, and cricket. Sydney represents a particularly noteworthy case, given its mix of established and emerging competitors. Rugby Union was Sydney's first football code, with the city founding the country's first governing body in 1874. The sport, however, remained amateur until 1996 when the transnational "Super Rugby" competition established the NSW Waratahs as the sole and apex Rugby club in the region (Horton, 2009). Rugby League can similarly lay claim to first-mover status with the Sydney sport marketplace, being formed as a breakaway Rugby competition in Sydney featuring nine local teams in 1908 (Cashman, 2010). Today, the NRL consists of nine Sydney-based clubs (two of which are inaugural) within a 16-team national competition (Low, 2008).

Soccer and AFL represent newer entrants to the Sydney sporting landscape. The AFL began its expansion into the Sydney market in 1982 as part of a greater strategic push to nationalize the sport (Stewart & Dickson, 2007). In 2012, a second AFL team was created based in Western Sydney, making its first finals appearance in 2016. After a considerable period of poor off-field governance, a new soccer league known as the "A-League" commenced in 2005/2006 featuring eight single-city based, deethnicized clubs (Georgakis & Molloy, 2016; Hay, 2011). Accordingly, the city's two top-tier A-League soccer clubs are comparatively fledgling (5 and 13 years old) and similar to the AFL model, demarcate along an East/West geographic border (Knijnik, 2015). Similarly, three of Sydney's four nonfootball professional teams were established after 2007. Netball's Australian-New Zealand competition (ANZ Championship) was established in 2008, whereas cricket's Big Bash League (BBL), whose two Sydney teams also follow an East/West geographic divide, was formed in 2011 (Cricket Australia, 2011). In 2016, Sydney's 18 teams played in 14 different Sydney stadiums, with the greatest distance between stadiums being 77 km between Brookvale Oval (Northern Sydney) and the Penrith Stadium (Western Sydney). A complete list of clubs is presented in Table 2.

In comparison to Sydney, competition within the Melbourne sport market has been a more recent phenomenon and accordingly the market appears more established (Fujak & Frawley, 2013). Melbourne is the birthplace of AFL, with the first formal set of rules (known as Melbourne Rules) conceived in 1859 and the Victorian Football League established in 1896 (Hess, Nicholson, Stewart, & de Moore, 2008). Nine AFL teams operate out of Melbourne, five of which are inaugural and the remaining four having joined by 1925. Rugby League added their only Melbourne team to the competition in 1998, Soccer's two top flight clubs were founded in 2004 and 2008 while Super Rugby included a local team in 2011. Melbourne's BBL cricket (2011), netball (2008), and basketball (rebranded in 2014) teams were also introduced more recently.

Table 2 List of Sydney Clubs

Clubs	Established	Average Attendance	Facebook Followers[a]
Rugby League: NRL (men's)			
Souths	1908	14,331	430,017
Easts	1908	10,235	211,741
Canterbury	1935	15,202	283,520
Manly	1947	14,431	182,396
Parramatta	1947	13,929	314,526
Penrith	1967	12,818	140,335
Cronulla	1967	14,578	162,636
St. George-Illawarra	1921/1999[b]	13,632	164,216
Wests	1908/1999[b]	15,390	256,066
Australian Rules Football: AFL (men's)			
Sydney Swans	1982	33,425	270,998
GWS Giants	2012	12,333	89,924
Soccer: A-League/W-League			
Sydney FC (men's)	2005	16,071	203,010
Sydney FC (women's)	2008		
Western Sydney (men's)	2012	14,297	103,009
Western Sydney (women's)	2012		
Rugby Union: Super Rugby			
Waratahs	1882/1996[c]	20,280	168,163
Cricket: Big Bash League			
Sydney Sixers (men's)	2011	27,956	897,373
Sydney Sixers (women's)	2015	–	
Sydney Thunder (men's)	2011	19,333	622,386
Sydney Thunder (women's)	2015	–	
Netball: ANZ Championship (women's)			
NSW Swifts	2008	6,540[d]	30,689
Basketball: NBL/WNBL			
Sydney Kings	1988	6,500[d]	43,574
Sydney Uni Flames (women)	2003	–	3,034

Note. NRL = National Rugby League; AFL = Australia Football League; FC = Football Club; ANZ = Australian-New Zealand competition; NBL = National Basketball League; WNBL = Women's National Basketball League.
[a]As on January 30, 2017. [b]Became merged entities in 1999. Premierships based on merged entities. [c]Creation of Super Rugby. Premierships based on Super Rugby. [d]Estimates based on league average.

Participants and Materials

An independent panel provider was commissioned to collect survey responses surrounding sport consumption within the cities of Sydney and Melbourne. In total, 2,572 respondents entered the survey, with 39% screened out for a lack of sport interest, resulting in 1,572 complete surveys. From the remaining 1,572 complete surveys, another 74 were removed accordingly to quality control procedures, leaving a final sample of 1,498. As the primary case, the final Sydney sample size was 1,191 sport consumers, whereas the final Melbourne sample size was 307 sport consumers.

The final sample had a slight male skew (52%), with an average age of 44. Importantly, when compared against the Australian Bureau of Statistics (ABS, 2017) on the basis of statistical local areas, the sample was distributed geographically evenly across both Sydney and Melbourne regions. This is particularly significant from a methodological perspective in the primary case given Sydney's geographic, social, and cultural diversity. North and East Sydney are home to Sydney's wealthier suburbs and residents, characterized by higher incomes and lower unemployment, whereas West and Southwestern Sydney have historically been more working class regions (ABS, 2017).

Participants were recruited by the independent panel provider TEG Rewards to complete an online questionnaire hosted through the Purkle platform. The median complete time of completed surveys was 16 min. The questionnaire contained the following items: First, a combination of screening and demographic questions surrounding respondent age, gender, location, and sport interest were captured. As the Dirichlet framework utilizes unsegmented market level data, such diagnostics were primarily used to ensure the underlying data reflected a representative sample (Ehrenberg et al., 2004). Second, respondents were asked to list the teams they supported. To avoid listing an overwhelming array of teams, survey logic was built in to exclude teams from sports in which respondents reported having no interest. However, an open-ended response was also provided to capture any further teams not listed.

Third, respondents' consumption behaviors were captured for their five favorite teams. Pilot testing indicated that a consumer's

fifth most supported team accounted for only 10% share of spend and thus, appeared an appropriate cutoff point to minimize respondent fatigue (Gray, 2013). However, a supplementary question was also asked at a sport-wide level measuring any other consumption behaviors outside of the top five listed, thus capturing any residual consumption as well as the behaviors of those with no favorite teams.

Although data were captured at a team level, the models are developed at a league level. Often within FMCG industries, individual brands exist under a master brand and significantly, the additive nature of the Dirichlet means that such brand variants may be validly grouped together for analysis (Bound, 2009). In this study, we focused on competing leagues as master brands as it allows for sample pooling, which in turn allows for more robust model predictions. Given the behavioral emphasis of Dirichlet modeling, consumption behavior was measured comprehensively, capturing both spend ($) and frequency via an open-response numeric format. Although this research was focused upon sport attendance and utilized the frequency data, the behaviors measured included attendance (home and away), television viewership, digital streaming, membership, and merchandise. We also captured psychological and attitudinal perceptions of respondents, although such information was superfluous to the requirements of the modeling method, given the study's behavioral focus.

The self-reported nature of consumer behavior data represents a limitation of the study. Although self-reported behavioral data are known to have limitations associated with consumers' ability to accurately recall purchase behaviors, there are few superior alternatives in the absence of propriety panel datasets (Wright, Sharp, & Sharp, 2002). Although the Juster Scale has been proposed as one such alternative, this study utilized self-reported attendance behavior. Given the now 50-year history of Dirichlet modeling, behavioral measures were captured in a manner consistent to previous studies (Bound, 2009). As sport seasons are of a consistent, limited, and fixed supply, and sport attendance is experiential in nature, self-reported data in a sport context may be more accurate than in typical FMCG categories (Wright et al., 2002).

Analysis and Procedure

The analysis was performed using multiple software packages, with SPSS version 23 (IBM Corp., Armonk, NY) as the primary software tool for data preparation and validation. The Dirichlet model was built utilizing the Excel-based software developed by Kearns (2000). An explanation of Dirichlet model input requirements and output interpretation follows.

From few data input and measures, Dirichlet modeling is able to provide theoretical estimates around a number of significant market behavior metrics, which can then be utilized to test generalized marketing principles as outlined in Table 1. Two estimates are required for both the overall category and each brand within the category: the penetration rate and average purchase rate. The penetration rate is a percentage figure calculated as "the number buying the brand [or category] at least once divided by the total number of potential customers" (Ehrenberg et al., 2004, p. 1309). From these estimates, the model is able to derive predicted values (*T*) for seven key brand-level metrics; "% Buying Once," "% Buying 5+," "Purchases Per Buyer of the Brand," "Purchase Per Buyer of the Category," "Share of Category Requirements," "% of Solely Loyal Buyers," and the "Purchase Rate of Solely Loyal Buyers." Comparing observed behavior collected through the survey responses against these theorized predictions allows for interpretation of model fit (Bhattacharya, 1997). Closely predicted values imply a good model fit and a lack of systematic bias in the predictions. Singh and Uncles (2016) note that between-brand correlations (BBCs) for predicted and observed values of between 0.7 and 0.9 represent good model fit. Accordingly, determining if Dirichlet modeling provides accurate estimates of these seven brand-level metrics provides a mechanism to address the principles that underpin RQ1. Specifically in relation to the duplication of purchase law, Dirichlet modeling is also able to provide estimates for the rate of cross-purchasing between brands. This is achieved by deriving a *D* estimate to calculate theorized purchase rates. By doing so, actual cross-purchase rates can be compared with theorized rates to determine whether patterns of preference exist, known as market partitioning (Ehrenberg et al., 2004).

The Dirichlet also provides an *S* parameter for the overall model, a measure of buyer heterogeneity between choice probabilities. The *S* parameter can range from zero to infinity, with an *S* of zero indicating that a buyer makes the same choice each purchase (i.e., 100% of consumers are loyal to one brand, although which brand varies between consumers). Sharp et al. (2002) noted that subscription markets are characterized by *S* parameters of less than 0.2, whereas repertoire markets have *S* parameters almost always greater than 0.8. The *S* parameter therefore provides an efficient measure to address RQ2. If a sport market exhibits an *S* parameter of less than 0.8, its buyers are consuming from within a repertoire of brands in a manner that is complimentary. If a sport market exhibits an *S* parameter of less than 0.2, its buyers are loyal to singular brands, and therefore, outright substitution is more likely to occur.

Results

RQ1: Do Sport Consumer Markets Exhibit Purchase Characteristics Typical of Repeat-Buying Consumer Markets?

To determine whether sport consumer markets contain the characteristics of repeat-buying consumer markets, the NBD Dirichlet model was fitted to the attendance data. Five models were tested and are presented in Table 3. The first four focus upon the Sydney market and includes all seven team sports as a complete sport market, followed by natural subsegments being the football market, winter competitions, and summer competitions. Given that each individual model is derived from common inputs (brand penetration and buying rate), the four model fits are inherently similar. Finally, the complete Melbourne sport market model is presented.

Model consistency across the Sydney and Melbourne sport consumer markets. The Sydney and Melbourne sport markets are underpinned by innately different consumer behavior. A greater proportion of Melbourne residents attend sporting fixtures (44% vs. 35%) and do so in greater annual frequency (10.2 vs. 7.5). Melbourne's apparent stronger desire for sport consumption does not, however, translate into greater variety in preferences. In Melbourne, AFL retains a leading market share (63%) that is 4.5 times larger than its nearest competitor (A-League). By contrast, the NRL retains a Sydney market share (39%) that is only twice that of its next largest competitor (A-League). Melbourne's demonstrative passion for AFL is evident by virtue that 17.21% of the Melbourne population consumes AFL to the exclusion of all other competition leagues.

Table 3 Dirichlet Models

	Brand Share (%)	Penetration (%)		% Buying Once (%)		% Buying Five+ (%)		Brand Purchases		Category Purchases		Share of Category Requirements		100% Loyal %		100% Loyal Rate	
		O	T	O	T	O	T	O	T	O	T	O	T	O	T	O	T
Complete Sydney Sport Market[a]																	
NRL	39	22	23	23	36	38	25	4.8	4.6	8.7	7.6	55	61	31	28	4.8	2.6
A-League	19	12	14	29	43	30	19	4.2	3.7	10.1	8.3	42	44	22	19	5.5	2.0
AFL	18	15	14	30	43	21	18	3.3	3.6	10.1	8.3	33	44	16	19	4.8	2.0
BBL	8	8	7	38	47	14	15	2.5	3.2	10.6	8.8	24	36	11	15	1.9	1.7
Super Rugby	7	7	6	41	47	19	15	2.9	3.2	9.5	8.8	31	36	18	15	2.0	1.7
NBL	6	5	5	39	48	19	14	2.9	3.1	11.8	8.9	24	34	13	14	2.6	1.7
ANZ Championship	3	2	2	40	50	12	13	2.6	2.9	11.0	9.1	24	32	12	14	2.3	1.6
Sydney Football Market[b]																	
NRL	47	22	22	23	36	37	29	4.8	4.6	7.5	8.2	64	56	39	39	4.9	3.3
A-League	23	12	14	31	43	29	23	4.2	3.7	8.7	9.2	49	40	27	26	5.4	2.4
AFL	21	15	13	31	43	19	22	3.3	3.6	8.1	9.3	41	39	27	25	4.5	2.4
Super Rugby	9	7	6	43	48	18	19	2.9	3.2	8.1	10.0	36	32	21	21	2.4	2.1
Sydney Winter Competitions[c]																	
NRL	58	22	23	23	36	37	29	4.8	4.6	6.5	6.8	74	67	50	50	4.7	3.8
AFL	27	15	13	31	43	19	22	3.3	3.6	6.9	7.8	48	47	31	31	3.9	2.7
Super Rugby	11	7	6	43	47	18	19	2.9	3.2	7.3	8.4	40	38	24	24	2.9	2.3
ANZ Championship	4	2	2	35	50	14	17	2.6	3.0	8.1	8.8	32	34	16	16	2.1	2.1
Sydney Summer Competitions[d]																	
A-League	59	12	14	31	40	29	24	4.2	3.7	5.2	4.8	80	76	65	65	4.5	3.4
BBL	24	8	6	38	46	13	19	2.5	3.1	4.4	5.4	57	57	56	56	2.6	2.8
NBL	17	5	45	38	48	20	18	2.9	3.0	5.2	5.6	55	54	38	38	2.6	2.6
Complete Melbourne Sport Market[e]																	
AFL	63	39	39	30	26	54	39	7.3	7.3	10.6	9.2	69	79	44	33	6.9	3.0
A-League	14	14	19	29	43	32	18	4.7	3.6	15.6	12.1	33	30	13	10	5.5	1.4
BBL	9	13	13	39	47	21	14	3.0	3.1	15.8	12.8	19	25	3	8	2.0	1.3
NRL	6	8	10	24	49	21	13	3.3	2.9	16.5	13.0	20	23	7	8	2.0	1.3
NBL	4	7	7	41	51	18	12	3.0	2.8	17.3	13.3	18	21	7	7	1.0	1.3
ANZ Championship	2	4	4	40	52	12	11	2.5	2.7	14.6	13.5	17	20	3	7	0.0	1.2
Super Rugby	1	3	3	41	53	5	10	2.2	2.6	13.4	13.6	16	19	0	7	2.0	1.2

Note. AFL = Australia Football League; BBL = Big Bash League; NRL = National Rugby League; NBL = National Basketball League.

[a]Penetration of category = 34.6%, rate of category buying = 7.5, $S = 1.8$. [b]Penetration of category = 32.8%, rate of category buying = 6.7, $S = 1.3$. [c]Penetration of category = 29.9%, rate of category buying = 5.9, $S = 1.1$. [d]Penetration of category = 19.2%, rate of category buying = 4.4, $S = 0.6$. [e]Penetration of category = 43.8%, rate of category buying = 10.2, $S = 3.9$.

Despite innately different structures, both the Sydney and the Melbourne sport consumer markets appear to behave in largely predictable patterns that the NBD Dirichlet model is robust toward modeling. In respect to elements of the model, which are less predictive, patterns of behavior within the Sydney and Melbourne models nonetheless remain consistent. This is significant as it may be concluded that both markets conform to a consistent underlying structure. Model interpretation, however, needs to be considered in conjunction with sample size, as Sydney benefits from a larger sample compared with Melbourne ($n = 2{,}039,\ 459$). The eight predicted values derived by the Dirichlet cascade from utilizing a base of all sport attendees to derive brand penetration ($n = 1{,}119,\ 201$), to then sport-specific base sizes for the remaining seven predicted values. The smallest individual sport-specific sample size in Sydney was 49 (ANZ Championship), compared with 14 in Melbourne (Super Rugby).

Both Sydney and Melbourne models provide highly accurate estimates of league level penetration. The BBC for penetration values with the Sydney and Melbourne models was .99 and .98, respectively. In respect to the % Buying, both models show a similar trend of over prediction of consumers who purchase once and under prediction of those who purchase on five plus occasions and correspondingly still yet a strong BBC value. The BBC for the Sydney model for % Buying Once and Five+ was .96 and .93, respectively. The corresponding values in the Melbourne were .48 and .95. The Melbourne model suffered from an anomaly in respect to the NRL value, likely influenced by limited sample in the secondary case. Each market model also provided accurate predictions for the purchase rate per buyer, with a BBC of .93 and .96 in Sydney and Melbourne, respectively.

The models underpredicted the category purchase rate of consumers (i.e., the sum all league attendance), although the model did so in a consistent manner across brands and models (BBC = .77, .72). The share of category requirements percentages is calculated by dividing the two aforementioned purchases per buyer metrics. Correspondingly, their predictive power is relational to the aforementioned values. Finally, the model provided relatively accurate predictions for the proportion of solely loyal consumers (BBC = .92, .98), although their rate of consumption was consistently underpredicted. The model was perhaps least predictive of the rate of buying among 100% loyal fans of the larger brands within each model.

Differences in market share are largely due to differences in penetration. Table 3 demonstrates strong support for Principle 1. Six of the seven leagues conformed to the proposed pattern between market share and penetration. In this respect, A-League in the Sydney model appears to be the only confounding league, with an average purchase rate among buyers 14% above the predicted value. Correspondingly, the A-League records a higher market share than the AFL despite a smaller penetration. One potential explanation for this deviation may relate to the semi-fixed supply of sport matches, a trait that appears relatively unique to sport (Smith & Stewart, 2010). In a sport setting, supply deviates between leagues based on season structure. Between the A-League's two Sydney teams, a total of 43 matches were played locally (within NSW) during the 2015/2016 season across preseason, domestic, and continental championships. In contrast, the AFL's two Sydney teams competed locally 29 times across preseason and premiership fixtures.

The relationship between market share and penetration is further illustrated visually within Figure 1. The relationship between penetration and market share follows a linear pattern and accordingly exhibits Pearson correlations of .97 and .99 in the Sydney and Melbourne markets, respectively. A standard regression upon the Sydney market yields an unstandardized coefficient (β) of 1.792 for penetration upon market share ($t = 8.37$, $p < .001$). Therefore, a 1% increase in consumer penetration can be expected to yield a 1.8% increase in market share in the Sydney sport attendance market.

Double jeopardy. The results support Principle 2, presented in Table 3. This is most apparent at the extremes of each market.

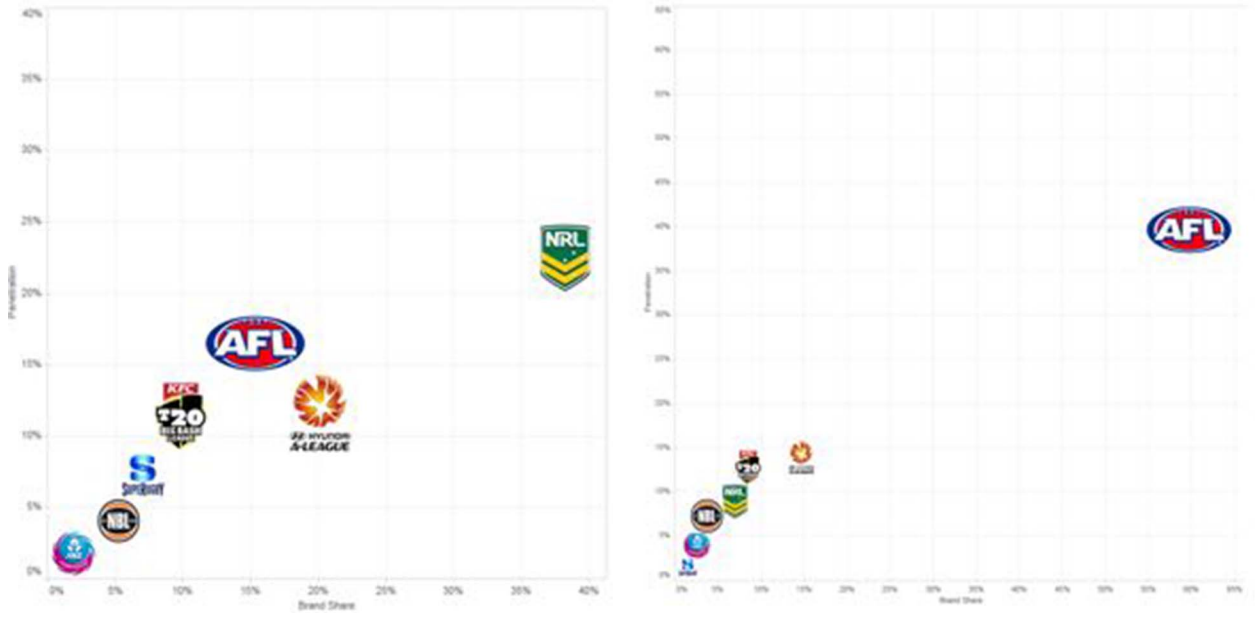

Figure 1 — Sydney (left) and Melbourne (right) sport market: scatter-plot relationship between brand share and penetration rate. AFL = Australia Football League; NRL = National Rugby League; BBL = Big Bash League.

The Sydney market leader NRL has an average purchase rate 84% larger than the smallest share brand (4.8 vs. 2.6). Melbourne market leader AFL has an average purchase rate 230% larger than the smallest share brand (7.3 vs. 2.2). The relationship between market share and purchase rate returns a Pearson correlation of .94 in Sydney and .96 in Melbourne. Overall, the models provide accurate predictions for purchases-per-buyer of the brand, with the coefficient of variation between the predicted and observed purchase rate equating to 11.4% and 12.8% of the observed mean in the Sydney and Melbourne models, respectively.

Customers buy from a repertoire of brands. Table 3 provides overall support toward Principle 3. In the complete models, the NRL is the only code that supplies its customers with more than half their category requirements in Sydney (55%), whereas the AFL behaves similarly in Melbourne (69%). Within the summer subsegment of the sport market, each of the three competing leagues provide more than half of consumer category requirements, thus violating Principle 3. This, however, is a reflection of the small number of competitors competing within this subsegment.

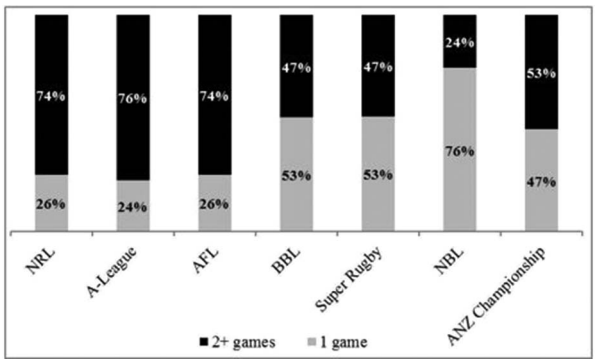

Figure 2 — Sydney attendance rate of solely loyal buyers by league. NRL = National Rugby League; AFL = Australia Football League; BBL = Big Bash League.

Solely loyal buying is relatively rare. The Dirichlet model provides accurate predictions for the rate of loyal buying in the Sydney models, particularly within the football market, supporting Principle 4. In the case of Rugby League, 39% of the league's fan base exclusively attends NRL fixtures, with Super Rugby holding the smallest share of loyal fans at 21%. Solely loyal buying metrics cannot be interpreted from within the Melbourne model as there are only a cumulative 15 solely loyal buyers within the sample among the remaining six competitors below the AFL. The generalization that solely loyal buyers are lighter buyers of the overall category holds within a football attendance context, although the model's predicted values are considerably lower than the observed values.

Among NRL, AFL, and A-League consumers, solely loyal buyers purchase half as much as nonsolely loyal buyers in total. This finding in itself is by no means surprising, given that solely loyal consumers include those who have only bought the entire product category once. Of perhaps greater interest is the apparent dichotomy in the solely loyal attendance distribution between big and small market share leagues (see Figure 2). The market's three largest leagues hold similar ratios between solely loyal single attendees and multiple match attendees, with approximately one quarter of consumers attending only a single match. In contrast, the four smaller leagues suffer from a greater proportion of single-attendance customers (over 50%). It should be noted, however, that these small leagues suffer from a small sample size within this study (average sample size of 16).

Duplication of purchase law. To test for duplication of purchase within the category (Principle 5), Table 4 provides a cross-tabulation of cross-attendance among the seven major sport leagues in Sydney. Sport leagues are positioned within the table in descending order according to observed brand penetration.

Table 4 Duplication of Sport Attendance

	Percentage Who Also Bought							
Buyers of	**NRL (%)**	**AFL (%)**	**AL (%)**	**BBL (%)**	**SR (%)**	**NBL (%)**	**ANZ (%)**	**Average Duplication (%)**
NRL		39	33	22	19	13	5	22
D estimate (2.2)		31	26	17	15	10	5	18
AFL	58		36	30	23	20	8	29
D estimate (2.9)	63		35	23	20	14	7	27
AL	58	44		23	17	17	3	27
D estimate (2.7)	58	39		22	19	13	6	26
BBL	58	54	34		26	16	11	33
D estimate (3.3)	71	48	40		23	15	8	34
SR	58	48	29	30		11	7	31
D estimate (3.1)	66	45	37	25		14	7	32
NBL	58	63	45	28	17		7	36
D estimate (3.6)	79	53	44	29	25		9	40
ANZ Championship	47	51	16	20	37	14		31
D estimate (3.1)	67	45	38	25	21	14		35
Penetration	22	15	12	8	7	5	2	10

Note. *D* estimates represent the predicted rate of duplication of purchase, calculated by multiplying observed average duplication against competitor penetration. NRL = National Rugby League; AFL = Australia Football League; BBL = Big Bash League; SR = Super Rugby; AL = A-League; NBL = National Basketball League.

Accordingly, for a duplication of purchase pattern to be evident within the market, one would expect the highest purchase rates at the leftmost side of the table, diminishing in a rightward order. With a penetration rate of only 2.4%, resulting in a sample of 49 attendees, the ANZ Netball Championship has been included within the bottom row of Table 4 for completeness rather than analysis.

Both Table 4 and corresponding correlational analysis provide strong support for the duplication of purchase law within a sport attendance context. Given that the ranked order of penetration and average duplication are perfectly aligned, the nonparametric Spearman correlation provides a perfect correlation of 1.0. The corresponding Pearson correlation returns a correlation value of .97. Notably, the *D* estimates of duplication provide highly accurate predictors for the observed data. With the exception of NRL buyers (and disregarding the small sample of ANZ Netball Championship buyers), the predicted duplication falls within 1% or 2% of the observed data. In the case of NRL buyers, although the *D* estimate underpredicts observed data, it does so at a consistent rate of 20% under prediction for Brands 2–6.

Table 5 tests for partitioning within the Sydney sport attendance market. Markets in which brands are directly substitutable will not show evidence of special clustering, known as *partitioning* (Ehrenberg et al., 2004). However, markets with functional subcategories may attract a segmented consumer group, resulting in the clustering of similar brands and deviation away from predicted *D* estimates. As displayed in Table 3, the overarching sport market can be potentially distinguished into several subcategories, notably by season (winter vs. summer) and additionally by sport type (football vs. nonfootball), and as such, these categories made for logical partitions to evaluate.

Table 5 does not suggest a segment-level partitioning trend exists within either the sport type of season markets, however. For true partitioning to be evident, there must be a consistent pattern of over- or underpurchase within and between partitions. Notably, however, the consistent underconsumption of NRL games by each of the remaining six codes suggests a form of partition between the NRL as a market leader and the remaining six leagues. Conversely, the AFL is overconsumed among supporters of other leagues relative to predicted values. Perhaps, most surprising is that there does not appear to be any particular partitioning between the NRL and the Super Rugby competitions, despite being variant forms of the same underlying sport (rugby) and therefore the most similar in nature.

Table 5 Testing for Market Partitioning Among Attendees

Partitioning Based on Sport Type

	Football				Nonfootball		
	NRL (%)	AFL (%)	AL (%)	SR (%)	BBL (%)	NBL (%)	ANZ (%)
Football							
NRL		+7	+7	+4	+4	+2	0
AFL	−5		+1	+2	+6	+7	+1
AL	0	+4		−2	+1	+5	−3
SR	−8	+3	−8		+6	−3	0
Nonfootball							
BBL	−14	+5	−6	+3		+1	+3
NBL	−21	+10	+1	−8	−1		−1
ANZ	−20	+6	−21	+15	−5	0	

Partitioning Based on Season

	Winter				Summer		
	NRL (%)	AFL (%)	SR (%)	ANZ (%)	AL (%)	BBL (%)	NBL (%)
Winter							
NRL		+7	+4	0	+7	+4	+2
AFL	−5		+2	+1	+1	+6	+7
SR	−8	+3		0	−8	+6	−3
ANZ	−20	+6	+15		−21	−5	0
Summer							
AL	0	+4	−2	−3		+1	+5
BBL	−14	+5	+3	+3	−6		+1
NBL	−21	+10	−8	−1	+1	−1	

Note. NRL = National Rugby League; AFL = Australia Football League; BBL = Big Bash League; SR = Super Rugby; AL = A-League; NBL = National Basketball League.

RQ2: Do Consumers Treat Sporting Teams as Complimentary or Substitutable Goods?

Sharp et al. (2002) refer to three components by which to determine whether a market behaves as a repertoire (complimentary) or subscription (substitutable) market. First, subscription markets violate Principles 2, 3, and 4 of typical of repeat-buying consumer markets as previously outlined (see Table 1). Second, it is common to expect rates of solely loyal buying to exceed 70% within subscription markets. Finally, the Dirichlet model's *S* parameter provides a definitive metric by which to assess the market structure. Subscription markets typically hold an *S* parameter value of less than 0.2. These criteria are now applied against the sport attendance market data.

Subscription markets violate Principles 2, 3, and 4 of typical repeat-buying consumer markets. Results pertaining to RQ1 confirmed that each of the three principles (and the five overall) hold true within the sport attendance market. Two particular characteristics of a typical subscription market that were not evident within the model, as seen in Table 2, relate to the rate of loyal buyers (Principle 3) and the share of category requirements each brand provides (Principle 4).

It is common to expect rates of solely loyal buying to exceed 70% within subscription markets. In the complete Sydney model, market leader NRL achieved the highest rate of loyalty (31%), while the seven brands held a collective average of 18%. Although sample size prohibits valid interpretation of the metric in the Melbourne market, market leader AFL recorded a rate of loyal buying rate of 44% ($n = 79$), also far below the expectations of a subscription market. Furthermore, individual brands should provide a significant majority of consumers spend/usage, commonly exceeding 60–70% of customer category requirements (Sharp et al., 2002). Within the complete Sydney model, the NRL recorded the highest share (55%), while the market averages 33%. In the Melbourne model, the AFL is able to secure a high share (69%), although this is not replicated across the market (average 27%).

The estimate of the Dirichlet model's S parameter. Sharp et al. (2002) noted that subscription markets are characterized by *S* parameters of less than 0.2, while repertoire markets have *S* parameters almost always greater than 0.8. The complete Sydney market resulted in an *S* parameter of 1.8, while the complete

Melbourne market model resulted in an *S* parameter of 3.9. The smallest *S* parameter was 0.6, being the Sydney summer model. Brands within this model also had higher rates of solely loyal consumers and share of category requirements; however, this is expected in a model that features only three competitors. Upon interpreting the results across the three components in respect to the sport attendance market, it appears conclusive that consumers treat sport teams as complimentary/repertoire goods.

Discussion

The core research aim of the study was to develop a theoretical understanding of consumption within competitive sport markets. This was underpinned by two RQs, by which the results and discussion have been demarcated.

Research Question 1

This study has provided evidence that the sport attendance market exhibits the purchasing characteristics of repeat-buying consumer markets. All five proposed marketing generalizations hold with the sport attendance markets tested, each with implications for sport marketing theory and practice.

Loyalty and solely loyal buying. A significant amount of the literature in sport management has placed an emphasis on identifying the unique elements that differentiate sport as an industry. Of particular, emphasis is further understanding the sport fan who is perceived to have an irrational commitment to his or her team that is unmatched within other consumer products categories (Smith & Stewart, 2010). Yet, despite this common held belief, the Dirichlet model provides robust predictions for the rate of solely loyal buying within the sport attendance market. Accordingly, the rate of loyal buying within this market does not differ significantly from many previous validated consumer good product lines that do not claim to have irrationally loyal customers (Sharp et al., 2002).

The use of the Dirichlet model to evaluate "loyalty" in sport markets is novel, as it utilizes distinct measures of loyalty compared with many preexisting definitions in both a sport and a broader management context (Dawes, 2016; Funk & James, 2001). Importantly, the Dirichlet model does not presuppose a connection between commitment and loyalty, nor does it require exclusive consumption (Bassi, 2011; Ehrenberg et al., 2004). Loyalty within the Dirichlet framework is therefore, in part, measured by the share of category requirements provided by the brand, as this translates directly to sales revenue and therefore profits (Dawes, 2016). This represents a critical theoretical distinction from many sport fandom models. Mullin et al.'s (2014) escalator model, for instance, is premised by a pattern in which people increase their consumption and loyalty in a collinear fashion as they escalate up the fandom model. Yet, Figure 2 illustrates that sole loyalty is not a precondition to high customer value, as this group encompasses a component of consumers who are, in fact, very small brand and category consumers. Therefore, within an escalator model, the most behaviorally loyal (solely) consumers exist at both the low- and high-value ends of the escalator. Here, an interesting hypocrisy emerges: Although sole loyalty is an intuitive indicator of strong support for a specific team/league, solely loyal consumers are lesser consumers of the overall sport category (than nonloyals). In fact, nonsolely loyal consumers are more sport-orientated overall, yet their desire to consume sport diversely can result in their categorization into negatively toned typologies such as the "flaneur" who is "more likely to be bourgeois and thus in pursuit of a multiplicity of football experiences" (Giulianotti, 2002, p. 39).

The relationship between market share and penetration. The relationship between penetration and market share is particularly significant in a sport setting, as the sport attendance market poses particular structural constraints upon the practitioner who aspires to increase his or her team's attendance penetration. Specifically, unlike typical repeat-purchase contexts, such as those in FMCG, the sport attendance product is tied to a physical location and cannot be freely distributed. Therefore, the physical location of stadiums and the size of major metropolitan cities are likely to be strong additional influences that shape consumer propensity to attend, which in turn will impact penetration.

The Sydney case provides a compelling empirical example of both the aforementioned challenge and the corresponding benefits of adopting a multiteam market-expansion strategy. Within both the Sydney and the Melbourne markets, league penetration neatly aligns with the number of respective clubs. Focusing upon Sydney, Rugby League has nine Sydney-based clubs and is correspondingly able to draw deeply from emotional attachments to physical place (Low, 2008). The next three largest leagues by penetration (AFL, A-League, and BBL) have all adopted dual-team expansion strategies that have attempted to leverage tribalism along Sydney's East/West geographic and social divide (Knijnik, 2015). Conversely, the three smallest leagues by penetration (Super Rugby, National Basketball League (NBL), and ANZ Championship) each had just a single team within the Sydney market at the time of the study.

The relevance of penetration in shaping competitive sport markets emerges in several specific management case studies here. First is Rugby Union, which via the advent of Super Rugby in 1995 adopted the North American "one team, one city" model of sport league franchising (Horton, 2009). Therefore, despite the first mover advantage of being the first football code established in Sydney, the code has only one top-level club within its heartland market (Cashman, 2010). This has limited the geographic accessibility of the sport, resulting in penetration and market share that lags behind less established competitors. Next is football, which similarly adopted a one team, one city model when relaunching the A-League competition in 2005 (Hay, 2011). In initially conforming to this policy, the league expanded its competition with teams from regional centers, all of which would fail by 2012. Critics have suggested that had the A-League adopted two Sydney-based footballs teams from inception, the league would be in a much healthier position today (Georgakis & Molloy, 2016). Last is netball, which in 2017 launched a new rebranded Super Netball competition, which now features two Sydney-based clubs. However, unlike the A-League, BBL, and AFL, who clearly delineate their respective two teams' geographical catchment, the two Sydney-based netball teams play from the same Western Sydney-based venue and offer little such delineation. Therefore, it remains highly questionable whether the addition of this new team will successfully improve the penetration of the sport in the absence of geographic diversification.

Confirmation of double jeopardy and duplication of purchase law. This study provides further confirmation of the existence of the double-jeopardy pattern of market share first proposed by McPhee (1963) within sport attendance markets. This study represents the most complete confirmation of the phenomena within the sport industry to date, thus improving the generalizability of previous studies. The first such study by Doyle et al. (2013) explored attitudinal loyalty, but did so for only two sport leagues,

an incomplete set of competing brands. Baker et al. (2016) further observed a strong double-jeopardy pattern in membership attendance data for Melbourne-based AFL clubs, but this result was limited by nature to attendance of teams within one league. This study not only captured a more complete competitive set, but did so across two markets.

Although the study also showed strong support for the duplication of purchase law, perhaps the more significant finding relates to the lack of partitioning within the market. Departure from predicted rates of duplication of purchase often indicates that a market is comprised of partitions in which brands share particular functional similarities. In such instances, there is a coherent structure to a broad product category with subtypes competing more intensely with each other (Dawes, 2016). This has been shown to be the case in numerous product categories such as gasoline (unleaded vs. leaded) and the automobile market (e.g., premium vs. sport; Ehrenberg et al., 2004). One could expect the four football codes to constitute such a partition within the overarching sports market; however, the data did not support this expectation, which has significant implications for sport practitioners in terms of understanding competitive sport landscapes. Football administrators, for instance, who may view other football codes as more direct competitors, must also concern themselves with the performance of nonfootball leagues as fellow market participants, given that all leagues appear to compete as one nonpartitioned competitive set.

The absence of duplication is perhaps most surprising when evaluating the cross-attendance between Rugby League and Rugby Union, which given that the former is derived from the latter, represent the most functionally similar sports. Research into the motivational profile of fans across sports suggests that fans of aggressive sports share significantly different motivations from fans of nonaggressive sports (Wann et al., 2008). Therefore, one could expect the shared motivational drivers of aggressive sports to coincide with greater cross-attendance in similar such leagues. Conversely, given that the two rugby codes have diametric social and cultural identities, in which the divide "assumes a class basis, with rugby league fixtures being heavily supported by the working class" (Horton, 2009, p. 969), one might expect a suppression of cross-attendance despite obvious functional similarities. The duplication rates illustrated in Tables 3 and 4, however, do not provide compelling support for either the functional (increased cross-attendance) or sociological (decreased cross-attendance) proposition.

Research Question 2

This study has provided evidence that sport attendance is a repertoire market and therefore consumers treat sport team attendance as complimentary goods. This determination is consistent with existing literatures, although it significantly expands the application of the theory. Baker et al. (2016), for example, reached a similar conclusion; however, their study focused solely on AFL members and therefore focused on a subsegment of attendees and only measured cross-attendance within a single sport—a limitation noted by the authors. Moreover, in performing a segmentation of football supporters, Tapp and Clowes (2002) developed a segment titled "repertoire fans" that attended matches not involving their team and this group accounted for a quarter of the sample. This study represents a significant advancement on such findings, as the first to examine a sports market in its entirety, being across multiple sports and measuring the behavior of an entire market.

A further significance of Dirichlet loyalty measurement is that it does so at a market level (macro), adding multidimensionality missing in existing team-level segmentation models. Within Funk and James's (2001) psychological continuum model, it is proposed that the most advanced "allegiant" fans display behavioral loyalty through a biased behavioral response with respect to one or more alternative brands in a set of brands, resulting in repeat purchasing over time. This biased behavioral response therefore requires the preclusion of other brands (Funk & James, 2006). Yet, consumers within repertoire markets are capable of exhibiting polygamous loyalty to several brands (Sharp et al., 2002). Therefore, although sport team practitioners should strive to develop a fan base that is "allegiant," such a strong psychological connection would not necessarily equate to a fan base that is solely loyal to the team in question.

From a practitioner's perspective, repertoire and subscription markets require distinct marketing strategies. Furthermore, Dirichlet modeling allows practitioners to develop realistic data-driven performance benchmarks to develop and measure such strategies (Bassi, 2011). The repertoire nature of the sport attendance market has implications for the expectations practitioners should set in attempting to capture solely loyal consumers. The modeling accurately predicted rates of solely loyal buying ranging between 14% and 28% in the Sydney market, far below the rates typically seen in subscription markets (Sharp et al., 2002). Thus, evidently, the vast majority of a sport league's customers are in fact shared. This conforms to Ehrenberg's (1971) important observation that customers are really other people's customers who occasionally buy from you. As repertoire market brands share their customers with other brands, a greater emphasis must be placed on increasing penetration and share of category requirements (Ehrenberg et al., 2004).

From an academic viewpoint, the repertoire market nature of sport attendance has significant theoretical and practical implications. Theoretically, the model supported all five marketing theory principals, indicating that sport markets are relatively typical of repeat-buying consumer markets. Although this does not contradict the existence of sport markets' "unique" features, it may diminish their significance. The fit of the model suggests that mainstream business approaches may have greater application within a sport business context, which in turn has implications for the legitimacy of sport management as a distinct field of research (Baker et al., 2016). This, however, also provides opportunities for scholars to apply previously untested methods and principles in a sport setting, creating a plethora of opportunities for future research.

Conclusion

The researchers endeavored to quantify the consumer structure of sport markets. To do so, a highly generalizable and parsimonious model called the Dirichlet was tested upon sport attendance to determine whether the market behaved characteristically of other repeat-purchase goods. Significantly, this research represents the most substantive attempt yet at performing such a market level analysis in a sport setting, advancing upon previous attempts in two respects. First, the study provided a multimarket comparative analysis. Here, the Australian cities of Sydney and Melbourne were chosen as the markets of analysis, owing to the presence of numerous competitors creating crowded sport markets (Fujak & Frawley, 2013). Second, the study more comprehensively captured the behavior of consumers than previously attempted, with consumption data measured across Australia's seven largest professional sport leagues.

Five generalized marketing principles were tested and shown to remain valid in a sport setting, confirming that although the sport industry may contain unique characteristics, these do not result in consumer behavior that is distinct from many other repeat-purchase goods. This finding represents a significant contribution to the field given the ongoing contention surrounding the positioning of sport management as a stand-alone discipline (Baker et al., 2016; Chalip, 2006). In confirming that sport consumers behave in predictable patterns replicated in many other industries, the research runs counter to much of the field's foundational research and instead contributes to a growing body of work, which is eroding the basis by which the sport product can be justified as unique (Baker et al., 2016; Smith & Stewart, 2010). Although this has considerable implications for the positioning of sport marketing and management as specialized disciplines, it also facilitates opportunities for future research to further apply business principles from nonsport contexts that are yet to be considered within the discipline. This represents a further contribution, given the findings contribute to remedying the scarcity of strategy-related research in competitive sport settings (Shilbury, 2012). One such area deserving further strategic exploration is the choice between prioritizing consumer frequency (increasing existing fan consumption) or penetration (creating new fans). The field of Dirichlet modeling espouses the prioritization of penetration to increase market share and profitability (Ehrenberg et al., 2004), while sport theories of escalating commitment favor developing fan commitment to increase consumption frequency (James et al., 2002; Mullin et al., 1993).

Within the five generalized marketing principles analyzed, this study also confirmed that consumers attend sport matches within a repertoire-purchase pattern and therefore treat sport teams as complimentary products. This determination is theoretically significant as it is perhaps the most fundamental behavioral characteristic of repeat-purchase consumer markets yet has been rarely investigated in a sport market setting. Although competition may be at the "heart and soul of sport management" (Shilbury, 2012, p. 2), sharing is in fact what characterizes sport consumer markets. Rather than considering sport consumers to be disloyal, this finding necessitates a fundamental shift in the interpretation of sport fan behavior away from a dichotomous view of loyalty toward a polygamous one (Sharp et al., 2002). From a practitioner perspective, recognition of the fundamental structure of the market may also require an adjustment in expectations, objectives, and strategy development.

Despite the advancements to theory and practice offered within this research, it is not without limitations. Given sample size restrictions, models were aggregated to league-level master brands. Although this is methodologically valid (Bound, 2009), further research is warranted at a team level across multiple sports. In addition, the sport market encompasses many product categories, and the research has focused upon attendance. In particular, although attendance and STH markets have now received attention, an opportunity exists for further research in respect to merchandise and television consumption market behavior.

References

Australian Bureau of Statistics. (2017, April). Census 2016. Retrieved from http://www.abs.gov.au/census

Australian Bureau of Statistics. (2018, June). 5206.0 Australian National Accounts: National Income, Expenditure and Product, Mar 2018. Retrieved from http://www.abs.gov.au/ausstats/abs@.nsf/mf/5206.0

Baker, B., McDonald, H., & Funk, D.C. (2016). The uniqueness of sport: Testing against marketing's empirical laws. *Sport Management Review, 19*, 378–390. doi:10.1016/j.smr.2016.02.002

Bassi, F. (2011). The Dirichlet model: Analysis of a market and comparison of estimation procedures. *Marketing Bulletin, 22*, 1–11. Retrieved from http://marketing-bulletin.massey.ac.nz/

Bhattacharya, C. (1997). Is your brand's loyalty too much, too little, or just right? Explaining deviations in loyalty from the Dirichlet norm. *International Journal of Research in Marketing, 14*(5), 421–435. doi:10.1016/S0167-8116(97)00024-4

Bound, J. (2009). Users guide to Dirichlet. *Marketing Bulletin, 20*, 1–20. Retrieved from http://marketing-bulletin.massey.ac.nz/

Byon, K.K., Zhang, J.J., & Connaughton, D.P. (2010). Dimensions of general market demand associated with professional team sports: Development of a scale. *Sport Management Review, 13*, 142–157. doi:10.1016/j.smr.2009.07.005

Cashman, R. (2010). *Paradise of sport* (2nd ed.). Petersham, AU: Walla Walla Press.

Cashman, R., & Hickie, T. (1990). The divergent sporting cultures of Sydney and Melbourne. *Sporting Traditions, 7*(1), 26–46.

Chalip, L. (2006). Toward a distinctive sport management discipline. *Journal of Sport Management, 20*(1), 1–21. doi:10.1123/jsm.20.1.1

Chen, F. (2008, February). The Dirichlet package. Retrieved from http://cran.r-project.org/src/contrib/Archive/dirichlet

Costa, C.A. (2005). The status and future of sport management: A Delphi study. *Journal of Sport Management, 19*(2), 117–142. doi:10.1123/jsm.19.2.117

Cricket Australia. (2011). *Annual report 2010–2011*. Melbourne, Australia: Author.

Dawes, J.G. (2016). Brand growth in packaged goods markets: Ten cases with common patterns. *Journal of Consumer Behaviour, 15*, 475–489. doi:10.1002/cb.1595

Doyle, J., Filo, K., McDonald, H., & Funk, D.C. (2013). Exploring sport brand double jeopardy: The link between team market share and attitudinal loyalty. *Sport Management Review, 16*, 285–297. doi:10.1016/j.smr.2012.11.001

Ehrenberg, A. (1971). *Repeat-buying*. London, UK: Edward Arnold.

Ehrenberg, A. (2000). Repeat buying. *Journal of Empirical Generalisations in Marketing Science, 5*(2). Retrieved from https://www.empgens.com/

Ehrenberg, A., Goodhardt, G., & Barwise, P. (1990). Double jeopardy revisited. *Journal of Marketing, 54*, 82–91. doi:10.2307/1251818

Ehrenberg, A., Uncles, M., & Goodhardt, G. (2004). Understanding brand performance measures: Using Dirichlet benchmarks. *Journal of Business Research, 57*, 1307–1325. doi:10.1016/j.jbusres.2002.11.001

Field, R. (2006). The ties that bind: A 2003 case study of Toronto's sport elite and the operation of commercial sport. *International Review for the Sociology of Sport, 41*(1), 29–58. doi:10.1177/1012690206073215

Fujak, H., & Frawley, S. (2013). The barassi line: Quantifying Australia's greatest sporting divide. *Sporting Traditions, 30*(2), 93–109.

Funk, D.C., Alexandris, K., & McDonald, H. (2016). *Sport consumer behaviour: Marketing strategies*. London, UK: Routledge.

Funk, D.C., & James, J. (2001). The psychological continuum model: A conceptual framework for understanding an individual's psychological connection to sport. *Sport Management Review, 4*, 119–150. doi:10.1016/S1441-3523(01)70072-1

Funk, D.C., & James, J. (2006). Consumer loyalty: The meaning of attachment in the development of sport team allegiance. *Journal of Sport Management, 20*, 189–217. doi:10.1123/jsm.20.2.189

Georgakis, S., & Molloy, S. (2016). From old soccer to new football? Expert accounts of transformations on the world game in Australia post-crawford report. *Soccer & Society, 17*, 72–89. doi:10.1080/14660970.2014.919270

Giulianotti, R. (2002). Supporters, followers, fans, and flaneurs: A taxonomy of spectator identities in football. *Journal of Sport & Social Issues, 26*, 25–46. doi:10.1177/0193723502261003

Gladden, J., & Funk, D.C. (2001). Understanding brand loyalty in professional sport: Examining the link between brand associations and brand loyalty. *International Journal of Sports Marketing and Sponsorship, 3*, 54–81. doi:10.1108/IJSMS-03-01-2001-B006

Goodhardt, G., Ehrenberg, A., & Chatfield, C. (1984). The Dirichlet: A comprehensive model of buying behaviour. *Journal of the Royal Statistical Society*. Series A (General), *147*, 621–655. doi:10.2307/2981696

Gray, D.E. (2013). *Doing research in the real world*. Thousand Oak, CA: Sage.

Hay, R. (2011). Ethnicity, structure and globalization: An argument about association football in Australia, 1958–2010. *Sport in Society, 14*, 833–850. doi:10.1080/17430437.2011.587299

Hess, R., Nicholson, M., Stewart, B., & de Moore, G. (2008). *A national game: The history of Australian rules football*. Melbourne: Penguin.

Horton, P. (2009). Rugby union football in Australian society: An unintended consequence of intended actions 1. *Sport in Society, 12*, 967–985. doi:10.1080/17430430903053216

James, J.D., Kolbe, R.H., & Trail, G.T. (2002). Psychological connection to a new sport team: Building or maintaining the consumer base? *Sport Marketing Quarterly, 11*, 215–226. Retrieved from http://fitpublishing.com/journals/smq

Kearns, Z. (2000). *Dirichlet no solver software*. Palmerston North, NZ: Massey University.

Knijnik, J. (2015). Feeling at home: An autoethnographic account of an immigrant football fan in Western Sydney. *Leisure Studies, 34*, 34–41. doi:10.1080/02614367.2014.939991

Low, J. (2008). *Centenary reflections: 100 years of rugby league in Australia*. Melbourne, Australia: Australian Society of Sports History.

Mahony, D.F., Madrigal, R., & Howard, D. (2000). Using the psychological commitment to team (PCT) scale to segment sport consumers based on loyalty. *Sport Marketing Quarterly, 9*, 15–25. Retrieved from http://fitpublishing.com/journals/smq

McDonald, H. (2010). The factors influencing churn rates among season ticket holders: An empirical analysis. *Journal of Sport Management, 24*, 676–701. doi:10.1123/jsm.24.6.676

McDonald, H., Karg, A., & Lock, D. (2010). Leveraging fans' global football allegiances to build domestic league support. *Asia Pacific Journal of Marketing and Logistics, 22*, 67–89. doi:10.1108/13555851011013164

McDonald, M., & Milne, G. (1997). Conceptual framework for evaluating marketing relationships in professional sport franchises. *Sport Marketing Quarterly, 6*, 27–34. Retrieved from http://fitpublishing.com/journals/smq

McDonald, H., & Stavros, C. (2007). A defection analysis of lapsed season ticket holders: A consumer and organizational study. *Sport Marketing Quarterly, 16*, 105–117. Retrieved from http://fitpublishing.com/journals/smq

McPhee, W.N. (1963). *Formal theories of mass behavior*. Glencoe, NY: Free Press.

Mullin, B.J., Hardy, S., & Sutton, W. (1993). *Sport Marketing* (1st ed). Champaign, IL: Human Kinetics.

Mullin, B., Hardy, S., & Sutton, W. (2014). *Sport marketing* (4th ed.). Champaign, IL: Human Kinetics.

Neale, W.C. (1964). The peculiar economics of professional sports. *Quarterly Journal of Economics, 78*(1), 1–14. doi:10.2307/1880543

Pedersen, P.M., & Thibault, L. (2014). *Contemporary sport management*. (5th ed.). Champaign, IL: Human Kinetics.

Pelnar, G.J. (2009, October 3). Competition and cooperation between professional sports franchises: The impact on ticket prices. Retrieved from SSRN database. (Accession No. 1483439)

PricewaterhouseCoopers. (2015). *At the gate and beyond. Outlook for the sports market in North America through 2019*. New York, NY: Author.

Robinson, L. (2008). The business of sport. In B. Houlihan (Ed.), *Sport & society: A student introduction* (2nd ed., pp. 307–327). London, UK: Sage.

Sharp, B., Wright, M., & Goodhardt, G. (2002). Purchase loyalty is polarised into either repertoire or subscription patterns. *Australasian Marketing Journal, 10*(3), 7–20. doi:10.1016/S1441-3582(02)70155-9

Shilbury, D. (2012). Competition: The heart and soul of sport management. *Journal of Sport Management, 26*(1), 1–10. doi:10.1123/jsm.26.1.1

Singh, J., & Uncles, M. (2016). Measuring the market performance of brands. In F. Dall'Olmo Riley, J. Singh, & C. Blankson (Eds.), *The Routledge companion to contemporary brand management* (pp. 13–31). Abingdon, UK: Routledge.

Smith, A.C., & Stewart, B. (2010). The special features of sport: A critical revisit. *Sport Management Review, 13*, 1–13. doi:10.1016/j.smr.2009.07.002

Stewart, B., & Dickson, G. (2007). Crossing the Barassi line: The rise and rise of Australian football. In B. Stewart (Ed.), *The games are not the same: The political economy of football in Australia*. Melbourne, Australia: Melbourne University Press.

Stewart, B., & Smith, A. (1999). The special features of sport. *Annals of Leisure Research, 2*(1), 87–99. doi:10.1080/11745398.1999.10600874

Tapp, A. (2004). The loyalty of football fans—We'll support you evermore? *Journal of Database Marketing & Customer Strategy Management, 11*, 203–215. doi:10.1057/palgrave.dbm.3240221

Tapp, A., & Clowes, J. (2002). From "carefree casuals" to "professional wanderers": Segmentation possibilities for football supporters. *European Journal of Marketing, 36*, 1248–1269. doi:10.1108/03090560210445164

Uncles, M., Dowling, G., & Hammond, K. (2003). Customer loyalty and customer loyalty programs. *Journal of Consumer Marketing, 20*, 294–316. doi:10.1108/07363760310483676

Uncles, M., Ehrenberg, A., & Hammond, K. (1995). Patterns of buyer behavior: Regularities, models, and extensions. *Marketing Science, 14*, G71–G78. doi:10.1287/mksc.14.3.G71

Wann, D.L., Grieve, F.G., Zapalac, R.K., & Pease, D.G. (2008). Motivational profiles of sport fans of different sports. *Sport Marketing Quarterly, 17*, 6–19.

Wright, M., & Sharp, A. (1999). *New brand effects in a Dirichlet market*. Berlin, DE: Humboldt University, Institute of Marketing.

Wright, M., Sharp, A., & Sharp, B. (2002). Market statistics for the Dirichlet model: Using the Juster scale to replace panel data. *International Journal of Research in Marketing, 19*, 81–90. doi:10.1016/S0167-8116(02)00049-6