

**The Collegiate Sport Experience: Reconceptualizing Sport Venues and College Athlete Satisfaction**

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Academic institutions across the country have and will continue to spend billions of dollars annually on facilities to recruit and retain their athletes. However, most facility research in sport focuses on consumer satisfaction instead of athlete satisfaction despite the fact satisfied athletes are going to be more likely to (a) initially commit to a school and (b) be retained by a school. Thus, it is important that researchers shift from mainly focusing on sport spectators to also focusing on college athletes, the primary users of sport facilities. Accordingly, a conceptual model of collegiate athlete satisfaction with competition venues was developed from a critical review and research synthesis of the general facility management and sport facility management literature. The proposed model created from the literature review includes financial, functional, aesthetic, and atmospheric indicators, and uses norms as comparative standards as its theoretical foundation. From this model and corresponding narrative explanation, sport researchers and athletic department administrators should gain knowledge and guidance about how to better utilize sport venues to enhance the college sport experiences of their athletes.

There is considerable research on the experiences of college athletes. Common themes found in the sport management literature include the conflict between their lives as students and as athletes (Chartrand & Lent, 1987; Hill et al., 2001), separation from the general student population (Umbach et al., 2006), and educational outcomes such as career development (Blann, 1985; Martens & Cox, 2000). Common mediators examined for these themes include race (Cooper, 2016), gender (John, 2016), sexual orientation (Fynes & Fisher, 2016), nationality (Bentzinger, 2016), and school affiliation (Becht, 2017). Curiously absent from the literature on college athletes is the impact the multi-million-dollar facilities they utilize for numerous hours each day have on their sport experiences. These collegiate facilities include competition venues (stadiums, arenas, etc.), training venues (practice gyms, strength and conditioning areas, etc.), and support venues (sports medicine, academic service, nutrition, etc.).

Most research about collegiate sport venues focuses on finances and the sport fan experience rather than the athletes using the facilities (Chen et al., 2013; Maxcy & Larson, 2015). This lack of research on college sport venues is surprising considering competition amongst schools for the talent of highly skilled athletes remains intense, especially at the National Collegiate Athletic Association (NCAA) Division I level, and such competition in the area of athletic facilities has long been dubbed the facilities arms race (Greenberg, 2001; Ngo et al., 2022; Tutka & Seifried, 2020). Though the building boom and so-called facilities arms race in college athletics is well-documented

(Caro & Elder, 2017; Hoffer et al., 2015; Wolverton et al., 2016), why and how such spending contributes to satisfactory college athlete experiences remains inadequately explored.

With most collegiate athletic programs operating as 501(c)(3) nonprofit organizations, they are incentivized to spend most, if not all, of their revenue by being prohibited from benefiting any shareholder or individual (IRS.gov, 2018). This means that if the revenues continue to be maintained or increase, then collegiate athletic departments will continue to spend lavishly, and athletic facilities are likely to remain one of the primary areas for spending as schools want to recruit and retain highly talented athletes (Huml et al., 2018; Magnusen et al., 2017). Indeed, between the United States Supreme Court ruling about name, image, likeness (NIL) (i.e., June 21, 2021, Alston decision that unanimously struck down NCAA limits on academic benefits on antitrust grounds) and the NCAA relaxing transfer rules in April of 2021, the role of facilities in the recruiting and retention processes may increasingly be important to schools vying to remain competitive in the modern era of sports.

With NIL, facilities may even take on additional importance to athletes as institutions look to incorporate and leverage in-house NIL assistance (e.g., space within the compliance offices to help athletes understand NIL contracts) to recruit, sign, and then help athletes conveniently navigate this new facet of college sports (Petersen & Judge, 2021). With the new NCAA transfer rule, which took effect in 2021 and allows all athletes who have not yet transferred the ability to do so one time and be immediately eligible to play,

schools are heavily prioritizing ways to retain athletes (Lederman, 2021). Facilities, especially sport venues, represent salient ways in which schools can cater to and recruit college athletes as well as discourage them from transferring to other, potentially rival, schools (Magnusen et al., 2014; Petersen & Judge, 2021). Thus, it is important to better understand the impact facilities have on their primary stakeholders, the college athletes.

Accordingly, this critical review and research synthesis was designed to define and conceptualize an important yet unexamined facet of the college athlete experience, sport venue satisfaction. While the concept of university facility satisfaction and its impact on recruitment and retention has been explored for students as a whole, similar studies have not been conducted with collegiate athletes and their facilities (Price et al., 2003; Reynolds, 2007; Weerasinghe & Fernando, 2018). By grounding a study of existing sport facility management and general facility management literature, an improved understanding of this topic will help guide future scholarship on sport facilities and the roles they play in enhancing the experiences of college athletes. While all the various competition, practice, and support venues in the collegiate athletics realm are important to consider from an athlete satisfaction perspective, the proposed conceptual model will focus upon the competition venue of the stadium, as this represents the most researched venue area within sport. This line of inquiry will also help athletic department administrators make more informed decisions about what is important to their athletes and how resources might be better al-

located to enhance the experiences of college athletes.

## **Overview of Sport-Based Satisfaction Research**

Within the context of sport, consumer satisfaction research is generally examined as either game/event satisfaction, service satisfaction, or a combination of the two (Kim et al., 2014). Madrigal (1995), for example, examined spectator game satisfaction in women's basketball and found team identification, expectancy disconfirmation, quality of opponent, and basking in reflected glory to all be significant determinants of satisfaction. Caro and Garcia (2007) examined event satisfaction with a road race, finding that satisfaction is primarily driven by arousal. Additionally, Yoshida and James (2010) found that both game and service satisfaction influenced behavioral intentions in Japanese spectators, while only game satisfaction influenced behavioral intentions in American spectators.

Consumer satisfaction in sport is widely studied, whereas research examining satisfaction with facilities, both sport and non-sport, is very limited. An exception to this observation is a study by Wakefield et al. (1996); they examined spectator satisfaction with the physical environment of college football and minor league baseball stadiums coined as sportscares. In their study, Wakefield et al. considered parking, facility aesthetics, scoreboards, seat comfort, layout accessibility, space allocation, signage, and the desire to stay at the venue. All the stadium factors were shown to significantly affect spectators' desires to stay at the stadium. The application of these spec-

tator satisfaction elements to the college athlete perspective may include several key elements that could be important to both venue-user groups. Additionally, Mahoney and Pastore (2014) used the work of Wakefield et al. on sports-apes to examine employee satisfaction in public assembly facilities known as sportspheres. They found that facility components had a higher correlation to job satisfaction than any of the other factors including management and intrinsic factors. This concept of facility components impact could also relate to college athletes who might perceive their roles within their use of athletic facilities as similar to employees within the sportspheres study.

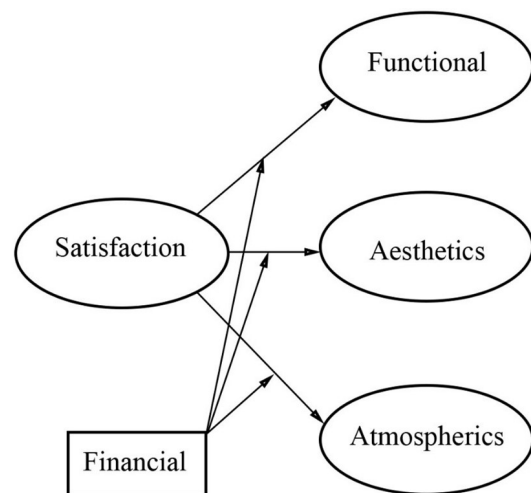
Overall, there have only been a small number of studies to examine facility satisfaction, and what research has been done focuses on sport employees and sport consumers instead of college athletes. The lack of research examining facilities in connection to college athlete satisfaction represents a major gap in the satisfaction literature. This gap in understanding can be reduced through the development of a comprehensive model of college athlete stadium satisfaction stemming from a critical review and synthesis of both sport facility management and general facility management research.

### Development of a College Athlete Stadium/Arena Satisfaction Model

The proposed model of college athlete satisfaction with competition venues is a three-factor model (functional, atmospheric, and aesthetic) with one moderator (financial). The theoretical foundation for this model is the norms as comparative standards approach to satisfaction

(Cadotte et al., 1987). This approach is used to explain how the proposed facility components are processed by college athletes to result in either satisfaction or dissatisfaction with their competition facilities. Financial indicators impact the quality of the other model dimensions, which is why the financial aspects of sport facilities are conceptualized as moderators of the functional, aesthetic, and atmospheric components. For example, the functional indicator, physical condition, is directly impacted by the amount of money spent on maintenance, which is included in the financial indicator of operations costs. An aesthetic indicator such as facility decorations is directly impacted by initial capital costs for the venue. An atmospheric indicator, electronic devices, is also directly impacted by both capital costs and operation costs. A visual representation of the conceptual model is provided in Figure 1.

**Figure 1**  
*Conceptual Model of College Athlete Satisfaction with Stadium/Arena Facilities*



The contents of this section are divided into several areas that should aid in the comprehension of how the conceptual model was developed and how it can be used to understand sport venue satisfaction. The theory is reviewed first. A brief theoretical overview of satisfaction is provided, which then closes with an explanation of the selection of the norms as comparative standards approach to satisfaction (Cadotte et al., 1987). The basis for each of the four factors is then explained. This is followed by a detailed account of the functional, aesthetic, atmospheric, and financial components.

### **Theoretical Foundations of Satisfaction**

There are several theoretical approaches used by researchers to study the phenomenon of consumer satisfaction. The key theoretical approaches to the study of consumer satisfaction include (a) expectancy-disconfirmation paradigm, (b) comparison level theory, (c) equity theory, (d) attribution theory, (e) norms as comparative standards, (f) value-percept disparity theory, and (f) counterfactual thinking. Of these, the most used theoretical approach to the study of consumer satisfaction is the expectancy-disconfirmation paradigm (Kim et al., 2014). Table 1 provides a synopsis of these seven theories.

All these theories can be applied to examining sport facility satisfaction. For instance, many athletes will visit multiple institutions on recruiting trips. These trips, in line with comparison level theory, may be evaluated based on internal standards held by the athletes rather than the outcomes they experienced.

Or, with value-percept disparity theory, athletes may base decisions primarily off their needs and desires. Overall, though exploring stadium satisfaction through a multi-theoretical lens is a worthwhile endeavor, a singular theoretical approach was chosen to best accomplish the aims of the current study. Of these seven theories, the norms as comparative standards approach to satisfaction (Cadotte et al., 1987) represents the theoretical foundation for the proposed conceptual model. Per this approach, sport facility satisfaction is defined as the disconfirmation between a college athlete's expectation for the performance of the focal venue based upon "experienced-based norms" and the college athlete's perception of the focal competition venue. The reasoning for this choice is that by the time athletes begin their college sport experiences, they have been exposed (both in-person and through various media platforms) to numerous athletic facilities. Athletes' direct and indirect experiences with sport facilities will shape their opinions and expectations for the facilities they will use during their collegiate experiences.

In a meta-analysis of customer satisfaction research, Szymanski and Henard (2001) concluded that when expectations are correlated with disconfirmation or performance, the choice of comparison standard is most important. In these situations, the most effective comparison standard is the actual experience with the products. Due to the previous experiences of most college athletes with a variety of facilities, a logical and appropriate approach for conceptualizing college athlete satisfaction with their facilities is norms as comparative standards.

**Table 1***Key Theoretical Approaches to Consumer Satisfaction*

Theory	Explanation	Background Research
Expectancy-disconfirmation Paradigm	Focuses on the level of incongruity between consumers' pre-consumption expectations of product performance to their post-consumption evaluations of the actual product performance. Positive disconfirmation occurs when actual product performance exceeds expected performance. Negative disconfirmation occurs when expected product performance exceeds actual performance.	Churchill & Surprenant (1982); Oliver (1997)
Comparison Level Theory	Defines satisfaction as the discrepancy between an outcome and an identified standard of comparison. The standard of comparison is the average of any outcomes to similar interactions that an individual has experienced directly or has knowledge of occurring.	LaTour & Peat (1979)
Equity Theory	Considers the value of the exchange from both the consumer and seller. This theory posits that in relational exchanges, individuals will seek out equity because being under-rewarded or over-rewarded will lead to distress.	Adams (1965); Oliver & Swan (1989)
Attribution Theory	States that individuals will interpret success or failure in a manner that allows them to retain a positive view of themselves. Three classifications of attributes (i.e., locus of control, stability, and volition) are used to evaluate the causes of individuals' successes and failures.	Weiner (1992)
Norms as Comparative Standards	Uses the accumulation of all previous experiences with the same or similar brands or products to form the standard by which the product being examined is evaluated.	Cadotte et al. (1987)
Value-percept Disparity Theory	Views consumer satisfaction as an emotional response to products meeting the wants, needs, and desires of the consumer. Does not evaluate product performance as a comparison to a specific standard, but only to the needs and desires of the consumer.	Westbrook & Reilly (1983)
Counterfactual Thinking	Focuses on outcomes that did not happen or "what might have been." Upward counterfactual thinking occurs when the outcome is negative and posits "what might have been better." Downward counterfactual thinking occurs when the outcome is positive and posits "what might have been worse."	Boninger et al. (1994); Mandel (2003); Roese & Olson (1993)

The use of norms as comparative standards has been applied by other researchers in the sport and leisure realm. This includes the setting of minor league baseball connecting service quality to spectator satisfaction (Koo et al., 2009), as well as to sport tourist loyalty (Chen, 2006). Within the area of niche sports, Greenwell et al. (2013) examined spectator expectations along with customer satisfaction and attendance expectations. Additionally, within the area of sport facilities, this approach has been incorporated in examining facility design impacts on satisfaction for leisure sport participants (Lee, 2003). Given these and other sport applications of the norms as comparative standards, the implementation of this approach to college athlete satisfaction with competition facilities is defensible (Kim et al., 2014).

### **Basis for the Conceptual Model Components**

The field of facility management has developed to incorporate a broad range of disciplines. Planning, designing, leasing, organizing, project management, capital management, construction management, property management, marketing, real estate management, and financial management are all important aspects of facility management (Teicholz & Noferi, 2002). Thus, when searching for potential sport facility performance measures with which to create a conceptual model, a cross-disciplinary approach to the critical review was undertaken which resulted in over 20 key performance indicators being identified in the relevant literature. These indicators were then reviewed and arranged into representative categories: financial indicators, functional indicators,

aesthetic indicators, and atmospheric indicators.

The four categories of key performance indicators used in the development of the proposed conceptual model were adapted from the work of Lavy et al. (2010), which identified four categories of key performance indicators in facilities: financial indicators, functional indicators, physical indicators, and survey-based indicators. In the current model, the functional and physical indicators from the work of Lavy et al. (2010) were combined into a single category, functional. These were combined to simplify the model as physical indicators primarily evaluate the condition of facility components that are evaluated in the functional indicator category. The aesthetic indicator category was also adapted from indicators included in Lavy's survey-based indicators. An additional collection of five atmospheric indicators (i.e., entertainment, electronic devices, spectator passion, spectator behavior, and cheering groups) were adapted from Chen et al.'s (2013) sport-focused research on stadium atmosphere. These factors were included to account for the differences between the desired atmosphere in a sport stadium/arena and the atmospheres expected of most traditional, non-sport businesses.

### **Stadium/Arena Satisfaction Components**

The content in this section provides detailed breakdowns of the key indicators contributing to college athlete satisfaction with a stadium/arena. The specific indicators selected for inclusion in the conceptual model are detailed in Figure 2. The components (i.e., finan-

**Figure 2**

*Components of Collegiate Athlete Satisfaction with Stadium/Arena Facilities*

Components of Collegiate Athlete Satisfaction			
Financial Indicators	Functional Indicators	Aesthetic Indicators	Atmospheric Indicators
<ul style="list-style-type: none"> <li>• Capital Cost</li> <li>• Operation Cost</li> <li>• Revenue Generation</li> <li>• Replacement Value</li> <li>• Maintenance Efficiency</li> <li>• Churn Rate</li> </ul>	<ul style="list-style-type: none"> <li>• Seating</li> <li>• Visibility</li> <li>• Security</li> <li>• Safety</li> <li>• Accessibility</li> <li>• Indoor Environmental Quality</li> <li>• Space</li> <li>• Equipment</li> <li>• Parking</li> <li>• Technology</li> <li>• Physical Condition (Qualitative &amp; Quantitative)</li> <li>• Resource Consumption</li> <li>• Waste</li> </ul>	<ul style="list-style-type: none"> <li>• General Appearance</li> <li>• Facility Decorations</li> </ul>	<ul style="list-style-type: none"> <li>• Entertainment</li> <li>• Electronic Devices</li> <li>• Spectator Passion</li> <li>• Spectator Behavior</li> <li>• Cheering Groups</li> </ul>

cial, functional, aesthetic, atmospheric) are further discussed in each respective subsection.

**Financial Indicators.** Six financial indicators were identified in the sport facility and general facility management literature: capital cost, operation costs, revenue generation, replacement value, maintenance efficiency, and churn rate. Two of these indicators, capital costs and operation costs, were identified in both literature subsets. For example, Epstein and Wisner (2001) identified both as key financial indicators to use in the creation of a balanced scorecard approach to general facility evaluation. Neff (2004) also identified both indicators as being important in the evaluation of indoor

athletic facilities. This was expected because these are the two most common financial factors associated with facility management. Capital costs are defined as all costs related to the construction, renovation, or expansion of a facility and the procurement of the facility's equipment. In each of the studies reviewed, encompassing both subsets of the literature, capital costs were expressed as a total dollar amount (Baldwin, 2001; Epstein & Wisner; Jasch, 2000; Neff, 2004). In comparison, operating costs represent all costs related to the operation of the facility.

Operational costs are frequently studied in the general facility management literature. The International Facility



Management Association (2008) has outlined four main categories of operational costs: utilities, maintenance, janitorial, and human resources. These categories, which remain relevant to the contemporary study of facility management, are supported by the extant body of literature and are all measured as a total dollar amount (Baldwin, 2001; Epstein & Wisner, 2001; Jasch, 2000). Comparatively, the sport and entertainment facility management literature provides less focus on operational costs. Very few sport studies include operational costs when studying sport facilities. One exception is a study by Neff (2004) that did discuss operating costs but failed to discuss utilities as one of the key sources of those costs.

While some similarities between the two subsets of the facilities literature are expected, differences between the two bodies of work are quite noteworthy. For instance, revenue generation represents the revenue generated from the use of the facility. The sport facility management literature includes revenue generation as a key financial indicator; however, this is not the case with the general facility literature. This difference makes sense considering in sport management, facilities are often viewed as a primary revenue stream through ticket sales and usage fees (Maxcy & Larson, 2015).

Also worth noting is that the indicators of current replacement value, maintenance efficiency, and churn rate were identified in the general facility management literature but not in the sport facility literature. Current replace-

ment value is defined as the total cost required to restore a facility to its original condition. This includes the full replacement cost of the building, utility systems, and grounds, but does not include the contents of the facility (IFMA, 2008). Though current replacement value is a key performance indicator (KPI) that the sport facility management field should use as a benchmark, it is not currently used in that fashion. Pati (2009) also proposed an indicator of maintenance efficiency based on a ratio of maintenance costs to a building's condition as scored by a physical condition scale such as the Building Performance Index (BPI). This is another area overlooked by sport facility management researchers. Finally, the churn rate is an indicator of employee and equipment turnover. This concept is defined as a percentage of total employees or equipment that must be replaced within a given time frame, typically a year (Baldwin, 2001). Again, though not used in the sport facility literature, churn rate is a KPI that could be of great significance to sport facility managers when analyzing the operating budgets of their facilities given that replacing equipment is a significant part of this process.

A complete list of financial indicators found in the general facility management literature is provided in Table 2. As a point of comparison, a complete list of financial indicators found in the sport facility management literature is provided in Table 3.

**Table 2**  
*Facility Management Financial Indicators*

Indicator	Description	Measurement	Sources
Operational Costs	All costs related to the operation of the facility	\$	Baldwin et al., 2001; Brady et al., 2002; Epstein & Wisner, 2001; Ho et al., 2000; IFMA, 2008; Jasch, 2000; Loosemore & Hsin, 2001;
Capital Costs	All costs related to the construction, renovation, or expansion of the facility and the procurement of the facility's equipment	\$	Baldwin et al., 2001; Epstein & Wisner, 2001; Jasch, 2000
Current Replacement Value	An estimated cost of restoring a building to its original condition.	\$	Epstein & Wisner, 2001; Ho et al., 2000, IFMA, 2008; Jasch, 2000; Loosemore & Hsin, 2001
Maintenance Efficiency Indicators	The efficiency with which maintenance activities are performed	Cost to building condition ratio	Augenbroe & Park, 2005; Pati et al., 2009
Churn Rate	The process of moving employees and/or equipment within a given time.	Percentage of total employees or equipment	Baldwin et al., 2000; Brady et al., 2002; Fowler et al., 2005

**Table 3**  
*Sport Facility Management Financial Indicators*

Indicator	Description	Measurement	Sources
Operational Cost	All costs related to the operation of the facility	\$	Neff, 2004
Capital Cost	All costs related to the construction, renovation, or expansion of the facility and to the procurement of equipment	\$	Bruning & Chen, 2016; Neff, 2004; Newell, 2004; Maxcy & Larson, 2015
Revenue Generation	The revenue generated from the use of the facility	\$	Bruning & Chen, 2016; Maxcy & Larson, 2015

The six financial indicators presented may appear to be more connected to a facility manager or athletic administrator perspective as opposed to an athlete perspective. However, the underlying financial components of the facility are viewed as moderators of the other functional, aesthetic, and atmospheric indicators that are more apparently connected to athlete perspective of venue satisfaction. For example, higher levels of capital costs and operational costs will be reflected throughout the venue in areas such as the quality of the venue design and venue amenities that will impact the athlete satisfaction.

### **Functional Indicators**

A comparison of functional indicators found in the sport facility management literature and functional indicators found in the general facility management literature reveals overlap in indicators while also producing several unique indicators. A total of 14 functional indicators were identified in the literature and included as part of the functional component of the conceptual model.

Six of the 14 functional indicators were included in both sets of the scholarly literature. These include safety, security, accessibility, space, parking, and indoor environmental quality. Safety indicators are measures taken to prevent unintentional acts of harm within the facility. Various measures of safety were identified from the critical review of the literature, including several differences between the sport and non-sport facility management literature. In the general facility management literature, for example, Epstein and Wisner (2001) called for measuring safety as a function of the

number of accidents occurring in the facility in a given time. Like Epstein and Wisner, Baldwin et.al. (2000) also included the number of incidents but went further to include the number of worker's compensation claims and the number of lost workdays/hours to accidents. Though the sport facility management literature has identified the number of incidents as a measure, it also includes the training of facility supervisors and the amount of buffer space surrounding the activity area (Judge, 2013).

Similar to safety, security indicators are defined as measures taken to prevent intentional acts of harm inside the facility. Within the sport facility management literature, Hall et.al. (2010) focused on the training of facility managers and employees on how to prevent security breaches. Likewise, in the general facility management literature, Hammond et.al. (2005) suggested using threat and risk assessments to engage managers in the security process. Additionally, Baldwin et.al. (2001) examined security as a function of the number of security incidents in a specified time period.

Accessibility is another indicator found in both subsets of the literature. This indicator represents the ease of access to the facility and the ease of access to appropriate areas within the facility (Mahoney & Pastore, 2014; Sanoff, 2001). Accessibility also includes the ease of access for both able-bodied and disabled persons.

Next, space and parking are KPIs identified in both subsets of the literature. Indoor space is defined as the utilization and adequacy of the available space in the facility whereas space for parking is defined and measured by the

total number of parking spaces available for use and the distance of the parking spaces from the facility (IFMA, 2008). Both subsets of the literature have examined the utilization and adequacy of space in similar manners. Judge et.al. (2015) and Petersen (2013), for example, examined athletic facility space adequacy as a function of the total area of the facility in ft<sup>2</sup> compared to the number of users. Similarly, Preiser (2006) examined the adequacy of public library space as a function of a ratio of the total area in ft<sup>2</sup> to the population of the community the library serves.

The final functional indicator identified in both subsets of the literature is indoor environmental quality. As the name suggests, this indicator is defined as the quality of the facility's indoor environment. Quality includes noise, light, smell, temperature, humidity, and cleanliness. Interestingly, though the indicator being assessed is similar between the two subsets of the literature, the methods of assessment are quite different. For instance, within the general facility management literature, Pati et.al (2009) outlined several direct measures of lighting and air quality; Jasch (2000) provided measurements of noise; and the IFMA (2008) gave examples of cleanliness measures. In comparison, with the sport and entertainment facility literature, factors of indoor environmental quality are measured by Likert scales of employee and spectator satisfaction with the quality of each factor (Mahoney & Pastore, 2014).

The physical condition indicators found in the facility management literature represent the most significant absence in the sport facility management literature. These factors are absent

from the extant body of scholarship about sport facilities. Within the body of research about general facility management, there are two different physical condition indicators. The first is a quantitative measure known as BPI. The BPI gives a score of the condition and performance of a facility on a 100-point scale. Pati et al. (2009) and Augenbroe and Park (2005) advocated for the use of BPI as an appropriate measure of the physical condition of a facility. There are also qualitative maintenance evaluations that assess the physical conditions of a facility.

Along with the similarities to the facility management literature, the sport facility management literature includes several distinctive indicators. These indicators include seating, equipment, and technology. Seating represents the seating capacity of the facility (Dymecki, 2014) as well as the comfort of the available seating (Biscaia, 2015). Equipment can be understood as the equipment available for the use of participants and spectators. Equipment as a KPI for sport facilities was highlighted by Judge et al. (2015) and their descriptions of the available equipment in strength and conditioning facilities. Technology as a KPI represents technological features that enhance the experience of spectators, participants, and staff (Mahoney & Pastore, 2014) used a Likert scale to evaluate the use of technology in a large arena.

A complete list of functional indicators found in the general facility management literature is included in Table 4. As a point of comparison, functional indicators found in the sport facility management literature are provided in Table 5.

**Table 4**  
*Facility Management Functional Indicators*

Indicator	Description	Measurement	Sources
Physical Condition – Quantitative	Building Performance Index	100-point scale	Augenbroe & Park, 2005; Pati et al., 2009
Physical Condition – Qualitative	Maintenance evaluation	Likert Scale	Augenbroe & Park, 2005; Cohen et al., 2001; Douglas, 1994; Hammond et al., 2005; IFMA, 2008; Kincaid, 1994; Pati et al., 2009; Preiser & Wang, 2006
Waste	The total amount of waste generated.	Volume, \$	Baldwin et al., 2000; Brady et al., 2002; Epstein & Wisner, 2001; IFMA, 2008; Preiser, 1995
Safety	The measures taken to prevent unintentional acts of harm within the facility.	Number of accidents per year, lost work hours, workers' compensation claims	Baldwin et al., 2000; Cohen et al., 2001; Epstein & Wisner, 2001; Pitt & Tucker, 2008; Preiser, 1995;
Security	The measures taken to prevent intentional acts of harm within the facility.	Number of incidents per year	Baldwin et al., 2000; Chrusciel, 2006; Hammond et al., 2005; Loosemore & Hsin, 2001; Preiser, 1995; Preiser & Wang, 2006; Sanoff, 2001
Indoor environmental quality	Includes noise, light, smell, cleanliness, temperature, and humidity.	Multiple direct measurement techniques	Augenbroe & Park, 2005; Fowler et al., 2005; IFMA, 2008; Jasch, 2000; Kincaid, 1994; Pati et al., 2009; Preiser & Wang, 2006; Sanoff, 2001
Accessibility	The ease of access to the facility and the ease of access to appropriate areas within the facility.		Preiser, 1995; Preiser & Wang, 2006; Sanoff, 2001
Resource Consumption	The total use of energy consumed by the facility.	kWh, Btu, Joules, water volume	Augenbroe & Park, 2005; Baldwin et al., 2000; Brackertz, 2006; Cohen et al., 2001; Fowler et al., 2005; Gillespie et al., 2006; Jasch, 2000; Loosemore & Hsin, 2001; O'Sullivan et al., 2004
Space	Describes the utilization of the available space and the adequacy of the available space.	Likert Scale	Baldwin et al., 2000; Brackertz, 2006; Fowler et al., 2005; Gumbus, 2005; Hinks & McNay, 1999; Kincaid, 1994; Loosemore & Hsin, 2001; Preiser, 1995; Preiser & Wang, 2006;
Parking	Availability of parking.	Number of spaces per person	Fowler et al., 2005; Gumbus, 2005; IFMA, 2008; Loosemore & Hsin, 2001

**Table 5**  
*Sport Facility Management Functional Indicators*

Indicator	Description	Measurement	Sources
Seating	Seating Capacity	Total number of seats	Biscaia, 2015; Dymecki, 2014; Newell, 2004;
	The comfort level of the spectator seating.	Size of seats in inches, Likert Scale	Palmero & Price, 2015; Wakefield et al., 1996
Visibility	The quality of the sight lines from the spectator seating areas.	None provided	Biscaia, 2015
Security	The measures taken to prevent intentional acts of harm within the facility.	Planning and training practices that employees are engaged in.	Biscaia, 2015; Hall et al., 2010; Palmero & Price, 2015
Safety	The measures taken to prevent unintentional acts of harm within the facility.	Amount of buffer space, training of supervisors, number of incidents	Judge et al., 2013
Accessibility	The ease of access to the facility and the ease of access to appropriate areas within the facility.	Likert Scale	Biscaia, 2015; Mahoney & Pastore, 2014; Neff, 2000; Wakefield et al., 1996
Indoor environmental quality	Includes noise, light, smell, cleanliness, temperature, and humidity.	Likert Scale	Biscaia, 2015; Mahoney & Pastore 2014; Neff, 2000; Newell, 2004; Palmero & Price, 2015
Space	The total available area for use.	Ft. <sup>2</sup> , Number of participants able to use the facility at one time, number of facilities within a single organization, Likert scale for the adequacy	Dymecki, 2014; Judge et al. 2015; Mahoney & Pastore, 2014; Neff, 2000; Neff, 2004; Petersen, 2013; Wakefield et al., 1996
Equipment	The equipment available for the use of participants and/or spectators.	Total number of different types of equipment	Judge et al., 2015; Newell, 2004
Parking	The available parking for spectators, participants, and staff.	Number of spaces, distance of parking from the venue, Likert Scale	Mahoney & Pastore, 2014; Palmero & Price, 2015; Wakefield et al., 1996
Technology	The technological features to enhance the experience of spectators, participants, and staff.	Likert Scale	Mahoney & Pastore, 2014

The 14 functional indicators identified include several elements that could highly resonate with athlete satisfaction. A number of areas identified in this category also connect with concepts from both sportscares (Wakefield et al., 1996) where the spectator perspective was represented, and sportspheres (Mahoney & Pastore, 2014) where the employee perspective was represented within the sport experience. While adequate space might form the most foundational functional indicator of importance, both the safety and security elements appear to be highly important from both an employee and athlete perspective. Equipment and technology also would appear to be indicators of value to athlete satisfaction and the level of investment in these aspects of the venue could provide for potential differentiation amongst venues.

### **Aesthetic Indicators**

Two aesthetic indicators were identified in the relevant facility management literature: general appearance and facility decorations. The general appearance of the facility is found in both the sport and non-sport subsets of the facility literature. It is defined as the exterior and interior visual qualities of the facility as well as the visual stimulation that the facility provides. Specific to the general facility management literature, Preiser and Wang (2006) assessed facility appearance using

a Likert scale to measure opinions of the overall design concept, site design, and attractiveness of both the exterior and interior of the facility. While assessing the visual appearance of the exterior and interior of the facility on their own merits, Sanoff (2001) also examined how well the facility fits in with its surroundings to make an aesthetically pleasing environment.

Within the sport facility management literature, Mahoney and Pastore (2014) and Biscaia (2015) explored the importance of creating a visually appealing environment. In addition to the general appearance of the facility, both sets of scholars discussed facility decorations as an important indicator. The ability of pictures (e.g., images of athletes celebrating a win), memorabilia (e.g., championship rings and trophies), and promotional items (e.g., team posters) to elicit emotional responses were seen as important factors in the functionality of athletic facilities.

General appearance and facility decorations are key indicators for inclusion in a model of college athlete stadium/arena satisfaction. Aesthetic indicators found in the facility management literature are included in Table 6. A complete list of aesthetic indicators found in the sport facility management literature is provided in Table 7.

**Table 6***Facility Management Aesthetic Indicators*

Indicator	Description	Measurement	Sources
Appearance	Exterior and interior visual qualities, visual stimulation of the facility.	Likert Scale	Baldwin et al., 2000; Preiser, 1995; Preiser & Wang, 2006; Sanoff, 2001

**Table 7***Sport Facility Management Aesthetic Indicators*

Indicator	Description	Measurement	Sources
Facility decorations	The extent to which the decorations within the facility are aesthetically pleasing.	Likert Scale	Biscaia, 2015; Mahoney & Pastore 2014
Appearance	Exterior and interior visual qualities, visual stimulation of the facility.	Likert Scale	Biscaia, 2015; Mahoney & Pastore 2014; Wakefield et al., 1996

While the aesthetic indicators category includes the smallest number of elements with only appearance and facility decorations, it still has tremendous potential to impact athlete satisfaction with the venue. Appearance along with facility decorations are both areas of great potential influence on athlete satisfaction. For example, high-end materials and finishes along with ample personal and team graphic art features are common in locker room renovations. The University of Texas spent \$7 million on such renovations in 2017 while a similar project at Louisiana State University in 2019 cost \$28 million (Gaines, 2022; Lee, 2019). These type of venue investments in aesthetic elements and their associated cost form another aspect of the facility arms race. They represent important institutional efforts to engage the interests of current and future athletes and re-

cruits, and thus are important indicators to assess.

**Atmospheric Indicators**

Atmospheric indicators represent the final component of the proposed conceptual model of college athlete stadium/arena satisfaction. Items designed to evaluate the atmosphere of a facility can be found in both the facility evaluation and service quality literature. Lighting, air quality (Pati et al., 2009), noise levels (Jasch, 2000), and cleanliness (IFMA, 2008) are all atmospheric indicators present in the facility evaluation literature. Though items relating to the facility atmosphere are present throughout the general facility management literature (e.g., Getty & Getty, 2003; Margaritis et al., 2011; Parasuraman et al., 1988; Teng et al., 2007), the concept of facility atmosphere has a considerably different



meaning within the sports realm considering the nature of sport events. Consider how in the health industry literature, items related to facility atmospherics tend to focus on having an environment suitable for a restful experience (Margari-tis et al., 2011; Teng et al., 2007); whereas the sport industry literature about atmospherics focuses on having an exciting experience for sport consumers, not a restful experience (Chen et al., 2013).

To address the difference in atmospheres between sport stadiums and arenas and nearly every other facility setting, Chen et al. (2013) developed a sport stadium atmosphere scale. They began with an initial 50-item scale that was tested in the Taiwanese Super Basketball League (SBL). A total of 1,006 responses from fans (not athletes) attending 20 different games at two venues were collected and analyzed. The final scale consisted of 33 items loaded into 10 distinct constructs: entertainment, electronic devices, facility, team traditions, team performance, spectators' passion, professional staff, spectators' behavior, team competition, and cheering groups. The researchers also included three items relating to the spectators' overall satisfaction with the game experience. The overall sport stadium atmosphere second-order factor was found to have a significant impact on fan satisfaction.

Though the sport stadium atmosphere scale created by Chen et al. (2013) is helpful to the study of sport facilities, it is important to note that the scale was developed to measure atmosphere quality and spectator satisfaction. The scale was

not designed to evaluate athlete satisfaction with a sport stadium or arena. Even so, several items are applicable to athletes' competition facility experiences and therefore worth including in the conceptual model. These items include player-fan interaction, lighting, music selection, acoustics, big-screen quality, architecture, facility condition, number of spectators, spectators' support, spectators' passion, PA announcer, fan cheers, and use of noise makers satisfaction. Collectively, these items can be organized into five indicators: entertainment, electronic devices, spectator passion, spectator behavior, and cheering groups.

The indicator of entertainment includes elements such as player interactions with fans and promotional activities within the stadium. The electronic devices indicator includes items related to lighting, music, and video boards. Spectator passion evaluates the perceived number of fans in the stadium and the perceived intensity of the fans. Next, spectator behavior evaluates the actions of the fans such as yelling at officials or reactions to players' performance. Finally, the cheering groups indicator includes items related to chants, cheers, or noise makers used by fans during the game (Chen et al., 2013).

Two tables capture atmospheric indicators. Table 8 provides atmospheric indicators found in the non-sport facility management literature. Table 9 offers a point of comparison with indicators present in the sport facility management literature.

**Table 8***Facility Management Atmospheric Indicators*

Indicator	Description	Measurement	Sources
Lighting	Quantity and quality of light.	Luminaire Efficacy Rating (LER)	Pati et al., 2009
Air quality	Thermal comfort and air cleanliness.	Air Diffusion Performance Index (ADPI)	Pati et al., 2009
Noise Levels	Amount of noise within the facility.	Decibels	Jasch, 2000
Cleanliness	Maintenance Evaluation.	Likert Scale	IFMA, 2008

**Table 9***Sport Facility Management Atmospheric Indicators*

Indicator	Description	Measurement	Sources
Entertainment	Player interactions with fans, promotional activities, etc.	Likert Scale	Chen et al., 2013
Electronic Devices	Lighting, music, video boards.	Likert Scale	Chen et al., 2013; Wakefield et al., 1996
Spectator Passion	Perceived number of fans and their intensity.	Likert Scale	Chen et al., 2013
Spectator Behavior	Fans' reactions to player's performance, fans' reactions to officials.	Likert Scale	Chen et al., 2013
Cheering Groups	Chants, cheers, and noise makers used during the game.	Likert Scale	Chen et al., 2013

The atmospheric indicators represent several aspects that could greatly impact athlete venue satisfaction. This collection of indicators represents the greatest overlap of elements that impact both spectators and athletes with the electronic devices' element, derived from the concept of sportscapes (Wakefield et al., 1996), creating a strong potential connection to athlete venue satisfaction. The connection between spectator and athlete is a recurring theme within this set of indicators that appears highly applicable to competitive venues as opposed to practice or support venues.

### **Next Steps in Collegiate Athlete Satisfaction Research**

A conceptual model of collegiate athlete satisfaction with stadium/arena facilities that includes financial, functional, aesthetic, and atmospheric indicators was developed from a critical review and research synthesis of the general facility management and sport facility management literature. Norms as comparative standards was the theoretical foundation used to inform the chosen approach to collegiate athlete satisfaction with sport venues. Given the importance of improving the experiences of college ath-

letes as well as the current gaps in understanding athlete satisfaction with sport venues, there are several important implications and directions for future research stemming from the critical review and corresponding conceptual model. The next steps for this line of inquiry include measurement (i.e., scale development) and from there, exploring the connections between stadium/arena satisfaction and college athlete experiences as well as the recruiting and retention of athletes by schools.

Measurement is a fundamental activity of science because to make sense of phenomena, researchers must develop a way to quantify or measure the things that are of interest to them (DeVellis, 2003). Thus, the first direction for future research is to utilize the conceptual model to develop a survey scale to measure college athlete satisfaction with their facilities. Developing a scale from the current conceptualization of athlete satisfaction with sport competition facilities will allow researchers to better collect and analyze data regarding the impact sport facilities have on the most important stakeholders, the athletes.

The development of a valid and reliable survey scale is a rigorous scientific process in which researchers define the construct being examined, develop items and a response scale to examine the construct, and investigate and refine the scale for quality (Johnson & Morgan, 2016). To develop a sport stadium/arena satisfaction scale, items must be generated to measure the construct of interest. Specifically, the development of relevant items should stem from the four domains identified in the conceptual framework: functional, financial, atmospheric,

and aesthetics. This scale, unlike existing scales, should wholly focus on athlete satisfaction rather than spectator or employee (non-athlete) satisfaction. Once a scale to measure college athlete satisfaction with a competition facility is developed, numerous avenues of research can be explored.

First, there is a gap in the college athlete experience literature when it comes to the impact of facilities. It is common within the literature focused on the experiences of college athletes for personal factors such as race (Cooper, 2016), gender (John, 2016), and sexual orientation (Fynes & Fisher, 2016) or institutional factors such as division affiliation (Becht, 2017) to be used as study variables. Quite surprisingly, given the amount of financial investment made with facilities, the built environments have not been examined by scholars at present. A scale developed from the proposed conceptual model will better equip researchers to examine the association between facilities and athletes' college experience thereby addressing a limitation in the literature centered on issues in intercollegiate athletics.

Second, the relationship between college athletes' levels of satisfaction with their competition facilities and recruiting and retention is another area that warrants consideration. The effect of facilities on recruiting has been observed by several researchers (e.g., Huml et al., 2018; Magnusen et al., 2014; Magnusen et al., 2017; Petersen & Judge, 2021). Though helpful, these studies have focused on facility characteristics rather than the opinions of the athletes. In addition to recruiting athletes, the satisfaction-retention relationship experienced

by college athletes should be examined, especially considering that since the NCAA relaxed its transfer rules in 2021, schools are funneling considerable financial resources to efforts focused on the retention of their college athletes (Lederman, 2021). These factors potentially connect with the facility arms race and the need to examine not only the level of facility investment but also the impact of that investment on athlete satisfaction.

The study of college athlete retention has grown rapidly over the last several years (Hunter, 2015), but the impact of athlete satisfaction with sport facilities on retention remains underexplored. Rather than examine athletes' levels of satisfaction with sport facilities, personal factors such as nationality (Battle, 2016), race and gender (Johnson et al., 2013), and institutional division affiliation (Nash, 2017) have been considered in connection to retention. Thus, this area represents another needed avenue of research exploration.

Ultimately, this conceptual model can form the basis for the development of scale instruments that could measure collegiate athlete venue satisfaction in valid and reliable ways. These venue satisfaction scales could be developed with items aligned with the primary indicator areas identified within this conceptual model. This model also has potential application to multiple venue types by aligning specific item content to specific venue types within the collegiate sport realm.

Competition venues like stadiums, arenas, and ballparks along with practice venues like practice gyms, indoor turf fields, and strength and conditioning facilities, as well as support venues

like athletic training and sport medicine facilities, academic support centers, and nutrition or dining facilities could each employ specific and customized scales to assess athlete satisfaction. Given the greater prior research attention within the competition venues, the development of an athlete venue satisfaction scale might begin with these venue types. However, scale development for practice and support venues would also be of great importance given that athletes often spend a larger proportion of their time and activities within these venue types. Overall, the development and use of collegiate sport venue satisfaction scales could generate important feedback that informs sport administrators and facility planners on the current venue performance as well as provide insights for future venue improvement.

### **Managerial Implications**

As collegiate sports trend toward a business orientation, universities face challenges of managing operating budgets and maximizing revenue. Scholars (e.g., Goff, 2014) have suggested that the economic driver in the collegiate athletic facility boom is consumer demand. For example, while the overall attendance of Football Bowl Series (FBS) football games has experienced a slight decline over the last few years, most of the top programs continue to fill their stadiums on a weekly basis (NCAA, 2020). Therefore, to keep up with the increasing demand for top-level college football tickets and capitalize on potential revenue, many universities are adding extra seats and more fan amenities to their stadiums. Though such additions provide benefits to sport spectators and consumers, it is

unclear how such spending benefits the athletes. Given the intensifying effort of recruitment and retention within the current NIL and transfer portal era, greater emphasis upon the impact of these sport facilities directly upon the athletes and their satisfaction is warranted. That is why concern for college athletes is central to this research review and synthesis.

The proposed conceptual model does not provide a tool to measure college athlete satisfaction with stadium/arena facilities; however, it does provide a comprehensive review and much-needed conceptual framework that should help sport administrators and coaches better understand and address this area of inquiry. Indeed, reviewing the proposed model and carefully considering the potential impact of each of the indicators contained within these four components will help coaches and administrators make better informed decisions about their facilities with specific regard to the athletes. For instance, aspects of facilities that college athletes are thought to be satisfied with can be preserved during a renovation or replicated in a new construction project.

Examples of addressing shortcomings and preserving popular amenities in new or renovated stadiums or arenas can be found throughout college sport. Using the proposed conceptual model as a guide, athletic administrators should be better able to gather specific feedback about key areas contributing to athlete satisfaction and then use that information to make appropriate design decisions to competition facilities used by athletes across all the various NCAA sports. While a greater deal of attention may lie at the highest levels of NCAA

Division I programs (e.g., member institutions in the Big Ten Conference and Southeastern Conference), the proposed model applies to all NCAA levels. Indeed, this includes NCAA DII and DIII facilities, where there is growing interest among coaches and administrators in athlete satisfaction and recruiting decision processes (Zvosec et al., 2021).

Another managerial implication of the proposed conceptual model pertains to resource allocation in relation to venue construction and renovation. With the massive differences in the budgets of college athletic programs continuing to widen (NCAA Research, 2020), any avenue for minimizing or mitigating the effects of financial factors has the potential for significant impacts on enhancing parity in college athletics. Therefore, even without a formal measurement tool, athletic administrators can still use the model as a guide for conducting structured and informed conversations with their athletes about satisfaction with their competition facilities. From such conversations, athletic administrators should gain a clearer understanding of where to spend money on facility projects that have the best probability to maximize return on investment from an athlete satisfaction perspective. Specifically, athletic department administrators could craft closed- and open-ended questions from each of the components to guide their conversations with athletes as they look to make facility improvements. For example, functional questions for athletes are: “Are you satisfied with the physical conditions of your athletic facilities?” and “How might the cleanliness of the stadium be improved?” Aesthetic questions to consider asking athletes include:

“Are you satisfied with the images of athletes that are present in the hallways?” and “What sort of images and memorabilia would you like to see displayed?”. Lastly, atmospheric questions that could be presented include: “Are you satisfied with the student cheering groups?” and “What sort of player interactions with fans would you like to see implemented?”

### Conclusion

NCAA Division I institutions spent approximately 18% of their total athletic budgets on facility expenditures in 2019. Although this amounts to over \$2.8 billion (NCAA Research, 2020), specific research on the impact these facilities have on college athlete satisfaction remains absent from the sport management literature. Thus, sport researchers must shift from only focusing on sport spectators or sport employees to also focusing on the primary users of sport facilities, the athletes. The theory-grounded conceptual model for athlete satisfaction with stadium and arena facilities developed from this research review crafts a framework for bridging this important gap in the sport management and facilities literature. Indeed, given that the facility arms race in collegiate athletics remains alive and well (Petersen & Judge, 2021), the proposed model can be used by both scholars and practitioners to understand the role of athlete satisfaction in the facility arms race as well as how concepts from sportscapes (e.g., aesthetics, stadium access) and sportspheres (e.g., facility technology) can be applied to athletes instead of only sport spectators or sport employees.

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