ABSTRACT

An Examination of Factors Affecting Student-Athlete Satisfaction with Stadium Facilities

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College athletic departments are in the midst of an era of rapidly increasing budgets and an accompanying facility construction and renovation boom (Fulks, 2015). Athletic departments are building bigger, nicer, more state-of-the-art facilities at extremely high rates and the building boom has persisted through the most recent economic recession (Bennett, 2012). As facility construction and renovations boom the question becomes, what impact are these new facilities having on their institutions and more specifically their athletes? Researchers have examined the impact of numerous factors on the student-athlete experience, but not the impact of the built environment, specifically athletic facilities. To conduct this type of research, a tool to assess facilities from the student-athletes' perspective must be developed. Therefore, this study developed and validated a survey scale to measure student-athlete satisfaction with football stadium facilities.

A review of consumer satisfaction, facility evaluation, and service quality literature informed the development of a three factor (functional, atmospheric, and

aesthetic) theoretical model with one moderator (financial). From this model a 54-item survey was developed with all responses using a seven-point Likert scale. The survey was distributed to football student-athletes (n = 779) from a cross-sectional sample by NCAA division of ten universities across the United States. Exploratory factor analysis revealed six underlying factors of student-athlete satisfaction with stadium facilities: functional, convenience, game day, audio video, safety security, and aesthetics. Confirmatory factor analysis revealed a good fit to the data [χ 2 (1388) = 5516.73, p < .001, CFI = .89, TLI = .88, RMSEA = .08]. Additionally, financial variables were found to have weak positive correlations to each of the six underlying factors resulting in a final model for student-athlete satisfaction with stadium facilities of six factors with one moderator. The instrument developed from this study has numerous theoretical and managerial implications. The instrument can be used by researchers to examine the impact of athletic facilities on the student-athlete experience, student-athlete recruitment, and student-athlete retention. Additionally, the instrument can be used by athletic administrators to provide valuable information from the student-athletes that can be used when making facility-related decisions.

An Examination of Factors Affecting Student-Athlete Satisfaction with Stadium Facilities

by

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A Dissertation

Approved by the Department of Health, Human Performance, and Recreation

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To John and Sarah,

Always dream big
Embrace the challenge
Do your best
Rest in Christ

I love you!

CHAPTER ONE

Introduction

Introduction to the Problem

Big time college athletics are big business, and business is booming. The majority of Division I institutions are operating with budgets in excess of $10,000,000 with many exceeding $125,000,000 (Fulks, 2015). One major evidence of the boom of the college athletic business is manifest in the boom of construction around the country. College athletic departments are building bigger, nicer, more state-of-the-art facilities at extremely high rates, and this occurred both during and post-economic recession of the late 00's era (Bennett, 2012). As facility construction and renovations boom, the question becomes, what impact are these new facilities having on their institutions and more specifically their athletes?

From 2003 to 2010, over thirty-five Football Bowl Subdivision (FBS) universities have chosen to invest in football stadium renovation or reconstruction of at least $10 million, with many projects exceeding $50 million (Fulks, 2010). The stated reasons for these projects are various. Many college administrators view athletics as the "front porch" of the institution, and it has been argued that investing in collegiate athletics leads to increased success in competition. Athletic success carries benefits of increased publicity, enhanced pride, and more valued campus community (Maxcy, 2015). Numerous studies have investigated the positive impact of athletic success on student applications and the quality of incoming students (McCormick & Tinsley, 1987; Borland, Goff, & Pulsinelli, 1992; Murphy & Trandel, 1994; Goff, 2004), and also on increased

financial donations to the university (Siegelman & Carter, 1979; Siegelman & Brookheimer, 1983; Baade & Sundberg, 1994; Grimes & Chressanthis, 1994; Rhoads & Gerking, 2000). For lesser known institutions, having a successful athletic program has become one of the fastest ways to raise the profile of the university. When an athletic program is successful, the profile of the university increases (College football, 2012).

There are three main schools of thought about the impact of athletic facility construction and renovation on an institution. The first is a purely economic view. Demand for college athletics is high and in order to meet that demand and capitalize on potential new revenue, schools must create more supply in the form of more seats (Goff, 2014). These athletic departments then use the additional revenue to fund not only their revenue generating programs, but their entire athletic departments (Suggs, 2012). The second view is much more image related. Many college administrators view athletics as the "front porch" of their institutions. These administrators view athletics as a way to enhance their institution's profile, attract students, and increase donations. To these administrators, building a new stadium or renovating their current stadium seeking athletic program success is just a necessary price of doing business (Bachman, 2013). The final point of view is a negative one. Many people view the boom in facility construction, and athletic spending in general, as unsustainable and ultimately leading athletic departments to eliminate smaller sport programs in order to allocate more funding to the revenue producing sports (Hogshead-Maker, 2010).

As collegiate sports trend toward a business orientation, universities face challenges of managing operating budgets and maximizing revenue, and it has been suggested that the economic driver in the collegiate athletic facility boom is consumer

demand (Goff, 2014). While the overall attendance of FBS football games has experienced a slight decline over the last few years, the majority of the top programs continue to fill their stadiums on a weekly basis (Soloman, 2016). In order 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; but what about the student-athletes? What effect are these facilities having on the people that use them the most?

Statement of the Problem

The National Collegiate Athletic Association (NCAA) is a member-led organization that governs athletic competition for its 1,123 member institutions (NCAAa, 2017). The NCAA remains adamant that collegiate athletics are to be student-athlete centric. The association's seven core values reflect this by having no reference to fans, money, or commercialism, instead focusing on the academic, social, and athletic experiences of the student-athletes (NCAAb, 2017). Despite the values of the NCAA, an organization led by academic institutions, the vast majority of research on collegiate athletic facilities focuses on finances and the fan experience rather than the student-athletes using the facilities (Maxcy & Larson, 2015; Chen, Lin, & Chiu, 2013).

In addition to the lack of facility research focusing on the student-athlete, the literature examining the student-athlete experience is lacking focus on the impact of facilities. There is a great deal of research on the student-athlete experience. Common themes found in the literature include the conflict between their lives as students and as athletes (Chartrand & Lent, 1987; Hill, Burch-Ragan, & Yates, 2001), separation form the general student population (Umbach, Palmer, Kuh, & Hannah, 2006), and educational

outcomes of student-athletes (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). The impact that the multi-million-dollar facilities that student-athletes spend hours each day utilizing have on the student-athlete experience remains absent from the literature.

Purpose of the Study

The purpose of this study is to develop and validate a multiple-item scale to measure satisfaction with football facilities as perceived by the athletes using the facilities. This study will review the relevant literature to define the construct of satisfaction with football facilities and develop a conceptual model for the measurement of the construct. The conceptual model will then be used to develop a survey scale and both exploratory and confirmatory factor analysis will be used for validation of the scale. This scale will allow for the collection of data examining student-athlete satisfaction with football facilities, the analysis of the data, and potentially the adaptation of the scale to other sport facilities.

Significance of the Study

The development of a survey scale to measure student-athletes' satisfaction with their facilities will allow researchers to collect and analyze data regarding the impact facilities have on student-athletes. The building boom and "arms race" in college athletics is well documented (Hoffer et al., 2015; Caro & Elder, 2017; Wolverton et al., 2016). With the vast majority of 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 as long as the revenues continue to pour in, collegiate athletic departments are going to continue to spend lavishly and athletic facilities are likely to remain one of the primary areas for spending. It is important to seek a better understanding of the impact these facilities are having on their primary stakeholders, the student-athletes. An improved understanding will allow administrators to make more informed decisions about what is important to their student-athletes and how resources are allocated. This scale will also open additional avenues for researchers to examine, and hopefully improve, the student-athlete experience.

Research Questions

1. What are the underlying dimensions of student-athlete satisfaction with a football stadium?
2. Which items best represent the underlying dimensions of student-athlete satisfaction with a football stadium?

Definition of Terms

This section contains a list of terms that will be introduced during this study. Each term contains a reference that can be accessed should the reader need more clarification on the topic.

Expectancy-Disconfirmation Paradigm – A theoretical approach to the measurement of satisfaction in which satisfaction is measured as the difference between expected product performance and actual product performance (Churchill & Surprenant, 1982).

Key Performance Indicator (KPI) – KPIs are relevant metrics that express the performance of a facility in a holistic manner (Lavy, Garcia, & Dixit, 2009).

NCAA - The National Collegiate Athletic Association is a voluntary membership organization that governs intercollegiate athletics programs in the United States. It is comprised of institutions, conferences, organizations and individuals committed governing competition in a fair, safe, equitable and sportsmanlike manner, and to integrating intercollegiate athletics into higher education so that the educational experience of the student-athlete is paramount (NCAA, 2018).

Division I - A subdivision of the NCAA consisting of nearly 350 active member institutions. Division I is further sub-divided into three groups: Football Bowl Subdivision (FBS) for schools with football teams that are fully funded with 85 scholarships, must meet minimum attendance requirements, and compete in traditional bowl games in the post-season; Football Championship Subdivision (FCS) for schools with football teams that have scholarships limited to 63 and compete in a national championship playoff post-season; and institutions that do not sponsor football (NCAA, 2018).

Division II – A subdivision of the NCAA consisting of more than 300 active member institutions. Division II offers a partial-scholarship model for financial aid and limits football scholarships to 36 per institution (NCAA, 2018).

Division III - A subdivision of the NCAA consisting of more than 450 active member institutions. Division III utilizes a non-scholarship model for athletically based financial aid intended to minimize conflicts between athletics and academics (NCAA, 2018).

Norms as Comparative Standards – A theoretical approach to the measurement of satisfaction in which satisfaction is defined as the difference between expectations based

upon the cumulative total of past experiences with similar products and actual product performance (Cadotte, Woodruff, & Jenkins, 1987).

Quality – Quality can be viewed through different lenses. Objectively, the quality of a product can be measured by using indicators such as durability and number of defects. Other measures of quality are more objective such as consumers' perceptions of a product (Parasuraman, Zeithaml, and Berry, 1988). This study will focus on consumers' perceptions of a product.

Satisfaction – The disconfirmation between the consumer's expectations for the performance of a focal brand based upon "experience-based norms" and the consumer's perception of the performance of the focal brand (Cadotte, Woodruff, & Jenkins, 1987).

SERVQUAL – A 22-item instrument for assessing consumer perceptions of service quality in service and retail organizations (Parasuraman et al., 1988)

Assumptions

1. It was assumed that all respondents answered each item honestly. Anonymity and confidentiality of responses were ensured to enable respondents to answer truthfully.
2. It was assumed that all respondents carefully read each item and responded to the best of their ability.
3. It was assumed that all respondents met the inclusion criteria.

Limitations

1. Access to the student-athlete population is restricted, making it nearly impossible to obtain a true random sample. This study utilized a stratified sample by competition level of convenience by using student-athletes from collegiate

football teams in which coaches and administrators would allow the survey instrument to be administered. From the initial sample, two sub-samples were created using random assignment for the two steps of data analysis.

2. The sample of convenience led to an under representation of institutions in the Northeastern and Western United States.
3. This study was limited by the knowledge of the student-athletes participating in the study. While it was assumed that the participants are familiar with the majority of the items in the scale, it was unknown whether they have the knowledge to appropriately answer questions related to the financial elements of the survey.

Delimitations

1. This study examined football stadiums used for competition by NCAA institutions. The study will not include NAIA, junior college, professional, or high school football stadiums.

2. This study only examined football stadiums owned by their institutions. Stadiums leased by a university from a professional or high school team were not included in the study.

3. Participants in this study were current football student-athletes at NCAA member institutions. Participants must have competed for their university for at least one season. Recent transfers or new enrollees were not included.

4. To increase the generalizability of the results, this study included institutions from each of the three NCAA divisions.

Nature of the Study

This research project was designed as a survey scale development study. The study was initiated with a review of the pertinent literature to establish an operational definition for the construct being studied, satisfaction with stadium quality. The review of literature was also used to establish a conceptual model for the dimensions of the satisfaction construct. A survey was developed to measure the satisfaction construct and then the survey was validated. Validation of the survey was completed through a two-part process. First, exploratory factor analysis was conducted to determine the underlying dimensions of the satisfaction construct, which items best represent the construct, and dimensions in which each of the items load. From this a theoretical model for satisfaction with a stadium was developed. The second part of the validation process was to use confirmatory factor analysis to assess the validity of the theoretical model developed in the first step of the process.

CHAPTER TWO

Literature Review

Introduction

A review of relevant literature was foundational to this research for two primary reasons: first to establish a definition of the construct of satisfaction with a football stadium and second to develop a conceptual model for the study of the construct. This review will include an examination of consumer satisfaction and the theoretical approaches to the measurement of consumer satisfaction, a review of literature detailing the measurement of quality in the service industry, an analysis of facility evaluation measures, and a review of literature pertaining to the atmosphere in sport facilities.

Satisfaction

Consumer satisfaction is a prominent topic within the marketing literature. More than 15,000 academic and trade articles have been published on the topic exploring the antecedents and consequences of satisfaction (Kim, Magnusen, & Kim, 2014). When examining the consumer satisfaction literature, there are several theoretical approaches used by researcher to study the phenomenon. This portion of the review of literature will outline concepts from several of the most common theoretical approaches found in the literature. The key theoretical approaches to the study of consumer satisfaction examined in this review include the expectancy-disconfirmation paradigm, comparison level theory, equity theory, attribution theory, norms as competitive standards, value-percept disparity theory, and counterfactual thinking (Kim et al., 2014). Key methodological and measurement constructs associated with the study of satisfaction will also be included in

this review. This review will also illuminate the application of these concepts to facilities in general and to sport facilities specifically.

The most commonly used theoretical approach to the study of consumer satisfaction is the expectancy-disconfirmation paradigm. The expectancy-disconfirmation paradigm is based upon the level of incongruity between the consumers' pre-consumption expectations of product performance to their post-consumption evaluations of the actual product performance (Churchill & Surprenant, 1982). As such, Churchill and Surprenant (1982) identified three constructs through which consumer satisfaction can be measured: expectations, product performance, and disconfirmation. The most common measure of expectations is a pre-consumption evaluation of expected product performance. However, one major weakness of this approach is that it does not account for changes during or after consumption, known as hindsight expectations (Kim et al., 2014). The expectancy-disconfirmation model uses the same scale to measure both expected product performance pre-consumption, and actual product performance post-consumption. The construct of disconfirmation arises from the difference between the two measures and can be described as either positive disconfirmation or negative disconfirmation. Positive disconfirmation occurs when actual product performance exceeds expected performance and usually results in satisfaction. Negative disconfirmation occurs when expected product performance exceeds actual performance and usually results in dissatisfaction (Oliver, 1997).

Comparison level theory was first introduced by Thibaut and Kelly (1959) and applied to consumer satisfaction by LaTour and Peat (1979). Similar to the expectancy-disconfirmation paradigm, comparison level theory defines satisfaction as the

discrepancy between an outcome and an identified standard of comparison. Where comparison level theory differs from the expectancy-disconfirmation paradigm is in how the standard of comparison is determined. In comparison level theory, the standard of comparison is the average of any outcomes to similar interactions that one has experienced directly or has knowledge of occurring. These comparisons can fall into one of three categories: outcomes directly experienced, outcomes experienced by others, and outcomes promised by the service provider (LaTour & Peat, 1979).

In 1987, Cadotte, Woodruff, and Jenkins expanded upon the expectancy-disconfirmation paradigm to develop a new perspective called norms as comparative standards. The norms as comparative standards approach deviates from the expectancy-disconfirmation paradigm in that it uses other brands and products as the basis for pre-consumption expectations rather than only the brand or product being examined. Norms as comparative standards uses the accumulation of all pervious experiences with the same or similar brands or products to form the standard by which the product being examined is evaluated.

Equity theory posits that in relational exchanges, individuals will seek out equity because being under- or over-rewarded will cause distress (Adams, 1965). This theory considers the value of the exchange from both the consumer and the seller. With equity theory constructs, the consumer and the seller will evaluate their inputs to the exchange against the inputs from the other party in an effort to maintain balance and increase the longevity of the relationship (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 (Weiner, 1992).

Individuals use three classifications of characteristics or attributions to evaluate the causes of their successes or failures. The first classification of characteristics is locus of control and refers to whether the cause of success is attributed to the individual (internal) or the product (external). The second classification of characteristics is stability and refers to the cause of success or failure as either temporary or permanent. The third classification of characteristics is volition and refers to the cause of success or failure as either controllable or uncontrollable (Weiner, 1992). Attribution theory has its greatest application to consumer satisfaction when examining repeat purchase decisions (Kim et al., 2014).

Developed by Westbrook and Reilly in 1983, the value-percept disparity theory is a perspective that views consumer satisfaction as an emotional response to a products confirmation to the wants, needs, and desires of the consumer. Contrary to the expectancy-disconfirmation paradigm, this theoretical perspective does not evaluate product performance as a comparison to a specific standard, but only the needs and desires of the consumer. The value-percept disparity theory assumes that there is greater satisfaction when the disparity between product performance and the desires of the consumer is smaller.

The final major theoretical perspective found in the literature for examining consumer satisfaction is counterfactual thinking. Counterfactual thinking derives its name from the phenomenon is focused on outcomes that did not happen or "what might have been" (Mandel, 2003). Counterfactual thinking can be categorized into either upward counterfactual thinking or downward counterfactual thinking. 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, Gleicher, & Strathman, 1994). Counterfactual thinking is also viewed as either the addition or deletion of antecedents to the satisfaction outcome. Additive counterfactual antecedents add new elements to recreate reality such as "if the concession stand would have offered ice cream, I would have been happy." Conversely, subtractive antecedents remove elements such as "if I had not gotten ice cream from the concession stand, I would have been sad" (Roese & Olson, 1993). Kim et al. (2014) proposed that downward counterfactual thinking will positively influence consumer satisfaction and upward counterfactual thinking will negatively influence consumer satisfaction.

Within the consumer satisfaction literature, several studies have focused on the sport context. Within the sport context, consumer satisfaction research is generally examined as either game/event satisfaction, service satisfaction, or a combination of the two (Kim et al., 2014). In 2007, Caro and Garcia examined event satisfaction with a road race, finding that satisfaction is primarily driven by arousal. Madrigal (1995) 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. Greenwell, Fink, and Pastore (2002) and Tsuji, Bennett, and Zhang (2007) examined service satisfaction within the sport setting using the SERVQUAL framework which is further discussed in a separate section. Yoshida and James (2010) examined both game and service satisfaction in Japanese professional baseball and American college football spectators using subscales from Wakefield et al. (1996), Greenwell et al. (2002), and Madrigal (1995). Yoshida and James (2010) found

that both game and service satisfaction had an influence upon behavioral intentions in Japanese spectators while only game satisfaction had an influence upon behavioral intentions in American spectators.

While the studies discussed in the previous paragraph, and the majority of the sport-based research on consumer satisfaction, have been grounded in the expectancy-disconfirmation paradigm, there have also been a few studies to use counterfactual thinking as the basis for examination. Medvec, Madey, and Gilovich (1995) and McGraw, Mellers, and Tetlock (2005) both used counterfactual thinking to examine satisfaction in Olympic athletes. Medvec et al. (1995) found that bronze medalists tend to be more satisfied than silver medalists because silver medalists compared themselves to the gold medalist while bronze medalists compared themselves to the 4th place finisher. McGraw et al. (2005) found that the counterfactual comparisons of Olympic athletes were more often made against prior expectations. Bronze medalists that were not expected to win a medal were more satisfied than silver medalists that were expected to win gold, however, silver medalists were more satisfied than bronze medalist overall.

Research examining satisfaction with facilities, both sport and non-sport, is very limited and the majority is contained within the SERVQUAL literature which is discussed at length in a separate section of this literature review. Within the sport facility literature there are two studies examining facility satisfaction that are not directly associated with SERVQUAL. Wakefield, Blodgett, and Sloan (1996) examined spectator satisfaction with the physical environment of college football and minor league baseball stadiums known as "sportscapes." In this study, authors examined parking, facility aesthetics, scoreboards, seat comfort, layout accessibility, space allocation, signage, and

the desire to stay at the stadium. All of the stadium factors were shown to have a significant effect on spectators' desires to stay at the stadium. Additionally, Mahoney and Pastore (2014) used the work of Wakefield et al. on sportscapes to examine employee satisfaction in public assembly facilities known as "sportspheres." This study found that facility components had a higher correlation to job satisfaction than any of the other factors including several management and intrinsic factors. While there have been a few studies to examine facility satisfaction, the overall lack of research examining facilities represents a major gap in the satisfaction literature.

Quality Measures

While certain aspects of quality can be measured objectively, such as durability or number of defects (Crosby, 1979; Garvin, 1983), many aspects of quality are more abstract in nature. The perceptions of the consumer are at the core of defining the quality of many goods and services (Parasuraman, Zeithaml, & Berry, 1988). These perceptions are subjective assessments made by the consumer and for many years lacked a quantitative measurement. In 1988, Parasuraman et al. developed the SERVQUAL scale to measure service quality, and SERVQUAL has become the dominant tool for measuring consumer perceptions of quality. The SERVQUAL instrument has been used as both the basis for further scale development and as the instrument for quantitative research.

Developed in 1988 by Parasuraman et al., SERVQUAL is a 22-item instrument used to qualitatively measure service quality. The development of the SERVQUAL scale began with the identification of 10 potentially overlapping dimensions of service quality: tangibles, reliability, responsiveness, communication, credibility, security, competence,

courtesy, understanding/knowing the customer, and access. Researchers then generated 97 items on a seven-point scale ranging from "Strongly Agree" (7) to "Strongly Disagree" (1) with no labels for scale points 2 through 6 to examine the 10 identified dimensions. The SERVQUAL instrument was condensed and refined through a two-step data collection process. In the first step of data collection, 200 adults were given the survey and the results were used to purify the survey down to 54 items. The 54 items were then factor analyzed and factor loadings revealed seven dimensions and a total of 34 items. In the second stage of data collection another 200 adults were given the 34-item survey and the same scale purification and factor analysis process was repeated resulting in a 22-item scale spread over five dimensions.

Three of the five identified dimensions were retained from the original set of ten dimensions while the remaining two dimensions were created as combinations of elements and items from the original dimensions. The first of the retained dimensions was tangibles ($\alpha = 0.72$) and consists of physical facilities, equipment, and appearance. Reliability ($\alpha = 0.83$) was also retained from the original model. Reliability was defined as the ability to perform the promised service dependably and accurately. The final dimension retained from the original model was responsiveness ($\alpha = 0.82$) and was defined as the willingness to help customers and provide prompt service. The final two dimensions, assurance ($\alpha = 0.81$) and empathy ($\alpha = 0.86$), were identified using items form the other seven original dimensions. Assurance is defined as the knowledge and courtesy of employees and their ability to inspire trust and confidence. Empathy is defined as the caring and individualized attention the firm provides its customers. The

only reliability measures reported by the authors of the SERVQUAL scale were the Cronbach's alpha coefficients for each dimension (Parasuarman et al., 1988).

The SERVQUAL instrument was developed to be a broadly applicable tool and has been used to measure service quality in a variety of different settings. SERVQUAL has been used many times to research service quality in the healthcare industry with Babakus and Mangold initially adapting the instrument for use in the hospital setting in 1992. From there the instrument has been used to examine service quality in acute care centers (Carman, 1990), primary care centers (Amaravathi & Anand, 2016), military healthcare centers (Bahadori et al., 2013), public and private healthcare centers (Isik, Tengilimoglu, & Akbolat, 2011), and many other healthcare settings. Additionally, SERVQUAL has been used to measure service quality in many other settings such as banking (Cronin & Taylor, 1992), fast food (Lee & Ulgado, 1997), telecommunications (van der Wal et al., 2002), universities (Kang et al., 2002), and numerous other industries (Ladhari, 2009). While the SERVQUAL instrument has been used in a variety of different industries and settings, the universality of the scale has been subject to some criticism. Lapierre et al. (1996) examined the evolution of SERVQUAL research and concluded that the SERVQUAL instrument was best suited as a starting point for the customization of service quality scales to specific settings.

Several quality assessment instruments have been developed using the SERVQUAL model. The lodging quality index (LQI) was developed in 2003 by Getty and Getty using the SERVQUAL model. Getty and Getty used the original 10 dimensions of SERVQUAL as the basis for their scale development. A 63-item survey was generated, tested, analyzed, and purified resulting in a 26-item final scale covering five

dimensions: tangibility, reliability (included reliability and credibility), responsiveness, confidence (included competence, courtesy, security, and access), and communication (included communication and understanding).

In 2007, Teng, Ing, Chang, and Chung used SERVQUAL as the starting point for their development of the service quality scale for surgical hospitalization (SQSH). The SQSH began as a 42-item survey based upon the five dimensions of the SERVQUAL scale. Testing, analysis, and purification of the initial survey resulted in a 29-item survey that loaded into six dimensions: needs management, assurance, sanitation, customization, convenience and quiet, and attention. Of the 12 initial items from the tangibles construct, five loaded into the sanitation construct, two loaded into the convenience and quiet construct, and five were removed from the final scale. Reliability measures reported in SERVQUAL based scales can be found in Table 1.

Table 1
Reliability measures for SERVQUAL based scales

Setting	Authors	*Cronbach's* α	X^2	CFI	TLI	RMSEA
Hospital	Babakus & Mangold, 1992	0.759-0.903	159.90	Not Reported	Not Reported	0.064
Medical	Bahadori, Mousavi, Sedeghifar, & Haghi, 2013	0.88	Not Reported	Not Reported	Not Reported	Not Reported
General Service	Cronin & Taylor, 1994	Not Reported	333.26-464.08	Not Reported	Not Reported	0.204-0.257
Hotels	Getty & Getty, 2003	Not Reported	Not Reported	Not Reported	Not Reported	Not Reported
General Service	Kang, Jame, & Alexandris, 2002	0.872-0.938	223.71	0.98	0.97	0.045
Hotels	Ladhari 2012	0.828-0.921	310.607-479.954	0.857-0.960	Not Reported	0.037-0.069
Fast-food	Lee & Ulgado, 1997	0.81-0.88	Not Reported	Not Reported	Not Reported	Not Reported
ENT Outpatient	Margaritis, Katharaki, & Katharakis, 2012	0.70-0.94	151.431	Not Reported	Not Reported	Not Reported
General Service	Parasuraman, Zeithaml, & Berry, 1988	0.72-0.86	Not Reported	Not Reported	Not Reported	Not Reported
Hospital	Teng, Ing, Chang, & Chung 2007	0.642-0.887	Not Reported	Not Reported	Not Reported	Not Reported
Telecom	Van der Wal, Pampallia, & Bond, 2002	0.63-0.88	Not Reported	Not Reported	Not Reported	Not Reported

Service quality and the SERVQUAL scale have been shown to result in increased customer satisfaction. Through structural equation modeling, Bitner (1990) showed a causal relationship between service quality and customer satisfaction. Additionally, Bolton and Drew (1991) apply the expectancy-disconfirmation paradigm to service quality and find that perceptions of service quality are based upon an attitude that results

from perceptions of service quality compare to expectation based upon prior experiences. Based upon these findings, Cronin and Taylor (1992) developed SERVPERF, a measure of service performance. In SERVPERF, the researchers created a survey consisting of three sets of 22 identical items as well as three questions examining overall satisfaction, overall service quality, and purchase intentions. Respondents were asked to respond based upon expectations in the first set of items, performance in the second set of items, and importance in the third set of items. The researchers found that service quality had a significant effect on customer satisfaction and purchase intentions.

The SERVQUAL scale has also been used to develop instruments to measure satisfaction. In 2011, Margaritis, Katharaki, and Katharakis used the five constructs of SERVQUAL as the basis of measuring satisfaction in the outpatient clinic setting. The researchers developed an initial 25-item survey combining the five constructs of SERVQUAL with satisfaction related items. After testing, analysis, and purification, the survey resulted in 23 items that loaded into seven constructs: satisfaction, access and convenience, customization, reliability, doctor's attention, assurance, and loyalty. All four of the initial survey questions from the tangible construct of SERVQUAL loaded into the access and convenience construct and were the only four items in the final construct. The researchers also conducted Fischer exact tests and found that access and convenience, doctor's attention, and assurance were all significantly associated with overall satisfaction.

While not directly referring to the scale as a satisfaction scale, McDonald, Sutton, and Milne (1995) used the SERVQUAL instrument to develop TEAMQUAL. The researchers refer to TEAMQUAL as a service quality scale for the professional sport

setting; however, the scale actually measures service satisfaction. McDonald et al. (1995) created a 39-item survey based upon the five constructs of SERVQUAL to be administered in the NBA setting. What makes the TEAMQUAL scale a satisfaction scale rather than a quality scale is the way in which response options were given. In the SERVQUAL scale, responses were given on a seven-point scale ranging from "Strongly Agree" (7) to "Strongly Disagree" (1) with no labels for scale points 2 through 6 (Parasuraman et al., 1988). In the TEAMQUAL scale responses were given on a seven-point scale ranging from "Fails to Meet Your Expectations" (1) to "Far Exceeds Your Expectations" (7) with the middle rating of 4 meaning "Met Your Expectations" (McDonald et al., 1995). The comparison of results to expectations is a primary method for measuring satisfaction.

Facility Evaluation

The physical environment is extremely influential in the successful and efficient operation of an organization. The modification of the physical environment can help an organization reach their desired efficiency (Amarantunga & Baldry, 2000). The ability to effectively manage a facility, and to evaluate and improve the management of a facility, is predicated on the understanding of the quality and condition of the facility (Lavy, Garcia, & Dixit, 2010). Therefore, 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).

Douglas (1996) asserts that when assessing the importance of building performance, it is necessary to utilize both the inter-building and intra-building perspectives. The inter-building assessment is an evaluation in which a particular facility is evaluated against other comparable facilities. Intra-building evaluation involves assessing the facility on its own, based on its own performance. The key to evaluating the effectiveness of a facility in a comprehensive manner is using appropriate performance metrics. Amaratunga et al. (2000) argue that performance measurement provides much-needed direction to management for decision making and provide the organization with a tool to enhance organizational performance. Performance measurement provides an organization with opportunities to examine past and present functionality, and to develop future strategies for the optimal operation of the organization and the fulfillment of its strategic goals (Lebas, 1995).

Major facility performance measurement practices include benchmarking, a balanced scorecard approach, post occupancy evaluation, and measurement through metrics of key performance indicators (KPIs) (Levy, Garcia, & Dixit, 2010). While benchmarking, a balanced scorecard approach, and post occupancy evaluation all have value as performance metrics, the establishment of KPIs is often a precursor to any of the other evaluation methods. Cable and Davis (2004) argue that measuring performance through the establishment of KPIs assists managers when making important strategic decisions. The development of performance metrics includes examining all relevant indicators of a facility's performance and it is of tremendous importance to identify a set of KPIs that express the performance of the facility in a holistic manner. Performance metrics evaluate long- and short-term finance and performance-related goals. These

evaluations are vital for a healthy relationship between the consumer and the facility (Baldwin et al., 2000).

A total of 49 sources, including 12 from sport and entertainment facility management, were identified. From these sources, 22 key performance indicators were identified encompassing three categories: functional indicators, financial indicators, and aesthetic indicators. Both the athletic facility management literature and the facility management literature outside of the athletic setting produced similar indicators of building performance. The most significant differences between the two bodies of literature is the quality of the measurement tools and the depth in which the indicators are examined. The athletic facility management literature is lagging behind in both areas.

Functional Indicators

The identified sources produced 14 functional indicators. A comparison of functional indicators found in the athletic facility management literature and functional indicators found in the facility management literature shows some overlap in indicators while also producing several unique indicators. A complete list of functional indicators found in the facility management literature can be found in Table 2 and a complete list of functional indicators found in the sport facility management literature can be found in Table 3.

A total of 6 of the 14 functional indicators namely safety, security, accessibility, space, parking, and indoor environmental quality were identified in both sets of literature. Safety indicators are defined as measures taken to prevent unintentional acts of harm within the facility. Several different measures of safety were identified in the literature including differences between the athletic and non-athletic facility management literature.

In the general facility management literature, Epstein (2001) called for measuring safety as a function of the number of accidents occurring in the facility in a given time period. 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 work days/hours to accidents. The athletic facility management literature also identified the number of incidents as a measure, but also included 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 within the facility. Within the athletic facility management literature, Hall et.al. (2010) focused on the training of facility managers and employees on how to prevent security breaches. Similarly, in the general facility management literature, Hammond et.al. (2005) suggest using threat and risk assessments to engage managers in the security process. Additionally, Baldwin et.al. (2001) examine security as a function of the number of security incidents in a given time period.

Accessibility is another indicator found in both subsets of the literature. Accessibility is defined as the ease of access to the facility and the ease of access to appropriate areas within the facility. Accessibility includes the ease of access for both able-bodied and disabled persons. The literature is consistent in using Likert scales to assess the perceived ease of access to and through facilities. The use of Likert scales to assess accessibility is best exemplified by Mahoney and Pastore (2014) in athletic facility management and Sanoff (2001) in general facility management.

Space is KPI identified in both subsets of the literature and is defined as the utilization and adequacy of the available space in the facility. Both subsets of the

literature have examined the utilization and adequacy of space in similar manners. Judge et.al. (2015) and Petersen (2013) examined athletic facility space adequacy as a function of the total area of the facility in ft^2 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^2 to the population of the community the library serves. Additionally, Fowler et.al. (2005) outlined several Likert scale measures for the utilization and adequacy of workspaces. Similar to indoor space, space for parking is another KPI identified in both subsets of the literature. 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).

The final functional indicator identified in both subsets of the literature is indoor environmental quality. As the name suggests, this is defined as the quality of the facility's indoor environment. This includes noise, light, smell, temperature, humidity, and cleanliness. While the indicator being assessed is similar between the two subsets of the literature, the methods of assessment are quite different. Within the general facility management literature, Pati et.al (2009) outline several direct measures of lighting and air quality; Jasch (2000) provides measurements of noise; and the IFMA (2008) gives examples of cleanliness measures. In the sport and entertainment facility literature, these 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 were the most significant absence in the athletic facility management literature. Within the literature there are two different physical condition indicators. The first is a quantitative

measure known as the Building Performance Index (BPI). BPI gives a score of the condition and performance of a facility on a 100-point scale. Both Pati et.al. (2009) and Augenbroe and Park (2005) advocate 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 condition of a facility. These evaluations can come in the form of checklists such as the evaluation provided by the IFMA (2008)). These evaluations of the physical condition of a facility would be of great benefit in the sport and entertainment facility management field.

In addition to the similarities to the rest of the facility management literature, the athletic facility management literature identified three indicators as distinctive from facilities in general with seating, equipment, and technology as key functional indicators. Seating is defined and measured as the seating capacity of the facility (Dymecki, 2014) and the comfort of the available seating (Biscaia, 2015). While a focus on seating is relatively unique to the athletic setting, Presier and Wang (2006) brought up the availability of seating areas for reading in a library. Equipment is defined as the equipment available for the use of participants and spectators. Equipment as a KPI for athletic facilities is highlighted by Judge et.al. (2015) and their descriptions of the available equipment in strength and conditioning facilities. Technology as a KPI is defined as technological features that enhance the experience of spectators, participants, and staff. Mahoney and Pastore (2014) used a Likert scale to evaluate the use of technology in a large arena. It is noteworthy that the facility management literature did not identify equipment and technology as key indicators although Preiser and Wang (2006) did discuss the number of books a library could hold.

Table 2
Facility Management Functional Indicators

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

Table 3
Sport Facility Management Functional Indicators

Indicator	Description	Measurement	Sources
Seating	Seating Capacity The comfort level of the spectator seating.	Total number of seats Size of seats in inches, Likert Scale	Dymecki, 2014; Newell, 2004 Biscaia, 2015; Newell, 2004; Palmero, 2015
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 2010; Palmero, 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, 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, 2014; Neff, 2000
Indoor environmental quality	Includes noise, light, smell, cleanliness, temperature, humidity	Likert Scale	Biscaia, 2015; Mahoney 2014; Neff, 2000; Newell, 2004; Palmero, 2015
Space	The total area available for use.	$Ft.^2$, Number of participants able to use the facility at one time, number of facilities within a single organization, Likert scale for adequacy	Dymecki, 2014; Judge 2015; Mahoney, 2014; Neff, 2000; Neff, 2004; Petersen, 2013
Equipment	The equipment available for the use of participants and/or spectators	Total number of different types of equipment	Judge, 2015; Newell, 2004
Parking	The available parking for spectators, participants, and staff	Number of spaces, distance of parking from venue, Likert Scale	Mahoney, 2014; Palmero, 2015
Technology	The technological features to enhance the experience of spectators, participants, and staff	Likert Scale	Mahoney, 2014

Financial Indicators

Six financial indicators were identified in the 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 subsets of literature. This was expected as these are the two most common financial factors associated with facility management. Capital costs are 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 examined, encompassing both subsets of the literature, capital costs were expressed as a total dollar amount (Epstein, 2001; Baldwin, 2001; Jasch, 2000, Neff, 2004). Operating costs are defined as all costs related to the operation of the facility. Within the general facility management literature, operational costs are well defined and well discussed. The International Facility Management Association (2008) outlined four main categories of operational costs: utilities, maintenance, janitorial, and human resources. These categories are supported by the rest of the body of literature and are all measured as a total dollar amount (Epstein, 2001; Baldwin, 2001; Jasch, 2000). The sport and entertainment facility management literature has focused less on operational costs. Only one study, Neff (2004), discussed operating costs and failed to discuss utilities as one of the sources of the costs.

While the similarities between the two subsets of the literature are easily identifiable and expected, the differences between the two bodies of literature are quite noteworthy. The sport facility management literature identified revenue generation as a key financial indicator; however, this was not found in the rest of the general facility literature. Revenue generation is defined as the revenue generated from the use of the facility. In sport management, facilities are often viewed as a primary revenue stream

through ticket sales and usage fees. Maxcy and Larson (2015) discuss the potential for revenue generation from the construction of a new football stadium. While many of the world's buildings are not built with revenue generation in mind, the lack of research into the revenue generation capabilities of non-sport facilities is surprising and necessitates further inquiry.

Three indicators; current replacement value, maintenance efficiency, and churn rate; were identified in the facility management literature, but not in the athletic setting. Current replacement value is defined as the total cost required to restore a facility to its original condition. This includes full replacement cost of the building, utility systems, and grounds, but does not include the contents of the facility (IFMA, 2008). Current replacement value is a KPI that the athletic facility management field should use as a benchmark. Pati (2009) 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 BPI. This is another area for sport facility management to begin examining. Churn rate is an indicator of employee and equipment turnover. It is defined as a percentage of total employees or equipment that must be replaced within a given time frame, typically a year (Baldwin, 2001). Churn rate is a KPI that could be of great significance to sport facility managers when analyzing the operating budgets of their facilities as replacing equipment is a significant part of this process. A complete list of financial indicators found in the facility management literature can be found in Table 4 and a complete list of financial indicators found in the sport facility management literature can be found in Table 5.

Table 4
Facility Management Financial Indicators

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

Table 5
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	$	Neff, 2004; Newell, 2004; Bruning, 2016, Maxcy, 2015
Revenue Generation	The revenue generated from the use of the facility	$	Bruning, 2016; Maxcy, 2015

Aesthetic Indicators

Two aesthetic indicators were identified in the literature; general appearance and facility decorations. The general appearance of the facility is found in both subsets of the literature and is defined as the exterior and interior visual qualities of the facility and the visual stimulation that the facility provides. In the general facility management literature, Preiser and Wang (2006) assessed facility appearance using a Likert scale to measure opinions of overall design concept, site design, and attractiveness of both the exterior and interior of the facility. Sanoff (2001) also used a Likert scale to assess the appearance of facilities. While also assessing the visual appearance of the exterior and interior of the facility on their own merits, the study also examined how well the facility fit in with its surroundings to make an aesthetically pleasing environment. Within the sport and entertainment facility management literature, Mahoney and Pastore (2014) and Biscaia (2015) both discuss the importance of creating a visually appealing environment with Mahoney and Pastore evaluating the appearance of facilities using a Likert scale. In addition to the general appearance of the facility, both Mahoney and Pastore, and Biscaia discuss facility decorations as an important indicator. The ability of pictures, memorabilia, and promotional items to elicit emotional responses is seen as an important factor in the functionality of an athletic facility. A complete list of aesthetic indicators found in the facility management literature can be found in Table 6 and a complete list of aesthetic indicators found in the sport facility management literature can be found 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	Preiser, 2006; Sanoff, 2001; Baldwin, 2000; Preiser, 1995

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 2014
Appearance	Exterior and interior visual qualities, visual stimulation of the facility	Likert Scale	Biscaia, 2015; Mahoney 2014

Atmospherics

Items designed to evaluate the atmosphere of a facility can be found in both the facility evaluation and service quality literature. Within the facility evaluation literature measures of lighting (Pati et al., 2009), air quality (Pati et al., 2009), noise levels (Jasch, 2000), and cleanliness (IFMA, 2008) can be found. In the service quality literature, items relating to atmosphere quality can be found in all of the scales, primarily under the construct of tangibles (Getty & Getty, 2003; Margaritis et al., 2011; Parasuarman et al., 1988; Teng et al., 2007), however, Getty and Getty (2003) also had items relating to atmosphere quality load into the reliability construct as well. While items relating to the facility atmosphere throughout the literature, the concept of facility atmosphere has a drastically different meaning within the sport field.

To address the difference in atmospheres between sports stadiums and nearly every other setting, Chen, Lin, and Chiu (2013) developed a sport stadium atmosphere scale. The researchers began with an initial 50 item scale that was tested in the Taiwanese Super Basketball League (SBL). 1,006 responses from fans attending 20 different games at two venues were collected and analyzed. The final scale consisted of 33 items loading 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 ordered factor was found to have a significant impact on fan satisfaction.

While the sport stadium atmosphere scale was developed to measure atmosphere quality and spectator satisfaction, there are several items that are also applicable to the athletes as well. 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 can all have an impact on player satisfaction as well as spectator satisfaction (Chen et al., 2013).

CHAPTER THREE

Methodology

Introduction

Measurement is a fundamental activity of science. In order to make sense of phenomena, researchers must develop a way to quantify or measure the things that are of interest to them (DeVellis, 2003). The process of quantifying a phenomenon requires the collection of data. One common method of data collection is through the conduction of surveys. Surveys can take a variety of forms. One common form of surveys used in research is known as a survey scale. Survey scales are collections of closed-response items used to measure abstract concepts known as constructs. 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 and Morgan, 2016).

Theoretical/Conceptual Framework

The construct being examined by this scale is student-athlete satisfaction with the quality of their competition facility. The conceptual framework for this scale was developed through the incorporation of three related components: satisfaction measurement, quality measurement, and elements of facility quality.

By the time student-athletes begin their collegiate playing experience, they have been exposed to numerous athletic facilities. Their experiences with previous facilities have shaped their opinions and expectations for the facilities that they use during their

collegiate experience. There are several theoretical approaches to the measurement of satisfaction. Due to the previous experiences of most student-athletes with other similar facilities, the most appropriate approach for measuring student-athlete satisfaction with their facilities is norms as comparative standards. The one deviation from the traditional norms as comparative standards approach employed in this scale was the use of hindsight expectations rather than foresight expectations. There were two reasons for using hindsight expectations in the development of this scale. The first was Kim, Magnusen, and Kim's (2014) assertion that hindsight expectations are the appropriate measure due to the emotional importance and uncertainty of outcome associated with the sport setting. These elements are associated with hindsight bias which makes hindsight expectations a better measure of the individuals' true expectations. The second reason for using hindsight expectations rather than foresight expectations was the difficulty in measuring foresight expectations. In this setting, it would have required measuring high school recruits' expectations of facilities prior to their first visit to a facility and then after using the facility while in college. This was not feasible considering that when the foresight expectations would need to be measured, the student-athlete would not yet have made a decision on where to attend college.

Due to the multi-dimensional nature of quality, there is a lack of consensus on how quality should be defined (Getty & Getty, 2003). Within the hospitality industry, the predominant instrument used to measure quality is the SERVQUAL instrument developed by Parasuraman et al. in 1988. The SERVQUAL instrument defines quality of service through five dimensions: tangibles, reliability, responsiveness, assurance, and empathy. These five dimensions were the most distinct dimensions from an original set of

ten dimensions. The last two dimensions contain items form seven of the original ten dimensions including security and access (Parasuraman et al., 1988). The SERVQUAL instrument is a tool to measure the quality of service in the hospitality industry; however, three dimensions of the instrument (tangibles, security, and access) deal directly with the quality of the facility (Parasuraman et al., 1988). While SERVQUAL is a scale designed to measure the quality of service, the dimensions of the SERVQUAL instrument have been shown to correlate to satisfaction in several studies (Margaritis, Katharaki, & Katharakis, 2011; Koo et al., 2009; Tsuji, Bennett, & Zhang, 2007). A model of SERVQUAL and its relationship to satisfaction can be found in Figure 1.

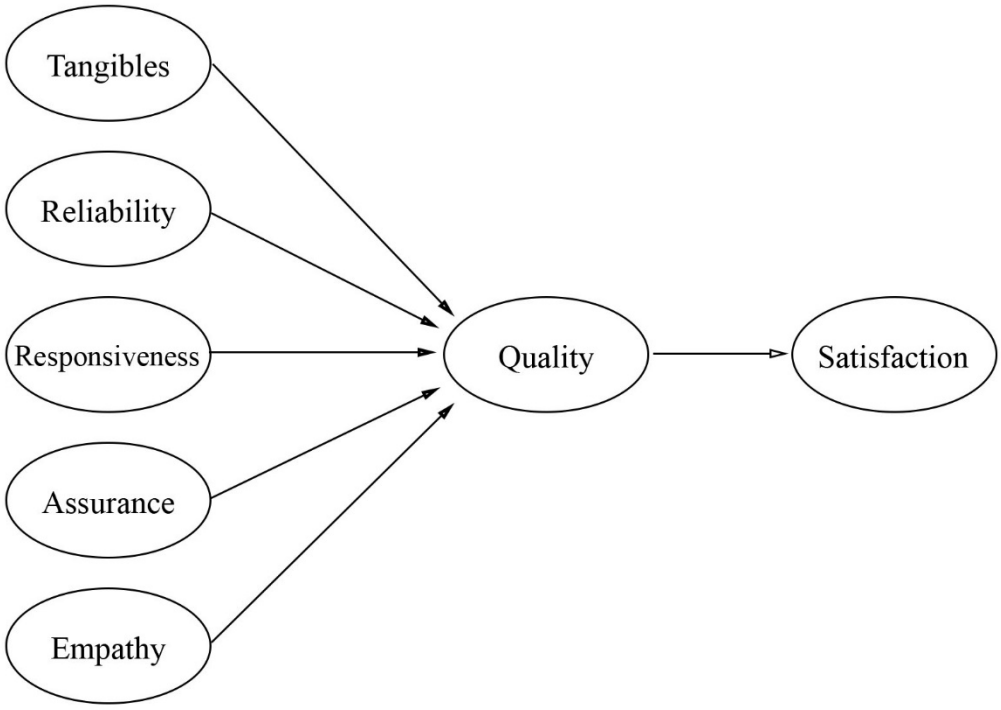

Figure 1. Relationship between SERVQUAL and satisfaction

The SERVQUAL model was created to measure service quality and its five dimensions are service related. To measure satisfaction with facility quality, it is necessary to define the dimensions of facility quality. Through the review of both sport based and non-sport based facility management literature, four dimensions of facility quality have been identified: functional, financial, atmospherics, and aesthetics. Functional aspects of facility quality include the physical condition of the facility, the maintenance of the facility, safety, security, accessibility, space availability, space efficiency, functionality, parking, equipment, and technology. Financial aspects of facility quality include capital cost, operational cost, and revenue generation. The dimension of atmospherics includes lighting, sound quality and acoustics, video boards, noise levels, seating capacity and attendance, and excitement and morale. Finally, aesthetic aspects include visual stimulation, cleanliness, color schemes, fit to surroundings, design quality, decorations, and interior finishes.

The theoretical model for this scale was to use the norms as comparative standards approach to satisfaction to evaluate the four identified dimensions of facility quality to ascertain student-athletes' satisfaction with their competition facilities. While financial indicators are one of the identified dimensions of facility quality, they impact the quality of the other dimensions. Therefore, financial aspects of facility quality are being conceptualized as moderators of the functional, aesthetic, and atmospheric aspects. The resulting model of student-athlete satisfaction with stadium facilities includes three dimensions with one moderator. A visual representation of this model can be found in Figure 2.

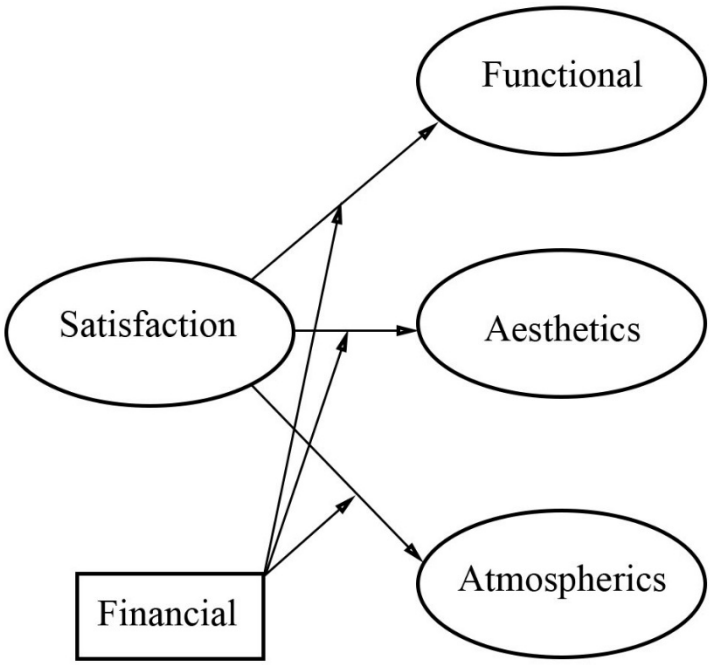

Figure 2. Theoretical model for student-athlete satisfaction with stadium facilities

Item Generation

To develop a relevant scale, items must be generated to measure the construct of interest. The development of relevant items stems from a focus on the conceptual framework of the study and the domains of the construct developed in the framework (Johnson and Morgan, 2016). For this study, items were developed to address the construct of satisfaction with a football stadium by focusing on the four domains identified in the conceptual framework: functional, financial, atmospherics, and aesthetics. Based upon the recommendations of Johnson and Morgan (2016), items were developed to be objective, concrete and precise, brief, clearly worded, and focused on a single idea.

The first group of items developed were the items designed to assess the functionality dimension of stadium satisfaction. This group included items 1-33. These

items were developed from the modification of items in SERVQUAL (Parasauraman et al., 1988) and Teng et al.'s (2007) hospital surgical facility scale. Items were modified to assess stadium facilities rather than hospitals or other types of facilities. Additional items were self-developed by the authors to assess other functional elements of stadium satisfaction as identified in the facility management literature.

Next, items 34-43 were developed to assess the atmospherics dimension of stadium satisfaction. These items were primarily developed from Chen et al.'s (2013) stadium atmospherics scale. Two of the items in the atmospherics dimension were self-developed by the authors to assess additional atmospheric elements identified in the sport facility management literature.

Finally, a group of items were developed to assess the aesthetic dimension of stadium satisfaction. These items were developed through the modification of items in SERVQUAL (Parasauraman et al., 1988) and Teng et al.'s (2007) hospital surgical facility scale. As with the functional items, these items were modified to assess stadium elements rather than other types of facilities. The items assessing aesthetics were items 44-54. Additionally, three demographic items were added to obtain respondents' years with their program, playing time, and race. A complete list of initial survey items can be found in Appendix A.

Development of Response Scale

One of the most important factors in the development of a survey response scale is creating a response scale that gauges the construct being measured (Johnson and Morgan, 2016). While SERVQUAL serves as a theoretical basis for the development of this scale, SERVQUAL was developed to measure perceived service quality not

satisfaction. (Parasuraman, 1988). Due to this difference, using the seven-point scale ranging from “Strongly Agree” (7) to “Strongly Disagree” (1) used in SERVQUAL (Parasuraman, 1988), is not appropriate for measuring satisfaction. To ensure that the response scale is appropriate for gauging satisfaction, a seven-point scale was developed from the TEAMQUAL scale (McDonald et. al., 1995) to reflect the construct of satisfaction. Satisfaction, as conceptualized in the norms as comparative standards perspective, is the difference between expectations based upon previous experiences with similar products and the experience with the focal product (Cadotte et. al., 1987). For this survey the focal product is the student-athlete’s home stadium. For each item in the scale, respondents will be asked “when compared to your expectations for a college football stadium, Stadium XYZ…” The respondents will then respond using the following seven points: “Greatly Underperforms Expectations” (1), “Underperforms Expectations” (2), “Somewhat Underperforms Expectations” (3), “Meets Expectations” (4), “Somewhat Exceeds Expectation” (5), “Exceeds Expectations” (6), “Greatly Exceeds Expectations” (7). The use of an odd number response scale is appropriate because the middle point is representative of the status quo, “Meets Expectations” (Johnson & Morgan, 2016).

Survey Scale Review

As one of the final steps in the survey scale development process, Johnson and Morgan (2016) suggest that the instrument pass through several types of review. The first review recommended is review by subject matter experts. This review is intended to provide feedback about the congruity between the survey items and the construct being examined by the survey. The subject matter expert reviews should also examine the instrument for underrepresentation or overrepresentation of facets of the construct within

the survey. This review provides content validity evidence about the inferences that are made based upon the survey results. For the subject matter expert review of this scale, the instrument was reviewed by a sport management professor at a large private university with expertise in facility management and a sport researcher with over 15 years of experience as a collegiate football coach.

The second type of review recommended by Johnson and Morgan (2016) is review by a survey methodologist. This review is intended to provide feedback about the survey items, the response scale, and the formatting of the instrument. The survey methodologist that reviewed this instrument is a professor at a large private university and has published extensively in the area of survey scale development. The survey methodologist review was completed as a two-step process the first step of the editorial review being completed after item and response scale generation and the second step being completed after formatting for Teleform.

The next type of review recommended by Johnson and Morgan (2016) is an editorial review. This review is intended to confirm the clarity of the survey items, remove any errors, and ensure the professional look of the instrument. The editorial review of this instrument was completed by a sport management professor at a large private university with an undergraduate degree in English literature and extensive experiences as a journal editor. As was done with the survey methodologist review, the editorial review was completed as a two-step process the first step of the editorial review being completed after item and response scale generation and the second step being completed after formatting for Teleform.

The final type of review recommended by Johnson and Morgan (2016) is a bias review. This review is completed to ensure that the participants' responses reflect the intent of the instrument and not their reactions to offensive or stereotypical language contained within the survey. The bias review should be completed by individuals that are representative of the focus of the survey. For this instrument, the bias review was conducted by two sport management graduate students that recently completed their eligibility as NCAA football student-athletes. Minor editorial changes were made as a result of the review process.

Pilot Study

Another aspect of the review process for this study was conducting a pilot study. Based upon the recommendation of Johnson and Morgan (2016) to conduct pilot studies in a context similar to the planned administration, the pilot for this study was conducted with current students from a large private university. The surveys were administered to the students in a group setting using the Teleform paper instruments.

The purpose of the pilot study was to gather feedback about the instrument such as item clarity, survey content, timing, and data collection issues. In the pilot study, participants were asked to complete both the survey and a brief questionnaire about the survey. Along with the completion of the survey, participants were asked to identify any items that were unclear, any difficulty understanding the response scale, any aspects of satisfaction with the facility that they believed to be missing from the survey, and the amount of time it took for them to complete the surveys. Once the surveys were completed the surveys were analyzed for missing or unusual responses, examined for any issues with the Teleform administration, and the responses to the feedback questionnaire

were cataloged and addressed. The pilot study confirmed that the survey was an acceptable length as most respondents completed the survey in 8-10 minutes. Using the feedback from the pilot study, the instrument was edited for minor grammatical errors and prepared for distribution.

Data Analysis

The data analysis for this study consisted of two separate factor analyses: exploratory factor analysis (EFA) and confirmatory factor analysis (CFA). These analyses were conducted using randomly assigned sub-samples from the data set.

Sample Size

Factor analysis is a mathematically complex test requiring a great deal of information to yield reliable and stable results (Johnson & Morgan, 2016). This means that the sample for a study utilizing factor analysis must be very large; however, there is not a universally accepted guideline for minimum sample sizes. Crocker and Algina (2006) recommended a minimum of 100 respondents and 10 respondents per item. Tabachnick and Fidell (2013) recommended a minimum of 300 respondents with 500 to 1,000 respondents being preferable. In order to generate a large sample size, this study recruited ten collegiate football teams each consisting of 70 to 125 players. This resulted in a sample size of 779 total respondents. This allowed for separate samples of 350 and 429 respondents each for EFA and CFA respectively.

Factor Analysis

Exploratory factor analysis was conducted to identify the underlying factor structure of the data set. While a theoretical/conceptual model for the facility satisfaction construct has been proposed for this study, EFA was used to explore the factor structure without imposing any preconceived structure on the outcome (Child, 1990). Through EFA, the number of latent dimensions within the construct were determined along with the variables comprising each dimension. Variables were also examined for extreme collinearity and items not providing unique information were removed from the survey.

Using the model created from the EFA, CFA was used to test the relationship between the variables and their underlying latent dimensions. CFA differs from EFA in that it requires an a priori model to be tested. By using an a priori model, the researcher was able to impose constraints on the model and use structural equation modeling (SEM) to determine the adequacy of model fit to the data. There are several different measures of model fit that can be examined. A chi-squared value that is close to zero is indicative of good model fit (Suhr, 2006). A Comparative Fit Index (CFI) approaching one and a Root Mean Square Error of Approximation (RMSEA) value approaching zero are also indicative of good model fit (Hu & Bentler, 1999).

IRB Review

This study was reviewed and approved by the Baylor University institutional review board (IRB). This study was submitted as an exempt research project due to there being minimal risk to the subjects and there being no identifiers being collected. Participants completed an informed consent form which was kept separate from the

survey instrument and all surveys are kept in a locked filing cabinet by the primary researcher.

CHAPTER FOUR

Results

Description of the Sample

Football student-athletes were recruited from ten universities across the United States. Of these universities, three were members of NCAA Division III, three were members of NCAA Division II, and four were members of NCAA Division I. Three of the universities were located in the midwestern United States, three were located in the southwestern United States, two were located in the southeastern United States, and two were located in the Rocky Mountain region of the United States. Six of the universities were private institutions and four of the universities were public institutions.

A total of 779 football student-athletes from the ten institutions completed the survey instrument. Of the 779 respondents, 291 (37.4%) competed for an NCAA Division III institution, 233 (29.9%) competed for an NCAA Division II institution, and 255 (32.7%) competed for an NCAA Division I institution. A total of 313 (40.2%) of the respondents had completed one season of competition at their current institution, 148 (19.0%) had completed two seasons, 143 (18.4%) had completed three seasons, 153 (19.7%) had completed four or more seasons, and 22 (2.8%) declined to indicate the number of seasons completed at their current institution. Within the sample 232 (29.8%) of the respondents reported being starters for their teams, 157 (20.2%) reported being reserves with significant playing time, 179 (23.0%) reported being reserves with limited playing time, 187 (24.0%) reported being scout team players, and 24 (3.1%) declined to indicate the amount of playing time received. The racial demographic breakdown of the

respondents was 49.2% white, 35.2% African American, 5.8% Hispanic, 0.9% Asian or Pacific Islander, 0.5% Native American, 6.3% other race, and 2.2% declined to indicate their race. Complete demographic information can be found in Table 8.

Table 8
Demographics of the Sample

Demographic Characteristic	*n*	%
NCAA Affiliation		
Division I	255	32.7
Division II	233	29.9
Division III	291	37.4
Years in Current Program		
One	313	40.2
Two	148	19.0
Three	143	18.4
Four or more	153	16.7
No response	22	3.0
Playing Time		
Starter	232	29.8
Reserve significant playing time	157	20.2
Reserve limited playing time	179	23.0
Scout team	187	24.0
No response	24	3.1
Race		
White	383	49.2
African American	274	35.2
Hispanic	45	5.8
Asian or Pacific Islander	7	0.9
Native American	4	0.5
Other	49	6.3
No response	17	2.2

Descriptive Statistics

Mean values and standard deviations were computed for each of the 54 variables associated with the survey content on the entire sample. Mean values ranged from 3.49 to 5.27. Ten of the 54 items had a mean value of less than 4.00, indicating the factor did not

meet expectations. Of these ten factors, “The amount of parking available for players at Stadium XYZ…(V27)” (*M* = 3.49, *SD* = 1.69) and “The Wi-Fi connectivity in Stadium XYZ…(V24)” (*M* = 3.56, *SD* = 1.76) had the lowest mean values. Five of the 54 items had mean values of 5.00 or greater, indicating the factor more than somewhat exceeds expectations. Of these five factors, “The distance between our locker room and the playing field in Stadium XYZ…(V15)” (*M* = 5.27, *SD* = 1.51) and “The distance between our locker room and the athletic training room in Stadium XYZ…(V17)” (*M* = 5.15, *SD* = 1.58) had the highest mean values. A complete listing of mean values and standard deviations can be found in Appendix B.

Exploratory Factor Analysis

An exploratory factor analysis (EFA) was conducted using a randomly selected sub-sample of 350 respondents from the initial 779 total respondents. This analysis revealed six latent factors. Further EFAs were conducted until all factor loadings were above 0.400 on a single factor. This resulted in the removal of seven response items. Three of the seven items were removed for failure to load above 0.400 and four items were removed for cross loading. The seven items removed from the scale are noted in Table 9. There were 12 response items that loaded into the first factor with a Cronbach’s alpha coefficient of 0.954. These items were all associated with the general functionality of the stadium and the factor was labeled “Functional.” Six of the response items loaded into the second factor with a Cronbach’s alpha coefficient of 0.923. These items were all associated with ease of movement throughout the stadium and the factor was labeled “Convenience.” Eight of the response items loaded into the third factor with a Cronbach’s alpha coefficient of 0.897. These items were all associated with game day activities and

the factor was labeled “Game Day.” Six of the response items loaded into the fourth factor with a Cronbach’s alpha coefficient of 0.869. These items were all associated with safety, security, and connectivity and the factor was labeled “Safety Security.” Four of the response items loaded into the fifth factor with a Cronbach’s alpha coefficient of 0.926. These items were all associated with the public address system and video boards in the stadium and the factor was labeled “Audio Video.” The remaining 11 response items loaded into the sixth factor with a Cronbach’s alpha coefficient of 0.963. These items were all associated with aesthetic indicators of the stadium and the factor was labeled “Aesthetics.” All factor loadings can be found in Table 10.

Table 9
Removed Response Items

Var	Item
V1	The quality of the playing surface at Stadium XYZ… Failed to load above 0.400
V14	The condition of the route from our locker room to the playing field in Stadium XYZ… Cross loaded
V23	The technology available in Stadium XYZ… Failed to load above 0.400
V28	The amount of parking available for staff at Stadium XYZ… Cross loaded
V34	The lighting in Stadium XYZ… Failed to load above 0.400
V43	The level of excitement during our games in Stadium XYZ… Cross loaded
V54	The cleanliness of the athletic training room in Stadium XYZ… Cross loaded

Table 10
EFA Factor Loadings

Item	Var	1	2	3	4	5	6
The maintenance of the playing surface at Stadium XYZ…	V2	0.402					
The functionality of the lockers in Stadium XYZ…	V3	0.938					
The quality of the lockers in Stadium XYZ…	V4	0.938					
The maintenance of the lockers in Stadium XYZ…	V5	0.916					
The quality of the restroom facilities in Stadium XYZ…	V6	0.718					
The maintenance of the restroom facilities in Stadium XYZ…	V7	0.701					
The quality of the shower facilities in Stadium XYZ…	V8	0.711					
The maintenance of the shower facilities in Stadium XYZ…	V9	0.75					
The size of our locker room in Stadium XYZ…	V10	0.891					
The layout of our locker room in Stadium XYZ…	V11	0.754					
The size of the athletic training room in Stadium XYZ…	V12	0.701					
The availability of medical equipment in Stadium XYZ…	V13	0.584					
The distance between our locker room and the playing field in Stadium XYZ…	V15		0.661				
The condition of the route from our locker room to the playing field in Stadium XYZ…	V16		0.67				
The distance between our locker room and the athletic training room in Stadium XYZ…	V17		0.933				
The condition of the route from our locker room to the athletic training room in Stadium XYZ…	V18		0.954				
The distance between the athletic training room and the playing field in Stadium XYZ…	V19		0.965				
The condition of the route from the athletic training room to the playing field in Stadium XYZ…	V20		0.675				
The distance between our locker room and the media room in Stadium XYZ…	V21			0.484			

(Continued)

Item	Var	1	2	3	4	5	6
The condition of the route from our locker room to the media room in Stadium XYZ…	V22			0.414			
The amount of general parking available at Stadium XYZ…	V26			0.714			
The amount of parking available for players at Stadium XYZ…	V27			0.621			
The amount of parking available for spectators at Stadium XYZ…	V29			0.717			
The noise level during games in Stadium XYZ…	V39			0.605			
The spectator capacity of Stadium XYZ…	V40			0.557			
The spectator attendance for our games in Stadium XYZ…	V41			0.642			
The Wi-Fi connectivity in Stadium XYZ…	V24				0.436		
The phone service in Stadium XYZ…	V25				0.577		
My feelings of safety while in Stadium XYZ…	V30				0.732		
My feelings of being free from unintentional harm such as slips or falls while in Stadium XYZ…	V31				0.683		
My feelings of security while in Stadium XYZ…	V32				0.757		
My feelings of being free from intentional acts of harm such as physical attacks while in Stadium XYZ…	V33				0.778		
The size of the video board(s) in Stadium XYZ…	V35					0.893	
The picture quality on the video board(s) in Stadium XYZ…	V36					0.928	
The clarity of the sound through the PA system in Stadium XYZ…	V37					0.811	
The volume of the sound through the PA system in Stadium XYZ…	V38					0.683	
The proximity of fans to the playing field in Stadium XYZ…	V42						0.623
The architectural design of Stadium XYZ…	V44						0.689
The matching of Stadium XYZ's style to the surrounding area (architecture, landscape, building materials, etc.) …	V45						0.659
The quality of the materials used to finish the floors, walls, and ceilings in Stadium XYZ…	V46						0.832

(Continued)

Item	Var	1	2	3	4	5	6
The visual appeal of the materials used to finish the floors, walls, and ceilings in Stadium XYZ…	V47						0.811
The color scheme of Stadium XYZ…	V48						0.928
The color scheme of our locker room in Stadium XYZ…	V49						0.832
The attractiveness of the decorations in Stadium XYZ…	V50						0.853
The appropriateness of the decorations in Stadium XYZ…	V51						0.815
The general cleanliness of Stadium XYZ…	V52						0.764
The cleanliness of our locker room in Stadium XYZ…	V53						0.558
Cronbach's Alpha Coefficient		0.954	0.923	0.897	0.869	0.926	0.963

Confirmatory Factor Analysis

Confirmatory factor analysis (CFA) was performed on the six-factor model identified by the EFA. The results of the CFA revealed a good fit to the data [χ 2 (1388) = 5516.73, $p < .001$, CFI = .89, TLI = .88, RMSEA = .08]. The CFA indicated acceptable factor loadings with all standardized factor loadings being above 0.600 (Hair, Anderson, & Tatham, 1987). Cronbach's alpha and McDonald's omega coefficients were all above 0.850, indicating good reliability (Dunn, Baguely, & Brunsden, 2014). Complete CFA factor loadings, Cronbach's alpha, and McDonald's omega coefficients can be found in Table 11. Additionally, all six factors were significantly correlated to each other. Correlations of the six factors can be found in Table 12.

Table 11

Factor Loadings, Cronbach' Alpha Coefficients, and McDonald's Omega Coefficients

Item	Var	Factor	Unstandardized Est.	Unstandardized *S.E.*	Standardized Est.	Standardized *S.E.*
The maintenance of the playing surface at Stadium XYZ…	V2	Functional	1.000	0.000	0.727	0.031
The functionality of the lockers in Stadium XYZ…	V3	Cronbach's α 0.939	1.286	0.070	0.877	0.013
The quality of the lockers in Stadium XYZ…	V4	McDonald's ω 0.964	1.294	0.071	0.881	0.012
The maintenance of the lockers in Stadium XYZ…	V5		1.170	0.065	0.820	0.017
The quality of the restroom facilities in Stadium XYZ…	V6		1.206	0.067	0.838	0.016
The maintenance of the restroom facilities in Stadium XYZ…	V7		1.252	0.068	0.861	0.015
The quality of the shower facilities in Stadium XYZ…	V8		1.237	0.072	0.853	0.015
The maintenance of the shower facilities in Stadium XYZ…	V9		1.224	0.069	0.847	0.015
The size of our locker room in Stadium XYZ…	V10		1.208	0.072	0.839	0.017
The layout of our locker room in Stadium XYZ…	V11		1.227	0.072	0.848	0.017
The size of the athletic training room in Stadium XYZ…	V12		1.069	0.071	0.765	0.022
The availability of medical equipment in Stadium XYZ…	V13		1.128	0.069	0.798	0.022
The distance between our locker room and the playing field in Stadium XYZ…	V15	Convenience	1.000	0.000	0.829	0.018
The condition of the route from our locker room to the playing field in Stadium XYZ…	V16	Cronbach's α 0.923	1.097	0.032	0.890	0.015
The distance between our locker room and the athletic training room in Stadium XYZ…	V17	McDonald's ω 0.951	1.103	0.038	0.894	0.014
The condition of the route from our locker room to the athletic training room in Stadium XYZ…	V18		1.106	0.038	0.896	0.014
The distance between the athletic training room and the playing field in Stadium XYZ…	V19		1.082	0.034	0.881	0.013
The condition of the route from the athletic training room to the playing field in Stadium XYZ…	V20		1.037	0.042	0.853	0.021

(Continued)

Item	Var	Factor	Unstandardized Est.	*S.E.*	Standardized Est.	*S.E.*
The distance between our locker room and the media room in Stadium XYZ…	V21	Game Day	1.000	0.000	0.856	0.016
The condition of the route from our locker room to the media room in Stadium XYZ…	V22	Cronbach's α 0.887	1.029	0.027	0.875	0.015
The amount of general parking available at Stadium XYZ…	V26	McDonald's ω 0.944	0.997	0.035	0.854	0.017
The amount of parking available for players at Stadium XYZ…	V27		0.914	0.036	0.795	0.021
The amount of parking available for spectators at Stadium XYZ…	V29		0.929	0.032	0.806	0.019
The noise level during games in Stadium XYZ…	V39		0.940	0.037	0.814	0.021
The spectator capacity of Stadium XYZ…	V40		0.918	0.036	0.798	0.021
The spectator attendance for our games in Stadium XYZ…	V41		0.909	0.038	0.792	0.023
The Wi-Fi connectivity in Stadium XYZ…	V24	Safety Security	1.000	0.000	0.603	0.038
The phone service in Stadium XYZ…	V25	Cronbach's α 0.856	1.022	0.075	0.615	0.036
My feelings of safety while in Stadium XYZ…	V30	McDonald's ω 0.923	1.573	0.109	0.904	0.012
My feelings of being free from unintentional harm such as slips or falls while in Stadium XYZ…	V31		1.596	0.112	0.915	0.013
My feelings of security while in Stadium XYZ…	V32		1.607	0.111	0.920	0.012
My feelings of being free from intentional acts of harm such as physical attacks while in Stadium XYZ…	V33		1.542	0.111	0.889	0.013
The size of the video board(s) in Stadium XYZ…	V35	Audio Video	1.000	0.000	0.901	0.012
The picture quality on the video board(s) in Stadium XYZ…	V36	Cronbach's α 0.919	1.091	0.031	0.954	0.010
The clarity of the sound through the PA system in Stadium XYZ…	V37	McDonald's ω 0.958	1.032	0.026	0.920	0.009
The volume of the sound through the PA system in Stadium XYZ…	V38		1.016	0.027	0.911	0.011
The proximity of fans to the playing field in Stadium XYZ…	V42	Aesthetics	1.000	0.000	0.696	0.026
The architectural design of Stadium XYZ…	V44	Cronbach's α 0.952	1.272	0.053	0.852	0.014

(Continued)

Item	Var	Factor	Unstandardized Est.	*S.E.*	Standardized Est.	*S.E.*
The matching of Stadium XYZ's style to the surrounding area (architecture, landscape, building materials, etc.) …	V45	McDonald's ω 0.968	1.300	0.055	0.867	0.012
The quality of the materials used to finish the floors, walls, and ceilings in Stadium XYZ…	V46		1.428	0.058	0.933	0.007
The visual appeal of the materials used to finish the floors, walls, and ceilings in Stadium XYZ…	V47		1.371	0.058	0.904	0.010
The color scheme of Stadium XYZ…	V48		1.302	0.055	0.868	0.012
The color scheme of our locker room in Stadium XYZ…	V49		1.195	0.053	0.809	0.017
The attractiveness of the decorations in Stadium XYZ…	V50		1.387	0.060	0.912	0.009
The appropriateness of the decorations in Stadium XYZ…	V51		1.404	0.059	0.921	0.009
The general cleanliness of Stadium XYZ…	V52		1.250	0.055	0.840	0.016
The cleanliness of our locker room in Stadium XYZ…	V53		1.189	0.055	0.806	0.018

Note: p <.001 for all values

Table 12
Factor Correlations

Factor	Functional	Convenience	Game Day	Safety	Audio/Video	Aesthetics
Functional	-					
Convenience	0.551	-				
Game Day	0.501	0.378	-			
Safety	0.493	0.531	0.516	-		
Audio/Video	0.423	0.365	0.572	0.424	-	
Aesthetics	0.591	0.482	0.598	0.586	0.549	-

Note: p < .001 for all values

Financial Impacts

To address the impact of financial indicators on the model, correlations between the six factors in the model and four financial variables were analyzed. The four financial variables were football revenues, football expenses, total athletic revenues, and total athletic expenses. All financial data was retrieved from the Equity in Athletics Disclosure

Act database of the U.S. Department of Education. Analysis revealed positive correlations between all six factors and the four financial variables with three exceptions. Correlations between "game day" and football revenues, total athletic revenues, and total athletic expenses were negative. Correlations between the six factors and the four financial variables can be found in Table 13.

Table 13
Factor and Financial Correlations

Factor	FB Expenses	FB Revenues	Tot Expenses	Total Revenues
Functional	0.093	0.029	0.047	0.047
Convenience	0.117	0.114	0.119	0.121
Game Day	0.036	-0.037	-0.023	-0.023
Safety Security	0.165	0.134	0.146	0.146
Audio Video	0.264	0.213	0.223	0.223
Aesthetics	0.137	0.086	0.100	0.101

CHAPTER FIVE

Discussion

Final Model

The initial theoretical model proposed for the measurement of student-athlete satisfaction with stadium facilities was a three-factor model (functional, atmospheric, and aesthetic) with one moderator (financial). Exploratory factor analysis (EFA) reviled a six-factor model (functional, convenience, game day, safety security, audio video, and aesthetics) with one moderator (financial). The six-factor model with one moderator was validated using confirmatory factor analysis (CFA). A visual representation of this model can be found in Figure 3. In moving from the initial three-factor model to the final six-factor model, it is obvious that response items must have loaded into factors differently than what was initially expected. Additionally, seven of the original questionnaire response items did not load into any of the six new factors and were removed from the survey scale. This section will discuss the six new factors and their reorganization from the initial theoretical model.

The six factor model was found to have good reliability and model fit. When compared to the most commonly reported reliability measure, Cronbach's alpha, found in SERVQUAL and other scales developed from SERVQUAL (these measures can be found in Table 1) the alpha coefficients for this scale meet or exceed all nine studies in which alpha coefficients were reported. While the model fit values do not fall within Hu and Bentler's (1999) recommended guidelines for CFI, TLI, and RMSEA cutoff values, the guidelines presented by Hu and Bentler were not developed for and likely are not

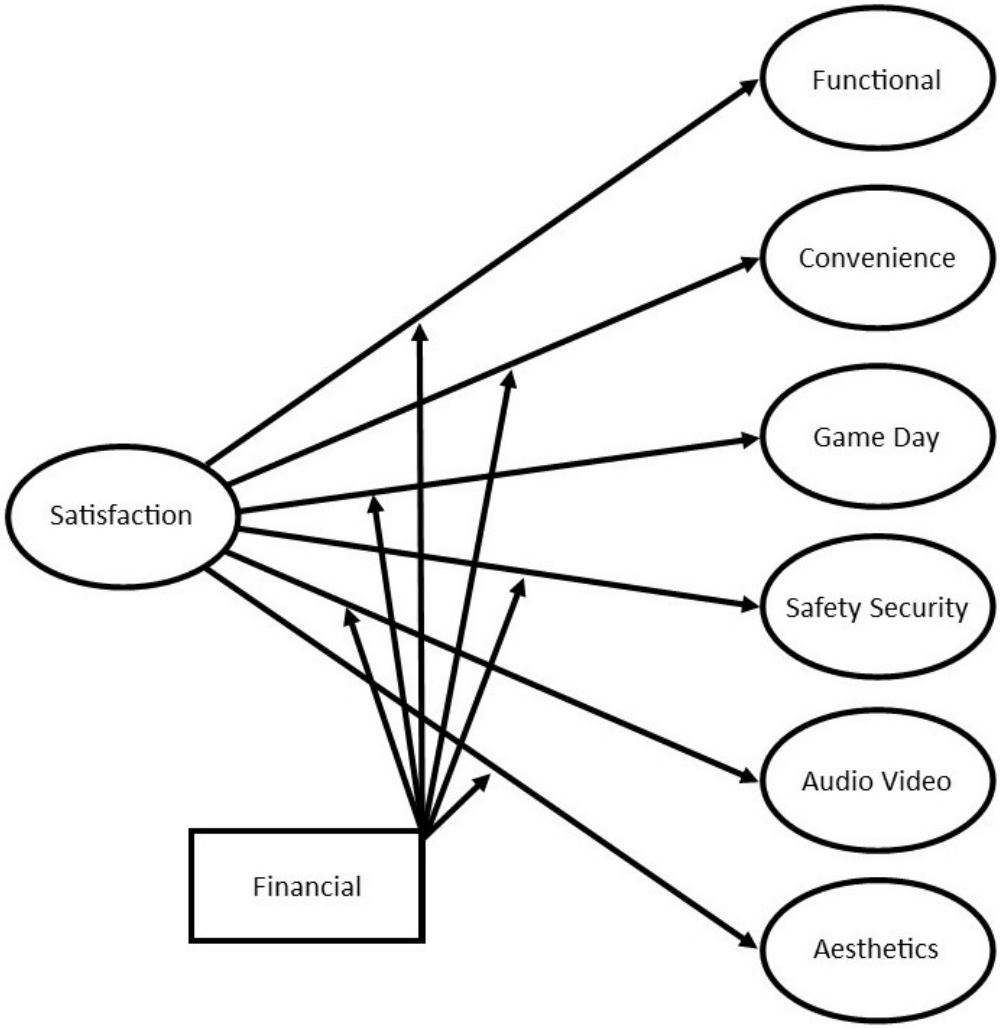

Figure 3. Final model for student-athlete satisfaction with stadium facilities

applicable to more complex models such as this. The scarcity with which model fit measures are reported in the previous studies combined with the superior reliability measures of this study and the small differences between the model fit measures form this study and the Hu and Bentler cutoffs, indicate that this model is at least on par with similar scales and likely superior to them.

The first factor identified by the EFA included items 2-13 and was labeled "functional." All 12 of these items were included in the initial "functional" factor from

the three-factor model. These factors all assess the size, quality, availability, or maintenance of different aspects of the stadium. The next factor identified by the EFA included items 15-20 and was labeled "convenience." All six of these factors were also included in the initial "functional" factor from the preliminary three-factor model. The six items in the "convenience" factor all assess the ability of student-athletes to move freely through the facility. Despite loading into separate factors, the loading of these items together is consistent with the literature used to create the initial model. In the SERVQUAL tool convenience related items loaded into the factor of "empathy" rather than the "tangibles" factor which was the primary basis of the development of the "functional" factor in the initial model (Parasuraman, 1988). Additionally, in their examination of service quality in hospital surgical centers, Teng et al. (2007) began with the five SERVQUAL dimensions and their analysis revealed "convenience and quiet" as one of six factors in their model. Teng et al. (2007) noted in their study that the factors "sanitation" and "convenience and quiet" in their model resemble the "tangibles" factor from the SERVQUAL model. In an examination of outpatient medical facilities, Margaritis et al. (2011) had a factor, "access and convenience," immerge from items originally intended to assess the "tangibles" factor from the SERVQUAL model. The consistency with which scales developed from the SERVQUAL model produce a convenience factor is indictive of content validity.

In addition to the "functional" and "convenience" factors, another factor, "safety security," was also comprised entirely of items from the initial "functional" factor from the three-factor model. The "safety security" factor consists of items 24 and 25 and items 30-33. Items 30-33 deal directly with feelings of safety and security while items 24 and

25 deal with cellular and wireless connectivity. These items loading together are possibly indicative of a connection between the student-athletes' feelings of safety and security to their feelings of being connected via devices. Research has shown that there is a connection between millennials' feelings of safety and security and their ability to stay connected via technology. In a 2016 study, Villena-Alvarez described WiFi connectivity as "the air to university life" and noted that interruptions to connectivity cause anxiety in college students. In a 2017 study commissioned by ADT Security, 90% of millennials reported that smartphones and smartwatches provide peace of mind while they are alone (Is Anxiety, 2017). Safety and/or security was included as an initial factor in two of the previous quality measurement studies, SERVQUAL (Parasuraman, 1988) and the Lodging Quality Index (Getty & Getty, 2003). In both studies safety and security items loaded into a factor with items assess the ability of employees to inspire confidence in the consumer and were relabeled "assurance" and "confidence" in the respective studies. As this scale is intended to focus solely on the facility and not the employees, it is logical that the safety and security items would separate themselves in a similar manner to the previous studies.

A fourth factor, "audio video," is composed of items 35-38, all of which were initially part of the "atmospheric" factor from the three-factor model. These four items assess the public address system and the video boards in the stadium. In Chen et al.'s (2013) sport stadium atmospherics scale, one of the ten factors of stadium atmosphere was "electronic device" and included music, acoustics, and video boards. It was initially expected that in a general stadium satisfaction scale, all the items developed from the stadium atmospherics scale would load together. These items, however, loaded in a

hybrid manner as the "audio video" factor separated from the initial "atmospherics" factor while other items stayed together.

The final two factors, "game day" and "aesthetics," were each formed from items from two of the initial three factors. "Game day" includes items 21-22, 26-27, and 29 from the initial "functional" factor, as well as, items 39-41 from the initial "atmospherics" factor from the three-factor model. This factor was labeled "game day" because all of these items are primarily only important on game days. Items 21 and 22 relate to the ability of players to access the media room which typically only happens after games. Items 26, 27, and 28 deal with parking which is more important during game days, and items 39-41 address the crowd, which is only present on game days. While these items were initially expected to load into different factors based upon the general facility management literature, their loading together is logical given the uniqueness of the sport setting. In the general facility management literature, the facilities being examined are used in relatively the same manner every day. In the sport setting, however, stadiums often function differently on game days than they do on any other day. It is common that only the head coach would use the media room during the week and players would speak to the media on the field after practice or in the locker room. The only time players would have large media availability, in the media room, would be after games. Also parking around stadiums is drastically different on game days than on non-game days. These types of changes in the functionality of a facility between an in-game and non-game use are not found in most non-sport facilities and thus are not represented in the general facility management literature. One would expect to find research on the differences between in-game and non-game uses of sport facilities within the sport

management literature; however, despite a great deal of discussion of the uniqueness of the sport setting (Baker, McDonald, & Funk, 2016; Hoye, Nicholson, & Smith, 2006), there is no research available regarding these differences. This is an area needing examination.

The final factor, "aesthetics," includes item 42, proximity of the fans to the playing field, from the initial "atmospheric" factor and items 44-53 from the initial "aesthetics" factor from the three-factor model. It was initially expected that the proximity of fans to the playing field would load with other items relating to the game day atmosphere due to the impact of fans' proximity on crowd noise; however, it seems logical that this item would load with the aesthetic items as the proximity of the fans to the playing field is a direct function of the stadium's design.

In totality, the final six-factor model closely aligns with the initial three-factor model. The differences in the two models are primarily the result of the initial "functional" factor being too broadly defined and splitting into smaller, more closely related factors and differences in the functionality of sport facilities from the functionality of other types of facilities. As discussed in the review of literature, technology was not a KPI discussed in the general facility management literature, but it was discussed by Mahoney and Pastore (2014) in their "sportsphere" study. This aligns with the separation of "audio video" as a unique factor. Despite being examined by both Mahoney and Pastore (2014) and Palmero and Price (2015), studies of parking in the sport context have never differentiated between game days and non-game days. While the concept of different parking experiences on game days and non-game days is logical, more research into the phenomenon is warranted.

These results demonstrate face, content, and construct validity. Face validity is a subjective measure of the extent to which a test measures the construct that it is intended. The items in this survey scale all logically assess student-athlete satisfaction with stadium facilities. Content validity refers to the extent to which items measure the domain of the construct that they are intended to measure. The factor loadings making logical sense throughout the survey is evidence of content validity. Construct validity is the extent to which inferences can be legitimately made based upon the results of a test. The fact that the items in this study loaded into factors as expected or closely aligned to what was expected combined with the moderate factor correlations is evidence of construct validity.

Financial Impact

To assess the impact of finances on student-athlete satisfaction with stadium facilities, correlations between four financial variables (football revenue, football expenses, total athletic revenue, and total athletic expenses) and the six factors from the final model were analyzed. As shown in Table 12, weak positive correlations were found between each of the four financial variables and five of the six factors. These positive, but weak correlations between the student-athlete satisfaction factors and the financial variables were expected. These correlations show that there is a positive relationship between finances and student-athlete satisfaction with stadium facilities, but it is by no means the only factor. Of the six satisfaction factors, “audio video” had the strongest correlations with the financial factors which is logical as video board size and public address system performance are often directly related to the size of the stadium and larger stadiums are more expensive. This is evidenced by 22 of the 25 largest video boards in

college football being in stadiums with a capacity of over 50,000 and 24 of the 25 are at institutions in Power 5 conferences (Foxsports, 2016). The "game day" and "functional" factors had the weakest correlations to the financial variables, with the "game day" factor having a weak positive correlation to football expenses and weak negative correlations to the other three financial variables. This shows that having a functional stadium and great game day experience for the student-athletes is not as limited by financial implications as one might expect. Numerous stadiums in FCS, Division II, and Division III such as Washington-Grizzly Stadium at the University of Montana, the Fargodome at North Dakota State, "The Jungle" at Pittsburg State, and Perkins Field at the University of Wisconsin Whitewater are known for having great game day atmospheres.

Managerial Implications

A valid and reliable tool to measure student-athlete satisfaction with stadium facilities has several important managerial implications. The first, and perhaps most obvious, managerial implication of this instrument is the ability of managers to have reliable information about their student-athletes' feelings towards their facilities. This information will allow coaches and administrators to make better informed decisions about their facilities with regards to the student-athletes. When planning a new facility or renovations to an existing facility, this instrument will aid in identifying aspects of the stadium that the student-athletes are not satisfied with and addressing these areas. Additionally, aspects of the facility that student-athletes are satisfied with can be preserved during a renovation or replicated in a new construction project.

Examples of addressing the shortcomings and preserving popular amenities in new or renovated stadiums can be found throughout college football. In the design of

McLane Stadium at Baylor University, the student section was placed directly behind the visiting team bench to improve the game day atmosphere. Additionally, a series of tunnels was included in the stadium to allow students easy access from the field to their seats in an effort to preserve and enhance the "Baylor Line" tradition (Newcomb, 2014). In 2017, Colorado State University-Pueblo added a 1,300 ft.^{2} video board to the ThunderBowl to "enhance the fans' game day experience" (Cervi, 2017). In 2017, Notre Dame completed a $400,000,000 renovation to Notre Dame Stadium. In completing this massive renovation, Notre Dame was careful to preserve the "rich tradition" of their home locker room and not make any substantial changes to that part of the facility (Campus Crossroads, 2018). The use of this survey instrument will enhance the ability of administrators to make these types of decisions with appropriate input from the student-athletes.

Beyond single institution managerial implications, this instrument can also be used to create benchmarks for facility amenities. Researchers can compare satisfaction scores from this instrument to objective data about the facilities to create benchmarks for what typically leads to satisfied student-athletes. For example, the distance from the locker room to the playing field can be objectively measured. These measurements can be compared to satisfaction score from this instrument to create benchmarks such as "a distance of less than *x* feet between the locker room and the playing field is typically satisfactory to student-athletes." The same can be done for numerous other items within this instrument including; the size of the locker room, athletic training room, and video board, the number of available parking spaces, and distances between other parts of the facility. Additionally, because this instrument was created to be generalizable to facilities

across all three NCAA divisions, the ability to create interdivisional and intradivisional benchmarks is present. In some instances, such as the distance between the locker room and the playing field, an interdivisional benchmark may be appropriate as this isn't likely to vary much between divisions. In other instances, such as the size of the video board, an intradivisional benchmark may be more appropriate as it is likely not appropriate to compare the size of video boards in Division I facilities to those in Division III facilities. The ability of administrators to compare results from their student-athletes and their facility to benchmarks of all collegiate stadiums and collegiate stadiums within their division will allow for better informed and more efficient decision making.

Another managerial implication of this study is the weak positive correlations between satisfaction factors and financial variables. These weak positive correlations show that while more money does have a positive correlation to student-athlete satisfaction with their facilities, it is still very possible to create quality facilities on a limited budget. This study shows that prioritizing where to spend money on facility projects may have the ability to maximize return on investment from a student-athlete satisfaction perspective. This has the potential to level the playing field among institutions with varying financial situations. With the massive differences in the budgets of college athletic programs, particularly in Division I, continuing to widen (Fulks, 2015), any avenue for minimizing or mitigating the effects of financial factors has the potential for significant impacts on college athletics. This aspect of the study represents an opportunity for further research with significant managerial implications.

Theoretical Implications and Future Research

There are also several theoretical implications and directions for future research based upon the findings of this study. The first direction for future research is to continue to collect data with the instrument to further validate the scale. A larger and more diverse sample will allow for further construct validation and the possibility of improved reliability measures. Another direction for future research is to adapt this scale to other types of athletic facilities. The current study only examined football stadiums. Adapting this survey for use in other specific outdoor stadiums (e.g. baseball, softball, soccer, lacrosse, tennis etc.) would require minimal changes and the resulting scale could be validated using the same methods as this study. This study could also be adapted for use with indoor competition facilities as well like those for basketball or volleyball. This would require the addition of indoor environmental quality measures to the scale before validation testing could occur. This scale could also be adapted for use in assessing student-athlete satisfaction with training and practice facilities, though it would require more in-depth modifications before validation testing could occur. As these training and practice facilities are typically used on a much greater basis than the competition facilities, their more continuous impact on student-athlete satisfaction may be vitally important.

Another direction for further testing and validation of this instrument is to test and validate the instrument for use by other primary users of the facilities. The current study only tested the instrument with student-athletes. Further testing would allow for the validation of the scale for use by coaches, officials, and facility managers in measuring their own satisfaction with stadium facilities. Information about the satisfaction of stadiums from the coaches, officials, and facility managers has many of the same uses as

information from the student-athletes. Areas they are unsatisfied with can be improved and areas they are satisfied with can be preserved. The most important implication to examining their satisfaction with stadium facilities is in comparing their satisfaction levels, particularly coaches' to student-athletes' satisfaction. Coaches are often asked to speak for their teams to administrators making important decisions. If coaches are viewing their facilities differently than their student-athletes, it is possible that flawed or incomplete information is being used to make decisions with significant impacts on the student-athletes.

Beyond further testing and validation of the scale, there are several other directions for future research that have significant theoretical implications. This scale can be used to explore associations between student-athlete satisfaction with their facilities and numerous other constructs. The first area for this type of research is with the student-athlete experience. As discussed earlier, there is a gap in the student-athlete experience literature when it come to the impact of facilities. It is common within the student-athlete experience literature for personal factors such as race (Cooper, 2016), gender (John, 2016), or sexual orientation (Fynes & Fisher, 2016) or institutional factors such as division affiliation (Becht, 2017) to be used as variables for the study. The built environment, particularly stadiums and other athletic facilities, however, has not been a variable examined by scholars to this point. This scale will allow for researchers to examine the association between facilities and the student-athlete experience and begin to fill in that gap. Another area for exploration is to examine the relationship between student-athlete satisfaction with their facilities and recruiting. The effect of facilities on recruiting has been studied by many researchers (Huml, Pifer, Towle, & Rode, 2018;

Magnusen, Kim, McAllister, Perrewe, & Ferris, 2017), but this research has been focused on facility characteristics rather than the opinions of the student-athletes. In addition to recruiting student-athletes, the relationship between student-athlete satisfaction with their facilities and the retention of student-athletes could also be examined. As the NCAA is in the process of relaxing its transfer rules, the ability of colleges to retain their student-athletes is going to become more of a priority (Johnson, 2018). The study of student-athlete retention has grown rapidly as transfers have increased in the last several years with sport participation (Hunter, 2015), and personal factors such as nationality (Battle, 2016), race and gender (Johnson, Wessel, & Pierce, 2013), and institutional division affiliation (Nash, 2017) being the common variables examined. Again, the impact of the built environment continues to be absent from the literature. This instrument provides researchers with a tool to begin filling this gap.

APPENDICES

APPENDIX A

Survey Instrument

Directions: This survey deals with your opinions of collegiate football stadiums and Stadium XYZ. For each survey item please compare your satisfaction with Stadium XYZ to your expectations for a college football stadium and choose the response that best describes your opinion.

Greatly Underperforms Expectations	Underperforms Expectations	Somewhat Underperforms Expectations	Meets Expectations	Somewhat Exceeds Expectations	Exceeds Expectations	Greatly Exceeds Expectations
1	2	3	4	5	6	7

	When compared to my expectations for a college football stadium…							
F 1*	The quality of the playing surface at Stadium XYZ…	1	2	3	4	5	6	7
F 2*	The maintenance of the playing surface at Stadium XYZ…	1	2	3	4	5	6	7
F 3*	The functionality of the lockers in Stadium XYZ…	1	2	3	4	5	6	7
F 4*	The quality of the lockers in Stadium XYZ…	1	2	3	4	5	6	7
F 5*	The maintenance of the lockers in Stadium XYZ…	1	2	3	4	5	6	7
F 6^	The quality of the restroom facilities in Stadium XYZ…	1	2	3	4	5	6	7
F 7^	The maintenance of the restroom facilities in Stadium XYZ…	1	2	3	4	5	6	7
F 8^	The quality of the shower facilities in Stadium XYZ…	1	2	3	4	5	6	7
F 9^	The maintenance of the shower facilities in Stadium XYZ…	1	2	3	4	5	6	7

F 10+	The size of our locker room in Stadium XYZ…	1	2	3	4	5	6	7
F 11+	The layout of our locker room in Stadium XYZ…	1	2	3	4	5	6	7
F 12+	The size of the athletic training room in Stadium XYZ…	1	2	3	4	5	6	7
F 13^	The availability of medical equipment in Stadium XYZ…	1	2	3	4	5	6	7
F 14^	The maintenance of the medical equipment in Stadium XYZ…	1	2	3	4	5	6	7
F 15+	The distance between our locker room and the playing field at Stadium XYZ…	1	2	3	4	5	6	7
F 16+	The condition of the route from our locker room to the playing field in Stadium XYZ…	1	2	3	4	5	6	7
F 17+	The distance between our locker room and the athletic training room at Stadium XYZ…	1	2	3	4	5	6	7
F 18+	The condition of the route from our locker room to the athletic training room in Stadium XYZ…	1	2	3	4	5	6	7
F 19+	The distance between the athletic training room and the playing field at Stadium XYZ…	1	2	3	4	5	6	7
F 20+	The condition of the route from the athletic training room to the playing field in Stadium XYZ…	1	2	3	4	5	6	7
F 21+	The distance between our locker room and the media room at Stadium XYZ…	1	2	3	4	5	6	7
F 22+	The condition of the route from our locker room to the media room in Stadium XYZ…	1	2	3	4	5	6	7
F 23+	The technology available in Stadium XYZ…	1	2	3	4	5	6	7
F 24+	The Wi-Fi connectivity in Stadium XYZ…	1	2	3	4	5	6	7
F 25+	The phone service in Stadium XYZ…	1	2	3	4	5	6	7
F 26+	The amount of general parking available at Stadium XYZ…	1	2	3	4	5	6	7
F 27+	The amount of parking available for players at Stadium XYZ…	1	2	3	4	5	6	7
F 28+	The amount of parking available for staff at Stadium XYZ…	1	2	3	4	5	6	7

F 29+	The amount of parking available for spectators at Stadium XYZ…	1	2	3	4	5	6	7
F 30+	My feelings of safety while in Stadium XYZ…	1	2	3	4	5	6	7
F 31*	My feelings of being free from unintentional harm such as slips or falls while in Stadium XYZ…	1	2	3	4	5	6	7
F 32*	My feelings of security while in Stadium XYZ…	1	2	3	4	5	6	7
F 33*	My feelings of being free from intentional acts of harm such as attacks while in Stadium XYZ…	1	2	3	4	5	6	7
A 34*	The lighting in Stadium XYZ…	1	2	3	4	5	6	7
A 35#	The size of the video board(s) in Stadium XYZ…	1	2	3	4	5	6	7
A 36#	The picture quality on the video board(s) in Stadium XYZ…	1	2	3	4	5	6	7
A 37#	The clarity of the sound through the PA system in Stadium XYZ…	1	2	3	4	5	6	7
A 38#	The volume of the sound through the PA system in Stadium XYZ…	1	2	3	4	5	6	7
A 39#	The noise level during games in Stadium XYZ…	1	2	3	4	5	6	7
A 40+	The spectator capacity of Stadium XYZ…	1	2	3	4	5	6	7
A 41#	The spectator attendance for our games in Stadium XYZ..	1	2	3	4	5	6	7
A 42+	The proximity of fans to the playing field in Stadium XYZ…	1	2	3	4	5	6	7
A 43#	The level of excitement during our games in Stadium XYZ…	1	2	3	4	5	6	7
V 44*	The architectural design of Stadium XYZ…	1	2	3	4	5	6	7
V 45+	The match of Stadium XYZ's style to the surrounding area (architecture, landscape, building materials, etc.)…	1	2	3	4	5	6	7
V 46+	The quality of the materials used to finish the floors, walls, and ceilings in Stadium XYZ…	1	2	3	4	5	6	7
V 47*	The visual appeal of the materials used to finish the floors, walls, and ceilings in Stadium XYZ…	1	2	3	4	5	6	7
V 48+	The color scheme of Stadium XYZ…	1	2	3	4	5	6	7

V 49+	The color scheme of our locker room in Stadium XYZ…	1	2	3	4	5	6	7
V 50+	The attractiveness of the decorations in Stadium XYZ…	1	2	3	4	5	6	7
V 51+	The appropriateness of the decorations in Stadium XYZ…	1	2	3	4	5	6	7
V 52^	The general cleanliness of Stadium XYZ…	1	2	3	4	5	6	7
V 53^	The cleanliness of our locker room in Stadium XYZ…	1	2	3	4	5	6	7
V 54^	The cleanliness of the athletic training room in Stadium XYZ…	1	2	3	4	5	6	7
D 55	For how many seasons have you been a member of the football team at your current university?	1	2	3	4	5		
D 56	Which of the following best describes your playing time?	Starter Reserve with significant playing time Reserve with limited playing time Scout team/no playing time						
D 57	What is your race?	White African American Asian/Pacific Islander				Hispanic Native American Other		

* - Developed from Parasauraman, Zeithaml, & Berry, 1988

^ - Developed from Teng, Ing, Chang, & Chung, 2007

- Developed from Chen, Lin, & Chiu, 2013

+ - Self-developed based upon facility performance indicators

APPENDIX B

Survey Question Descriptive Statistics

Item	Var	*N*	*M*	*SD*
The quality of the playing surface at Stadium XYZ…	V1	778	4.90	1.412
The maintenance of the playing surface at Stadium XYZ…	V2	777	5.00	1.356
The functionality of the lockers in Stadium XYZ…	V3	775	4.41	1.623
The quality of the lockers in Stadium XYZ…	V4	776	4.25	1.712
The maintenance of the lockers in Stadium XYZ…	V5	776	4.54	1.542
The quality of the restroom facilities in Stadium XYZ…	V6	774	4.37	1.394
The maintenance of the restroom facilities in Stadium XYZ…	V7	778	4.51	1.403
The quality of the shower facilities in Stadium XYZ…	V8	774	4.03	1.471
The maintenance of the shower facilities in Stadium XYZ…	V9	774	4.19	1.489
The size of our locker room in Stadium XYZ…	V10	776	4.22	1.620
The layout of our locker room in Stadium XYZ…	V11	777	4.23	1.512
The size of the athletic training room in Stadium XYZ…	V12	779	3.99	1.623
The availability of medical equipment in Stadium XYZ…	V13	775	4.48	1.560
The condition of the route from our locker room to the playing field in Stadium XYZ…	V14	774	4.65	1.452
The distance between our locker room and the playing field in Stadium XYZ…	V15	777	5.27	1.507
The condition of the route from our locker room to the playing field in Stadium XYZ…	V16	775	5.02	1.527
The distance between our locker room and the athletic training room in Stadium XYZ…	V17	776	5.15	1.582
The condition of the route from our locker room to the athletic training room in Stadium XYZ…	V18	776	5.02	1.522

Item	Var	*N*	*M*	*SD*
The distance between the athletic training room and the playing field in Stadium XYZ…	V19	776	4.97	1.564
The condition of the route from the athletic training room to the playing field in Stadium XYZ…	V20	778	4.79	1.430
The distance between our locker room and the media room in Stadium XYZ…	V21	767	4.36	1.377
The condition of the route from our locker room to the media room in Stadium XYZ…	V22	765	4.34	1.333
The technology available in Stadium XYZ…	V23	771	3.93	1.586
The Wi-Fi connectivity in Stadium XYZ…	V24	777	3.56	1.759
The phone service in Stadium XYZ…	V25	774	3.81	1.615
The amount of general parking available at Stadium XYZ…	V26	775	3.59	1.648
The amount of parking available for players at Stadium XYZ…	V27	773	3.49	1.695
The amount of parking available for staff at Stadium XYZ…	V28	775	3.93	1.505
The amount of parking available for spectators at Stadium XYZ…	V29	774	3.78	1.566
My feelings of safety while in Stadium XYZ…	V30	774	4.91	1.363
My feelings of being free from unintentional harm such as slips or falls while in Stadium XYZ…	V31	776	4.76	1.353
My feelings of security while in Stadium XYZ…	V32	773	4.78	1.359
My feelings of being free from intentional acts of harm such as physical attacks while in Stadium XYZ…	V33	775	4.86	1.354
The lighting in Stadium XYZ…	V34	775	4.83	1.300
The size of the video board(s) in Stadium XYZ…	V35	776	4.11	1.722
The picture quality on the video board(s) in Stadium XYZ…	V36	770	4.01	1.712
The clarity of the sound through the PA system in Stadium XYZ…	V37	771	4.32	1.515
The volume of the sound through the PA system in Stadium XYZ…	V38	774	4.41	1.480
The noise level during games in Stadium XYZ…	V39	776	4.02	1.587
The spectator capacity of Stadium XYZ…	V40	774	3.93	1.459

Item	Var	*N*	*M*	*SD*
The spectator attendance for our games in Stadium XYZ…	V41	773	3.79	1.627
The proximity of fans to the playing field in Stadium XYZ…	V42	776	4.12	1.323
The level of excitement during our games in Stadium XYZ…	V43	774	4.13	1.519
The architectural design of Stadium XYZ…	V44	774	4.30	1.546
The matching of Stadium XYZ's style to the surrounding area (architecture, landscape, building materials, etc.) …	V45	775	4.49	1.455
The quality of the materials used to finish the floors, walls, and ceilings in Stadium XYZ…	V46	773	4.40	1.400
The visual appeal of the materials used to finish the floors, walls, and ceilings in Stadium XYZ…	V47	772	4.38	1.445
The color scheme of Stadium XYZ…	V48	772	4.62	1.420
The color scheme of our locker room in Stadium XYZ…	V49	773	4.46	1.460
The attractiveness of the decorations in Stadium XYZ…	V50	774	4.31	1.488
The appropriateness of the decorations in Stadium XYZ…	V51	773	4.43	1.417
The general cleanliness of Stadium XYZ…	V52	775	4.69	1.430
The cleanliness of our locker room in Stadium XYZ…	V53	775	4.62	1.494
The cleanliness of the athletic training room in Stadium XYZ…	V54	773	4.93	1.485

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